Safety Notices

This Manual contains information which you must observe to ensure your own personal safety as well as to avoid material damage. The notices referring to your personal safety are highlighted in the manual by a warning triangle; notices that relate to material damage only have no warning triangle. The notices shown below are graded according to the level of danger (from most to least hazardous):

**Danger**
Indicates that death or serious injury **will** result if proper precautions are not taken.

**Warning**
Indicates that death or serious injury **may** result if proper precautions are not taken.

**Caution**
With a warning triangle, indicates that minor injury **may** result if proper precautions are not taken.

**Caution**
Without a warning triangle, indicates that material damage may result if proper precautions are not taken.

**Notice**
Indicates that an undesirable result or state may occur if the corresponding instructions are not observed.

If more than one level of hazard exists, the warning for the highest hazard level is always used. A warning on a warning triangle indicating possible personal injury may also include a warning relating to material damage.

Qualified Personnel

The associated device/system may only be installed and operated in conjunction with this documentation. The equipment/system may only be commissioned and operated by **qualified personnel**. For the purpose of the safety information in this documentation, a "qualified person" is someone who is authorized to energize, ground, and tag equipment, systems, and circuits in accordance with established safety procedures.

Proper Use of Siemens Products

Please observe the following:

**Warning**
Siemens products are only permitted to be used for the applications envisaged in the catalog and in the associated technical documentation. If third-party products and components are to be used, they must be recommended or approved by Siemens. To ensure proper and safe operation of these products, they must be correctly transported, stored, set up, mounted, installed, commissioned, operated, and maintained. The permissible ambient conditions must be met. Information in the associated documentation must be observed.

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Industry Sector
Postfach 4848
90327 NÜRNBERG
GERMANY

Liability Disclaimer

We have checked that the contents of this document correspond to the hardware and software described. Nevertheless, we cannot assume responsibility for any deviations that may arise. The data in this document is regularly checked and any necessary corrections included in subsequent editions.

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Preface

SINAMICS documentation

The SINAMICS documentation is organized in the following categories:

- General documentation/catalogs
- Manufacturer/service documentation

More information

Information on the following topics is available under the link:

- Ordering documentation/overview of documentation
- Additional links to download documents
- Using documentation online (find and search in manuals/information).

http://www.siemens.com/motioncontrol/docu

Please send any questions about the technical documentation (e.g. suggestions for improvement, corrections) to the following e-mail address:

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Training

Information about SITRAIN (Siemens Training on products, systems and solutions for automation) is available under the following link:

http://www.siemens.com/sitrain

FAQs

You can find Frequently Asked Questions in the Service&Support pages under Product Support:

http://support.automation.siemens.com
**SINAMICS**

You can find information on SINAMICS at:

http://www.siemens.com/sinamics

**Usage phases and their tools/documents (as an example)**

Table Preface-1 Usage phases and the available tools/documents

<table>
<thead>
<tr>
<th>Usage phase</th>
<th>Tools/documents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orientation</td>
<td>SINAMICS S Sales Documentation</td>
</tr>
<tr>
<td>Planning/configuration</td>
<td>SIZER configuration tool</td>
</tr>
<tr>
<td></td>
<td>Configuration Manuals, Motors</td>
</tr>
<tr>
<td>Decision making/ordering</td>
<td>SINAMICS S Catalogs</td>
</tr>
<tr>
<td>Installation/assembly</td>
<td>• SINAMICS S120 Equipment Manual for Control Units and Additional System Components</td>
</tr>
<tr>
<td></td>
<td>• SINAMICS S120 Equipment Manual for Booksizne Power Units</td>
</tr>
<tr>
<td></td>
<td>• SINAMICS S120 Equipment Manual for Chassis Power Units</td>
</tr>
<tr>
<td></td>
<td>• SINAMICS S150 Operating Instructions</td>
</tr>
<tr>
<td>Commissioning</td>
<td>• STARTER commissioning tool</td>
</tr>
<tr>
<td></td>
<td>• SINAMICS S120 Getting Started</td>
</tr>
<tr>
<td></td>
<td>• SINAMICS S120 Commissioning Manual</td>
</tr>
<tr>
<td></td>
<td>• SINAMICS S120 CANopen Commissioning Manual</td>
</tr>
<tr>
<td></td>
<td>• SINAMICS S120 Function Manual</td>
</tr>
<tr>
<td></td>
<td>• SINAMICS S120/S150 List Manual</td>
</tr>
<tr>
<td></td>
<td>• SINAMICS S150 Operating Instructions</td>
</tr>
<tr>
<td>Usage/operation</td>
<td>• SINAMICS S120 Commissioning Manual</td>
</tr>
<tr>
<td></td>
<td>• SINAMICS S120/S150 List Manual</td>
</tr>
<tr>
<td></td>
<td>• SINAMICS S150 Operating Instructions</td>
</tr>
<tr>
<td>Maintenance/servicing</td>
<td>• SINAMICS S120 Commissioning Manual</td>
</tr>
<tr>
<td></td>
<td>• SINAMICS S120/S150 List Manual</td>
</tr>
<tr>
<td></td>
<td>• SINAMICS S150 Operating Instructions</td>
</tr>
</tbody>
</table>

**Target group**

This documentation is aimed at machine manufacturers, commissioning engineers, and service personnel who use SINAMICS.
Benefits

This documentation contains the comprehensive information about parameters, function diagrams and faults and alarms required to commission and service the system.

This manual should be used in addition to the other manuals and tools provided for the product.

Standard scope

The scope of the functionality described in this document can differ from the scope of the functionality of the drive system that is actually supplied.

- Other functions not described in this documentation might be able to be executed in the drive system. This does not, however, represent an obligation to supply such functions with a new control or when servicing.

- The documentation can also contain descriptions of functions that are not available in a particular product version of the drive system. The functionalities of the supplied drive system should only be taken from the ordering documentation.

- Extensions or changes made by the machine manufacturer must be documented by the machine manufacturer.

For reasons of clarity, this documentation does not contain all of the detailed information on all of the product types. This documentation cannot take into consideration every conceivable type of installation, operation and service/maintenance.

Search tools

The following guides are provided to help you locate information in this manual:

1. Table of contents
   - General table of contents for the complete manual (after the preface).
   - Table of contents for function diagrams (Chapter 2.1).

2. List of abbreviations

3. Index (Index)

Technical Support

Country-specific telephone numbers for technical support are provided on the Internet at:

http://www.siemens.com/automation/service&support

EC Declaration of Conformity

The EC Declaration of Conformity for the EMC Directive can be found on the Internet at:

http://support.automation.siemens.com

There, as the search term, enter the number 15257461 or contact your local Siemens office.
# Table of contents

## 1 Parameter

1 Overview of parameters .................................................. 1-12
1.1 Explanation of list of parameters ................................. 1-12
1.2 Number ranges of parameters ........................................... 1-26
1.3 List of parameters ...................................................... 1-29
1.3.1 Parameters for data sets ............................................ 1-733
1.3.2 Parameters for command data sets (CDS) ...................... 1-733
1.3.3 Parameters for drive data sets (DDS) ........................... 1-735
1.3.4 Parameters for encoder data sets (EDS) ....................... 1-739
1.3.5 Parameters for motor data sets (MDS) .......................... 1-741
1.3.6 Parameters for power unit data sets (PDS) ................. 1-743

## 2 Function diagrams

2 Table of contents .......................................................... 2-745
2.1 Table of contents ...................................................... 2-746
2.2 Explanations on the function diagrams ............................ 2-753
2.3 Overviews .............................................................. 2-758
2.4 CU305 input/output terminals ....................................... 2-768
2.5 PROFIdrive ............................................................ 2-776
2.6 Internal control/status words ....................................... 2-813
2.7 Sequence control ..................................................... 2-826
2.8 Brake control .......................................................... 2-829
2.9 Safety Integrated ...................................................... 2-834
2.10 Setpoint channel ...................................................... 2-853
2.11 Setpoint channel not activated ................................. 2-862
2.12 Basic positioner (EPOS) ............................................. 2-864
2.13 Position control ...................................................... 2-880
2.14 Encoder evaluation ................................................... 2-885
2.15 Servo control .......................................................... 2-892
2.16 Technology functions .................................................. 2-912
2.17 Free function blocks (FBLOCKS) ................................. 2-915
2.18 Technology controller ................................................. 2-933
2.19 Signals and monitoring functions ................................. 2-938
2.20 Diagnostics ............................................................. 2-944
2.21 Data sets ............................................................... 2-950
# Table of contents

2.22 CANopen interface ........................................... 2-955  
2.23 Basic Operator Panel 20 (BOP20) .......................... 2-962  

3 Faults and alarms ................................................. 3-965  
3.1 Overview of faults and alarms .............................. 3-966  
3.1.1 General information on faults and alarms ................ 3-966  
3.1.2 Explanation of the list of faults and alarms .......... 3-970  
3.1.3 Number ranges of faults and alarms ................... 3-973  
3.2 List of faults and alarms .................................. 3-975  

A Appendix ......................................................... A-1237  
A.1 ASCII table (excerpt) ..................................... A-1238  
A.2 List for motor code/encoder code ......................... A-1239  
A.2.1 Motor code ............................................. A-1239  
A.2.2 Encoder code ........................................... A-1260  

B List of abbreviations ......................................... B-1263  

C Index ............................................................. C-1273
## Parameter

### Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 Overview of parameters</td>
<td>1-12</td>
</tr>
<tr>
<td>1.2 List of parameters</td>
<td>1-29</td>
</tr>
<tr>
<td>1.3 Parameters for data sets</td>
<td>1-733</td>
</tr>
</tbody>
</table>
1.1 Overview of parameters

1.1.1 Explanation of list of parameters

Basic structure of parameter descriptions

The data in the following example has been chosen at random. The table below contains all the information that can be included in a parameter description. Some of the information is optional.

The parameter list (See Chapter 1.2) is structured as follows:

<table>
<thead>
<tr>
<th>Drive object (function module)</th>
<th>Calculated:</th>
<th>Access level:</th>
<th>Function diagram:</th>
</tr>
</thead>
<tbody>
<tr>
<td>pxxx[0...n] BICO: Full parameter name/Abbreviated name</td>
<td>CALC_MOD_REG</td>
<td>2</td>
<td>2080</td>
</tr>
<tr>
<td>Can be changed:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C1(x), C2(x), U, T</td>
<td>Dynamic index:</td>
<td>Unit group:</td>
<td>Unit selection:</td>
</tr>
<tr>
<td>Data type:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unsigned32/Integer16</td>
<td>CDS, p0170</td>
<td>7_1</td>
<td>p0505</td>
</tr>
<tr>
<td>P group:</td>
<td></td>
<td>Scaling:</td>
<td>Expert list:</td>
</tr>
<tr>
<td>Control</td>
<td></td>
<td>p2000</td>
<td>1</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FEM</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.00 [Nm]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Description:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Text</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Values:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0: Name and meaning of value 0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1: Name and meaning of value 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2: Name and meaning of value 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>etc.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recommendation:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Text</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Index:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[0] = Name and meaning of index 0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[1] = Name and meaning of index 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[2] = Name and meaning of index 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>etc.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bit array:</td>
<td>Bit</td>
<td>Signal name</td>
<td>1 signal</td>
</tr>
<tr>
<td>00</td>
<td>Name and meaning of bit 0</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>01</td>
<td>Name and meaning of bit 1</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>02</td>
<td>Name and meaning of bit 2</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>etc.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dependency:</td>
<td>Text</td>
<td></td>
<td></td>
</tr>
<tr>
<td>See also: pxxxx, rxxxx</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>See also: Fxxxxx, Axxxxx</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Danger:</td>
<td>WARNING:</td>
<td>Caution:</td>
<td>Safety notices with a warning triangle</td>
</tr>
<tr>
<td>Caution:</td>
<td>Notice:</td>
<td></td>
<td>Safety notices without a warning triangle</td>
</tr>
<tr>
<td>Note:</td>
<td>Information which might be useful</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Parameter number

The parameter number is made up of a "p" or "r", followed by the parameter number and the index (optional).

Examples of number representation in the parameter list:
- p...  Adjustable parameter (read and write parameter)
- r...  Display parameters (read-only)
- p0918  Adjustable parameter 918
- p0099[0...3]  Adjustable parameter 99, indices 0 to 3
- p1001[0...n]  Adjustable parameter 1001, indices 0 to n (n = configurable)
- r0944  Display parameter 944

Other examples of the notation used in the documentation:
- p1070[1]  Adjustable parameter 1070, index 1
- p2098[1].3  Adjustable parameter 2098, index 1 bit 3
- r0945[2](3)  Display parameter 945, index 2 of drive object 3
- p0795.4  Adjustable parameter 795, bit 4
- r2129.0...15  Display parameter 2129 with bit array (maximum 16 bits)

The following applies to adjustable parameters:
The parameter value "when shipped" is specified under "Factory setting" with the relevant unit in square parentheses. The value can be adjusted within the range defined by "Min" and "Max".

The term "linked parameterization" is used in cases where changes to adjustable parameters affect the settings of other parameters.

Linked parameterization can occur, for example, as a result of the following actions or parameters:
- Execution of macros
  p0015, p0700, p1000, p1500
- Setting PROFIBUS telegram (BICO interconnection)
  p0922
- Setting component lists
  p0230, p0300, p0301, p0400
- Automatic calculation and pre-assignment
  p0340, p0578, p3900
- Restoring factory settings
  p0970

The following applies to display parameters:
The fields "Min", "Max" and "Factory setting" are specified with a dash "-" and the relevant unit in square parentheses.
Overview of parameters

Note:
The parameter list can contain parameters that are not visible in the expert lists of the particular commissioning software (e.g. parameters for trace functions).

BICO: Full parameter name/Abbreviated name

The following abbreviations can appear in front of the parameter name:

- **BI**: Binector Input
  This parameter is used for selecting the source of a digital signal.

- **BO**: Binector Output
  This parameter is available as a digital signal for interconnection with other parameters.

- **CI**: Connector Input
  This parameter is used for selecting the source of an “analog” signal.

- **CO**: Connector Output
  This parameter is available as an “analog” signal for interconnection with other parameters.

- **CO/BO**: Connector/Binector Output
  This parameter is available as an “analog” and digital signal for interconnection with other parameters.

Note:
A connector input (CI) cannot be just interconnected with any connector output (CO, signal source). When interconnecting a connector input using the commissioning software, only the corresponding possible signal sources are listed.

Drive object (function module)

A drive object (DO) is an independent, "self-contained" functional unit that has its own parameters and, in some cases, faults and alarms.

When carrying out commissioning using the commissioning software, you can select/deselect additional functions and their parameters by activating/deactivating function modules accordingly.

Note:

The parameter list specifies the associated drive object and function module for each individual parameter.
Example:

- p1070 CI: Main setpoint
  - SERVO_S110 (ext setp)
  
  This parameter is available only for the SERVO_S110 drive object in conjunction with the "Extended setpoint channel" function module.

A parameter can belong to a single, multiple, or all drive objects.

The following information relating to "Drive object" and "Function module" can be displayed under the parameter number:

<table>
<thead>
<tr>
<th>Drive object (function module)</th>
<th>Type</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>All objects</td>
<td>-</td>
<td>All drive objects have this parameter.</td>
</tr>
<tr>
<td>CU</td>
<td>-</td>
<td>Control Unit, all versions.</td>
</tr>
<tr>
<td>CU_S110-CAN</td>
<td>1</td>
<td>Control Unit S110 with CAN interface.</td>
</tr>
<tr>
<td>CU_S110-DP</td>
<td>1</td>
<td>Control Unit S110 with PROFIBUS DP interface.</td>
</tr>
<tr>
<td>SERVO_S110-CAN</td>
<td>11</td>
<td>S110 servo drive.</td>
</tr>
<tr>
<td>SERVO_S110-DP</td>
<td></td>
<td>S110 servo drive with &quot;Position control&quot; function module (r0108.3).</td>
</tr>
<tr>
<td>SERVO_S110-CAN (pos ctrl)</td>
<td></td>
<td>S110 servo drive with &quot;Basic positioner&quot; function module (r0108.4).</td>
</tr>
<tr>
<td>SERVO_S110-CAN (EPOS)</td>
<td></td>
<td>S110 servo drive with &quot;Extended setpoint channel&quot; function module (r0108.8).</td>
</tr>
<tr>
<td>SERVO_S110-DP (pos ctrl)</td>
<td></td>
<td>S110 servo drive with &quot;Safety rotary axis&quot; function module (r0108.13).</td>
</tr>
<tr>
<td>SERVO_S110-DP (EPOS)</td>
<td></td>
<td>S110 servo drive with &quot;Extended brake control&quot; function module (r0108.14).</td>
</tr>
<tr>
<td>SERVO_S110-CAN (extend. setp)</td>
<td></td>
<td>S110 servo drive with &quot;Technology controller&quot; function module (r0108.16).</td>
</tr>
<tr>
<td>SERVO_S110-DP (extend. setp)</td>
<td></td>
<td>S110 servo drive with &quot;Extended messages/monitoring functions&quot; function module (r0108.17).</td>
</tr>
<tr>
<td>SERVO_S110-CAN (ext brake)</td>
<td></td>
<td>S110 servo drive with &quot;Free function blocks&quot; function module (r0108.18).</td>
</tr>
</tbody>
</table>

Note:

The drive object type is used to identify the drive objects in the drive system (e.g. r0107, r0975[1]).
Can be changed

The "-" sign indicates that the parameter can be changed in any object state and that the change will be effective immediately.

The information "C1(x), C2(x), T, U" ((x): optional) mean that the parameter can be changed only in the specified drive object state and that the change will not take effect until the object switches to another state. This can be a single or multiple states.

The following states may be specified:

- **C1(x)** Device commissioning  
  **C1: Commissioning 1**
  Device commissioning is in progress (p0009 > 0).

  Pulses cannot be enabled.

  The parameter can only be changed when the device commissioning settings (p0009 > 0) are as follows:
  - **C1**: Can be changed for all settings p0009 > 0
  - **C1(x)**: Can only be changed when the settings are p0009 = x

  A modified parameter value does not take effect until converter commissioning mode is exited with p0009 = 0.

- **C2(x)** Drive object commissioning  
  **C2: Commissioning 2**
  Drive commissioning is in progress (p0009 = 0 and p0010 > 0).

  Pulses cannot be enabled.

  The parameter can only be changed when the drive commissioning settings (p0010 > 0) are as follows:
  - **C2**: Can be changed for all settings p0010 > 0
  - **C2(x)**: Can only be changed when p0010 = x

  A modified parameter value does not take effect until drive commissioning mode is exited with p0010 = 0.

- **U** Operation  
  **U: Run**
  Pulses are enabled.

- **T** Ready for operation  
  **T: Ready to run**
  The pulses are not enabled and the status "C1(x)" oder "C2(x)" is not active.

---

**Note:**

Parameter p0009 is CU-specific (present on Control Unit).

Parameter p0010 is drive-specific (present for each drive object).

The operating state of individual drive objects is displayed in r0002.
Calculated

Specifies whether the parameter is influenced by automatic calculations. The calculation attribute defines which activities influence the parameter. The following attributes apply:

- **CALC_MOD_ALL**
  - p0340 = 1
  - Project download with commissioning software and send from p0340 = 3
- **CALC_MOD_CON**
  - p0340 = 1, 3, 4
- **CALC_MOD_EQU**
  - p0340 = 1, 2
- **CALC_MOD_LIM_REF**
  - p0340 = 1, 3, 5
  - p0578 = 1
- **CALC_MOD_REG**
  - p0340 = 1, 3

**Note:**
For p3900 > 0, p0340 = 1 is also called automatically.
After p1910 = 1, p0340 = 3 is also called automatically.

Access level

Specifies the access level required to be able to display and change the relevant parameter. The required access level can be set via p0003.

The system uses the following access levels:

1. Standard
2. Extended
3. Expert
4. Service
   Parameters with this access level are password protected.

**Note:**
Parameter p0003 is CU-specific (present on Control Unit).
## Data type

The information on the data type can consist of the following two items (separated by a slash):

- **First item**
  - Data type of the parameter
- **Second item (for binector or connector input only)**
  - Data type of the signal source to be interconnected (binector/connector output)

Parameters can have the following data types:

- **I8** Integer8 8-bit integer
- **I16** Integer16 16-bit integer
- **I32** Integer32 32-bit integer
- **U8** Unsigned8 8 bits without sign
- **U16** Unsigned16 16 bits without sign
- **U32** Unsigned32 32 bits without sign
- **Float** FloatingPoint32 32-bit floating point number

Depending on the data type of the BICO input parameter (signal sink) and BICO output parameter (signal source), the following combinations are possible when BICO interconnections are established:

### Table 1-2 Possible combinations of BICO interconnections

<table>
<thead>
<tr>
<th>BICO output parameter</th>
<th>CI parameter</th>
<th>BI parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unsigned32/Integer16</td>
<td>Unsigned32/Integer32</td>
</tr>
<tr>
<td>CO: Unsigned8</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>CO: Unsigned16</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>CO: Integer16</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>CO: Unsigned32</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>CO: Integer32</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>CO: FloatingPoint32</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>BO: Unsigned8</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>BO: Unsigned16</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

Legend:
- **x**: BICO interconnection permitted
- **–**: BICO interconnection not permitted

\(^1\) Exception:

BICO input parameters with data type "Unsigned32/FloatingPoint32" can also be interconnected with the following BICO output parameters, despite the fact that these are not of the "FloatingPoint32" data type:

- CO: r2050, CO: r2060
Dynamic index

For parameters with a dynamic index [0...n], the following information is specified here:

- Data set (if available).
- Parameter for the number of indices \( (n = \text{number} - 1) \).

This field can contain the following information:

- "CDS, p0170" (Command Data Set, CDS count)
  
  Example:
  
  \[
  p1070[0] \rightarrow \text{main setpoint [command data set 0]}
  
  p1070[1] \rightarrow \text{main setpoint [command data set 1]}, \text{etc.}
  \]

- "DDS, p0180" (Drive Data Set, DDS count)
- "EDS, p0140" (Encoder Data Set, EDS count)
- "MDS, p0130" (Motor Data Set, MDS count)
- "PDS, p0120" (Power unit Data Set, PDS count)
- "p2615" (traversing blocks count)

Note:

Information on the data sets can be taken from the following references:

Chapter "Data Sets"
**Overview of parameters**

**Function diagram**

The parameter is included in this function diagram. The structure of the parameter function and its relationship with other parameters is shown in the specified function diagram.

**Example:**

Function diagram: 3060.3  
3060: Function diagram number  
3: Signal path (optional)

**P group (refers only to access via BOP (Basic Operator Panel))**

Specifies the functional group to which the parameter belongs. The required parameter group can be set via p0004.

**Note:**

Parameter p0004 is CU-specific (present on Control Unit).

"Unit", "Unit group", and "Unit selection"

The standard unit of a parameter is specified in square parentheses after the values for "Min", "Max", and "Factory setting".

For parameters where the unit can be changed, the specifications for "Unit group" and "Unit selection" determine the group to which this parameter belongs and with which parameter the unit can be changed over.

**Example:**

Unit group: 7_1, unit selection: p0505

The parameter belongs to unit group 7_1 and the unit can be changed over using p0505.

**Note:**

Detailed information on changing over units can be found in the following references:

References: /FH3/ SINAMICS S110 Function Manual Drive Functions

All the potential unit groups and possible unit selections are listed below.

**Table 1-3 Unit groups (p0100)**

<table>
<thead>
<tr>
<th>Unit group</th>
<th>Unit selection for p0100</th>
<th>Reference variable for %</th>
</tr>
</thead>
<tbody>
<tr>
<td>7_4</td>
<td>Nm</td>
<td>lbf ft</td>
</tr>
<tr>
<td>8_4</td>
<td>N</td>
<td>lbf</td>
</tr>
<tr>
<td>14_2</td>
<td>W</td>
<td>HP</td>
</tr>
</tbody>
</table>
Table 1-3  Unit groups (p0100), continued

<table>
<thead>
<tr>
<th>Unit group</th>
<th>Unit selection for p0100 =</th>
<th>Reference variable for %</th>
</tr>
</thead>
<tbody>
<tr>
<td>14_6</td>
<td>kW</td>
<td>HP</td>
</tr>
<tr>
<td>25_1</td>
<td>kgm²</td>
<td>lb ft²</td>
</tr>
<tr>
<td>27_1</td>
<td>kg</td>
<td>lb</td>
</tr>
<tr>
<td>28_1</td>
<td>Nm/A</td>
<td>lbf ft/A</td>
</tr>
<tr>
<td>29_1</td>
<td>N/Arms</td>
<td>lbf/Arms</td>
</tr>
<tr>
<td>30_1</td>
<td>m</td>
<td>ft</td>
</tr>
</tbody>
</table>

Table 1-4  Unit groups (p0349)

<table>
<thead>
<tr>
<th>Unit group</th>
<th>Unit selection for p0349 =</th>
<th>Reference variable for %</th>
</tr>
</thead>
<tbody>
<tr>
<td>15_1</td>
<td>mH</td>
<td>%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16_1</td>
<td>Ohm</td>
<td>%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 1-5  Unit groups (p0505)

<table>
<thead>
<tr>
<th>Unit group</th>
<th>Unit selection for p0505 =</th>
<th>Reference variable for %</th>
</tr>
</thead>
<tbody>
<tr>
<td>2_1</td>
<td>Hz</td>
<td>%</td>
</tr>
<tr>
<td>2_2</td>
<td>kHz</td>
<td>%</td>
</tr>
<tr>
<td>3_1</td>
<td>rpm</td>
<td>%</td>
</tr>
<tr>
<td>4_1</td>
<td>m/min</td>
<td>%</td>
</tr>
<tr>
<td>4_2</td>
<td>m/min m/min</td>
<td>ft/min ft/min</td>
</tr>
<tr>
<td>5_1</td>
<td>Vrms</td>
<td>%</td>
</tr>
<tr>
<td>5_2</td>
<td>V</td>
<td>%</td>
</tr>
<tr>
<td>5_3</td>
<td>V</td>
<td>%</td>
</tr>
<tr>
<td>6_1</td>
<td>mArms</td>
<td>%</td>
</tr>
<tr>
<td>6_2</td>
<td>Arms</td>
<td>%</td>
</tr>
<tr>
<td>6_3</td>
<td>mA</td>
<td>%</td>
</tr>
<tr>
<td>6_4</td>
<td>A</td>
<td>%</td>
</tr>
<tr>
<td>6_5</td>
<td>A</td>
<td>%</td>
</tr>
<tr>
<td>7_1</td>
<td>Nm</td>
<td>%</td>
</tr>
<tr>
<td>7_2</td>
<td>Nm</td>
<td>Nm lbf ft lbf ft</td>
</tr>
</tbody>
</table>
### Table 1-5  Unit groups (p0505), continued

<table>
<thead>
<tr>
<th>Unit group</th>
<th>Unit selection for p0505 =</th>
<th>Reference variable for %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>7_3 Nm</td>
<td>%</td>
<td>lbf</td>
</tr>
<tr>
<td>8_1 N</td>
<td>%</td>
<td>lbf</td>
</tr>
<tr>
<td>8_2 N</td>
<td>N</td>
<td>lbf</td>
</tr>
<tr>
<td>8_3 N</td>
<td>%</td>
<td>lbf</td>
</tr>
<tr>
<td>14_1 W</td>
<td>%</td>
<td>HP</td>
</tr>
<tr>
<td>14_3 W</td>
<td>%</td>
<td>HP</td>
</tr>
<tr>
<td>14_4 W</td>
<td>%</td>
<td>HP</td>
</tr>
<tr>
<td>14_5 kW</td>
<td>%</td>
<td>HP</td>
</tr>
<tr>
<td>14_7 kW</td>
<td>%</td>
<td>HP</td>
</tr>
<tr>
<td>14_8 kW</td>
<td>%</td>
<td>HP</td>
</tr>
<tr>
<td>14_9 W</td>
<td>W</td>
<td>W</td>
</tr>
<tr>
<td>14_10 kW</td>
<td>kW</td>
<td>kW</td>
</tr>
<tr>
<td>14_11 var</td>
<td>%</td>
<td>var</td>
</tr>
<tr>
<td>14_12 kvar</td>
<td>%</td>
<td>kvar</td>
</tr>
<tr>
<td>17_1 Nms/rad</td>
<td>%</td>
<td>lbf</td>
</tr>
<tr>
<td>18_1 V/A</td>
<td>%</td>
<td>V/A</td>
</tr>
<tr>
<td>19_1 A/V</td>
<td>%</td>
<td>A/V</td>
</tr>
<tr>
<td>21_1 °C</td>
<td>°C</td>
<td>°F</td>
</tr>
<tr>
<td>21_2 K</td>
<td>K</td>
<td>°F</td>
</tr>
<tr>
<td>22_1 m/s²</td>
<td>m/s²</td>
<td>ft/s²</td>
</tr>
<tr>
<td>22_2 m/s³</td>
<td>%</td>
<td>ft/s²</td>
</tr>
<tr>
<td>23_1 Vrms</td>
<td>s/m</td>
<td>Vrms</td>
</tr>
<tr>
<td>24_1 Ns/m</td>
<td>Ns/m</td>
<td>lbf</td>
</tr>
<tr>
<td>24_2 Ns/m</td>
<td>%</td>
<td>lbf</td>
</tr>
<tr>
<td>26_1 m³/s</td>
<td>m³/s</td>
<td>ft³/s</td>
</tr>
<tr>
<td>39_1 1/s^2</td>
<td>%</td>
<td>1/s²</td>
</tr>
</tbody>
</table>

### Table 1-6  Unit group (p0595)

<table>
<thead>
<tr>
<th>Unit group</th>
<th>Unit selection for p0595 =</th>
<th>Reference variable for %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Value</td>
<td>Unit</td>
</tr>
<tr>
<td>9_1</td>
<td>The values that can be set and the technological units are shown in p0595 (See Chapter 1.2).</td>
<td></td>
</tr>
</tbody>
</table>
Parameter values

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min</td>
<td>Minimum value of the parameter [unit]</td>
</tr>
<tr>
<td>Max</td>
<td>Maximum value of the parameter [unit]</td>
</tr>
<tr>
<td>Factory setting</td>
<td>Value when shipped [unit]</td>
</tr>
</tbody>
</table>

A different value may be displayed for certain parameters (e.g. p1800) at the initial commissioning stage. Reason: The setting of these parameters is determined by the operating environment of the Control Unit (e.g. depending on converter type, macro, power unit).

Not for motor type

Specifies for which motor type this parameter has no significance

- ASM: Induction motor
- FEM: Separately excited synchronous motor
- PEM: Permanent-magnet synchronous motor
- REL: Reluctance motor/SIEMOSYN motor

Scaling

Specification of the reference variable with which a signal value is automatically converted for a BICO interconnection.

The following reference variables are available:

- p2000 ... p2007: Reference speed, reference voltage, etc.
- PERCENT: 1.0 = 100 %
- 4000H: 4000 hex = 100 %

Expert list

Specifies whether this parameter is available in the expert list of the specified drive objects in the commissioning software.

- 1: Parameter does exist in the expert list.
- 0: Parameter does not exist in the expert list.

Notice:

Users are responsible for using parameters that are marked “Expert list: 0” (parameter not included in the expert list).

These parameters and their functionalities have not been tested and no further user documentation is available for them (e.g. description of functions). Moreover, no support is provided for these parameters by "Technical Support" (hotline).
Parameter

Overview of parameters

Description
Explanation of the function of a parameter.

Values
Lists the possible values of a parameter.

Recommendation
Information about recommended settings.

Index
The name and meaning of each individual index is specified for indexed parameters.
The following applies to the values (Min, Max, Factory setting) of indexed adjustable parameters:
• Min, Max:
The adjustment range and unit apply to all indices.
• Factory setting:
When all indices have the same factory setting, index 0 is specified with the unit to represent all indices.
When the indices have different factory settings, they are all listed individually with the unit.

Bit array
For parameters with bit arrays, the following information is provided about each bit:
• Bit number and signal name
• Meaning with signal states 0 and 1
• Function diagram (optional)
The signal is shown on this function diagram.

Dependency
Conditions that must be fulfilled in connection with this parameter. Also includes special effects that can occur between this parameter and others.
See also: List of other relevant parameters to be considered.

Safety notices
Important information that must be observed to avoid the risk of physical injury or material damage.
Information that must be observed to avoid any problems.
Information that the user or operator may find useful.

**Danger**  
The description of this safety notice can be found at the beginning of this manual (see Safety Notices).

**Warning**  
The description of this safety notice can be found at the beginning of this manual (see Safety Notices).

**Caution**  
The description of this safety notice can be found at the beginning of this manual (see Safety Notices).

**Caution**  
The description of this safety notice can be found at the beginning of this manual (see Safety Notices).

**Notice**  
The description of this safety notice can be found at the beginning of this manual (see Safety Notices).

**Note**  
Information that the user or operator may find useful.
1.1.2 Number ranges of parameters

Note:
The following number ranges represent an overview for all of the parameters available for the SINAMICS drive family.
The parameters for the product described in this List Manual are described in detail in Chapter 1.2.

Parameters are grouped into the following number ranges:

Table 1-7 Number ranges for SINAMICS

<table>
<thead>
<tr>
<th>Range</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>From</td>
<td>To</td>
</tr>
<tr>
<td>0000</td>
<td>0099 Display and operation</td>
</tr>
<tr>
<td>0100</td>
<td>0199 Commissioning</td>
</tr>
<tr>
<td>0200</td>
<td>0299 Power unit</td>
</tr>
<tr>
<td>0300</td>
<td>0399 Motor</td>
</tr>
<tr>
<td>0400</td>
<td>0499 Encoder</td>
</tr>
<tr>
<td>0500</td>
<td>0599 Technology and units, motor-specific data, probes</td>
</tr>
<tr>
<td>0600</td>
<td>0699 Thermal monitoring, maximum current, operating hours, motor data, central probe</td>
</tr>
<tr>
<td>0700</td>
<td>0799 Control Unit terminals, measuring sockets</td>
</tr>
<tr>
<td>0800</td>
<td>0839 CDS, DDS data sets, motor changeover</td>
</tr>
<tr>
<td>0840</td>
<td>0879 Sequence control (e.g. signal source for ON/OFF1)</td>
</tr>
<tr>
<td>0880</td>
<td>0899 ESR, parking, control and status words</td>
</tr>
<tr>
<td>0900</td>
<td>0999 PROFIBUS/PROFIdrive</td>
</tr>
<tr>
<td>1000</td>
<td>1199 Setpoint channel (e.g. ramp-function generator)</td>
</tr>
<tr>
<td>1200</td>
<td>1299 Functions (e.g. motor holding brake)</td>
</tr>
<tr>
<td>1300</td>
<td>1399 U/f control</td>
</tr>
<tr>
<td>1400</td>
<td>1799 Control</td>
</tr>
<tr>
<td>1800</td>
<td>1899 Gating unit</td>
</tr>
<tr>
<td>1900</td>
<td>1999 Power unit and motor identification</td>
</tr>
<tr>
<td>2000</td>
<td>2099 Reference values</td>
</tr>
<tr>
<td>2010</td>
<td>2099 Communication (fieldbus)</td>
</tr>
<tr>
<td>2100</td>
<td>2199 Faults and alarms</td>
</tr>
<tr>
<td>2140</td>
<td>2199 Signals and monitoring</td>
</tr>
<tr>
<td>2200</td>
<td>2359 Technology controller</td>
</tr>
<tr>
<td>2360</td>
<td>2399 Staging, hibernation</td>
</tr>
</tbody>
</table>
Table 1-7  Number ranges for SINAMICS, continued

<table>
<thead>
<tr>
<th>Range</th>
<th>From</th>
<th>To</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2500</td>
<td>2699</td>
<td>Position control (LR) and basic positioning (EPOS)</td>
</tr>
<tr>
<td></td>
<td>2700</td>
<td>2719</td>
<td>Reference values, display</td>
</tr>
<tr>
<td></td>
<td>2720</td>
<td>2729</td>
<td>Load gear</td>
</tr>
<tr>
<td></td>
<td>2800</td>
<td>2819</td>
<td>Logic operations</td>
</tr>
<tr>
<td></td>
<td>2900</td>
<td>2930</td>
<td>Fixed values (e.g. percentage, torque)</td>
</tr>
<tr>
<td></td>
<td>3000</td>
<td>3099</td>
<td>Motor identification results</td>
</tr>
<tr>
<td></td>
<td>3100</td>
<td>3109</td>
<td>Real time clock (RTC)</td>
</tr>
<tr>
<td></td>
<td>3110</td>
<td>3199</td>
<td>Faults and alarms</td>
</tr>
<tr>
<td></td>
<td>3200</td>
<td>3299</td>
<td>Signals and monitoring</td>
</tr>
<tr>
<td></td>
<td>3400</td>
<td>3659</td>
<td>Infeed closed-loop control</td>
</tr>
<tr>
<td></td>
<td>3660</td>
<td>3699</td>
<td>Voltage Sensing Module (VSM), Braking Module internal</td>
</tr>
<tr>
<td></td>
<td>3700</td>
<td>3779</td>
<td>Advanced Positioning Control (APC)</td>
</tr>
<tr>
<td></td>
<td>3780</td>
<td>3819</td>
<td>Synchronization</td>
</tr>
<tr>
<td></td>
<td>3820</td>
<td>3849</td>
<td>Friction characteristic</td>
</tr>
<tr>
<td></td>
<td>3850</td>
<td>3899</td>
<td>Functions (e.g. long stator)</td>
</tr>
<tr>
<td></td>
<td>3900</td>
<td>3999</td>
<td>Management</td>
</tr>
<tr>
<td></td>
<td>4000</td>
<td>4599</td>
<td>Terminal Board, Terminal Module (e.g. TB30, TM31)</td>
</tr>
<tr>
<td></td>
<td>4600</td>
<td>4699</td>
<td>Sensor Module</td>
</tr>
<tr>
<td></td>
<td>4700</td>
<td>4799</td>
<td>Trace</td>
</tr>
<tr>
<td></td>
<td>4800</td>
<td>4849</td>
<td>Function generator</td>
</tr>
<tr>
<td></td>
<td>4950</td>
<td>4999</td>
<td>OA application</td>
</tr>
<tr>
<td></td>
<td>5000</td>
<td>5169</td>
<td>Motor spindle</td>
</tr>
<tr>
<td></td>
<td>5400</td>
<td>5499</td>
<td>System droop control (e.g. shaft generator)</td>
</tr>
<tr>
<td></td>
<td>5500</td>
<td>5599</td>
<td>Dynamic grid support (solar)</td>
</tr>
<tr>
<td></td>
<td>5900</td>
<td>6999</td>
<td>SINAMICS GM/SM/GL/SL</td>
</tr>
<tr>
<td></td>
<td>7000</td>
<td>7499</td>
<td>Parallel connection of power units</td>
</tr>
<tr>
<td></td>
<td>7500</td>
<td>7599</td>
<td>SINAMICS SM120</td>
</tr>
<tr>
<td></td>
<td>7700</td>
<td>7729</td>
<td>External signals</td>
</tr>
<tr>
<td></td>
<td>7770</td>
<td>7789</td>
<td>NVRAM, system parameters</td>
</tr>
<tr>
<td></td>
<td>7800</td>
<td>7839</td>
<td>EEPROM read/write parameters</td>
</tr>
<tr>
<td></td>
<td>7840</td>
<td>8399</td>
<td>Internal system parameters</td>
</tr>
<tr>
<td></td>
<td>8400</td>
<td>8449</td>
<td>Real time clock (RTC)</td>
</tr>
<tr>
<td></td>
<td>8500</td>
<td>8599</td>
<td>Data and macro management</td>
</tr>
<tr>
<td></td>
<td>8600</td>
<td>8799</td>
<td>CAN bus</td>
</tr>
</tbody>
</table>
### Table 1-7 Number ranges for SINAMICS, continued

<table>
<thead>
<tr>
<th>Range From</th>
<th>Range To</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>8800</td>
<td>8899</td>
<td>Communication Board Ethernet (CBE), PROFIdrive</td>
</tr>
<tr>
<td>8900</td>
<td>8999</td>
<td>Industrial Ethernet, PROFINET, CBE20</td>
</tr>
<tr>
<td>9000</td>
<td>9299</td>
<td>Topology</td>
</tr>
<tr>
<td>9300</td>
<td>9399</td>
<td>Safety Integrated</td>
</tr>
<tr>
<td>9400</td>
<td>9499</td>
<td>Parameter consistency and storage</td>
</tr>
<tr>
<td>9500</td>
<td>9899</td>
<td>Safety Integrated</td>
</tr>
<tr>
<td>9900</td>
<td>9949</td>
<td>Topology</td>
</tr>
<tr>
<td>9950</td>
<td>9999</td>
<td>Diagnostics (internal)</td>
</tr>
<tr>
<td>10000</td>
<td>10199</td>
<td>Safety Integrated</td>
</tr>
<tr>
<td>11000</td>
<td>11299</td>
<td>Free technology controller 0, 1, 2</td>
</tr>
<tr>
<td>20000</td>
<td>20999</td>
<td>Free function blocks (FBLOCKS)</td>
</tr>
<tr>
<td>21000</td>
<td>25999</td>
<td>Drive Control Chart (DCC)</td>
</tr>
<tr>
<td>50000</td>
<td>53999</td>
<td>SINAMICS DC MASTER (closed-loop DC current control)</td>
</tr>
<tr>
<td>61000</td>
<td>61001</td>
<td>PROFINET</td>
</tr>
</tbody>
</table>
1.2 List of parameters

Product: S110, Version: 4402100, Language: eng

### r0002 Control Unit operating display / CU op_display

<table>
<thead>
<tr>
<th>Description:</th>
<th>Operating display for the Control Unit (CU).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed:</td>
<td>-</td>
</tr>
<tr>
<td>Calculated:</td>
<td>-</td>
</tr>
<tr>
<td>Access level:</td>
<td>1</td>
</tr>
<tr>
<td>Data type:</td>
<td>Integer16</td>
</tr>
<tr>
<td>Dynamic index:</td>
<td>-</td>
</tr>
<tr>
<td>P-Group:</td>
<td>-</td>
</tr>
<tr>
<td>Units group:</td>
<td>-</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
</tr>
<tr>
<td>Scaling:</td>
<td>-</td>
</tr>
<tr>
<td>Expert list:</td>
<td>1</td>
</tr>
<tr>
<td>Min:</td>
<td>0</td>
</tr>
<tr>
<td>Max:</td>
<td>99</td>
</tr>
<tr>
<td>Factory setting:</td>
<td>-</td>
</tr>
</tbody>
</table>

### Notice:
For several missing enable signals, the corresponding value with the highest number is displayed.

### r0002 Drive operating display / Drv op_display

<table>
<thead>
<tr>
<th>Description:</th>
<th>Operating display for the drive.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed:</td>
<td>-</td>
</tr>
<tr>
<td>Calculated:</td>
<td>-</td>
</tr>
<tr>
<td>Access level:</td>
<td>1</td>
</tr>
<tr>
<td>Data type:</td>
<td>Integer16</td>
</tr>
<tr>
<td>Dynamic index:</td>
<td>-</td>
</tr>
<tr>
<td>P-Group:</td>
<td>-</td>
</tr>
<tr>
<td>Units group:</td>
<td>-</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
</tr>
<tr>
<td>Scaling:</td>
<td>-</td>
</tr>
<tr>
<td>Expert list:</td>
<td>1</td>
</tr>
<tr>
<td>Min:</td>
<td>0</td>
</tr>
<tr>
<td>Max:</td>
<td>250</td>
</tr>
<tr>
<td>Factory setting:</td>
<td>-</td>
</tr>
</tbody>
</table>

### Notice:
For several missing enable signals, the corresponding value with the highest number is displayed.
**Parameter**

**List of parameters**

200: Wait for booting/partial booting

250: Device signals a topology error

**Dependency:** Refer to: r0046

**Notice:** For several missing enable signals, the corresponding value with the highest number is displayed.

**Note:**
- OC: Operating condition
- EP: Enable Pulses (pulse enable)
- RFG: Ramp-function generator
- COMM: Commissioning
- MotID: Motor data identification
- SS2: Safe Stop 2
- SOS: Safe Operating Stop
- STO: Safe Torque Off

### p0003 BOP access level / BOP acc_level

| CU_S110-CAN, CU_S110-DP, CU_S110-PN | Can be changed: C1, U, T | Calculated: - | Access level: 1 |
| Data type: Integer16 | Dynamic index: - | Func. diagram: - |
| P-Group: - | Units group: - | Unit selection: - |
| Not for motor type: - | Scaling: - | Expert list: 1 |
| Min 1 | Max 4 | Factory setting 1 |

**Description:** Sets the access level for reading and writing parameters via the Basic Operator Panel (BOP).

**Value:**
1: Standard
2: Extended
3: Expert
4: Service

**Note:**
- Access level 0 (user-defined):
- Parameters from the user-defined list (p0013). Not used as of firmware version 2.6 (p0016).
- Access level 1 (standard):
- Parameters for the simplest operator control possibility (e.g. p1120 = ramp-function generator, ramp-up time).
- Access level 2 (extended):
- Parameters to operate the basic functions of the drive unit.
- Access level 3 (experts):
- Expert know-how is required for these parameters (e.g. BICO parameterization).
- Access level 4 (service):
- For these parameters, it is necessary that authorized service personnel enter the appropriate password (p3950).

### p0005[0...1] BOP operating display selection / BOP op_disp sel

| All objects | Can be changed: U, T | Calculated: - | Access level: 2 |
| Data type: Unsigned16 | Dynamic index: - | Func. diagram: - |
| P-Group: - | Units group: - | Unit selection: - |
| Not for motor type: - | Scaling: - | Expert list: 1 |
| Min 0 | Max 65535 | Factory setting [0] 2, [1] 0 |

**Description:** Sets the parameter number and parameter index for display for p0006 = 2, 4 for the Basic Operator Panel (BOP).

Examples for the SERVO drive object:
- p0005[0] = 21, p0005[1] = 0: Actual speed smoothed (r0021)
- p0005[0] = 25, p0005[1] = 0: Output voltage smoothed (r0025)

**Index:**
- [0] = Parameter number
- [1] = Parameter index

**Dependency:** Refer to: p0006
### List of parameters

#### p0006 BOP operating display mode / BOP op_disp mode

**CU_S110-CAN, CU_S110-DP, CU_S110-PN**

<table>
<thead>
<tr>
<th>Can be changed:</th>
<th>U, T</th>
<th>Calculated:</th>
<th>-</th>
<th>Access level:</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type:</td>
<td>Integer16</td>
<td>Dynamic index:</td>
<td>-</td>
<td>Func. diagram:</td>
<td>-</td>
</tr>
<tr>
<td>P-Group:</td>
<td>-</td>
<td>Units group:</td>
<td>-</td>
<td>Unit selection:</td>
<td>-</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
<td>Scaling:</td>
<td>-</td>
<td>Expert list:</td>
<td>1</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Description:**
Sets the mode of the operating display for the Basic Operator Panel (BOP) in the operating states "ready for operation" and "operation".

**Value:**
4: p0005

**Dependency:**
Refer to: p0005

**Note:**
Mode 0 ... 3 can only be selected if also r0020, r0021 are available on the drive object.
Mode 4 is available for all drive objects.

#### p0006 BOP operating display mode / BOP op_disp mode

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

<table>
<thead>
<tr>
<th>Can be changed:</th>
<th>U, T</th>
<th>Calculated:</th>
<th>-</th>
<th>Access level:</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type:</td>
<td>Integer16</td>
<td>Dynamic index:</td>
<td>-</td>
<td>Func. diagram:</td>
<td>-</td>
</tr>
<tr>
<td>P-Group:</td>
<td>-</td>
<td>Units group:</td>
<td>-</td>
<td>Unit selection:</td>
<td>-</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
<td>Scaling:</td>
<td>-</td>
<td>Expert list:</td>
<td>1</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Description:**
Sets the mode of the operating display for the Basic Operator Panel (BOP) in the operating states "ready for operation" and "operation".

**Value:**
0: Operation --> r0021, otherwise r0020 <-- r0021
1: Operation --> r0021, otherwise r0020
2: Operation --> p0005, otherwise p0005 <-- r0020
3: Operation --> r0002, otherwise r0002 <-- r0020
4: p0005

**Dependency:**
Refer to: p0005

**Note:**
Mode 0 ... 3 can only be selected if also r0020, r0021 are available on the drive object.
Mode 4 is available for all drive objects.

#### p0007 BOP background lighting / BOP lighting

**CU_S110-CAN, CU_S110-DP, CU_S110-PN**

<table>
<thead>
<tr>
<th>Can be changed:</th>
<th>U, T</th>
<th>Calculated:</th>
<th>-</th>
<th>Access level:</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type:</td>
<td>Unsigned32</td>
<td>Dynamic index:</td>
<td>-</td>
<td>Func. diagram:</td>
<td>-</td>
</tr>
<tr>
<td>P-Group:</td>
<td>-</td>
<td>Units group:</td>
<td>-</td>
<td>Unit selection:</td>
<td>-</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
<td>Scaling:</td>
<td>-</td>
<td>Expert list:</td>
<td>1</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Description:**
Sets the delay time until the background lighting of the Basic Operator Panel (BOP) is switched off.
If no keys are actuated, then the background lighting automatically switches itself off after this time has expired.

**Note:**
p0007 = 0: Background lighting is always switched on (factory setting).
p0008  BOP drive object after booting / BOP DO after boot

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p0008 BOP drive object after booting / BOP DO after boot</td>
<td>Sets the required drive object that is active at the Basic Operator Panel (BOP) after booting.</td>
<td>1</td>
<td>65535</td>
</tr>
</tbody>
</table>

The drive object Control Unit is selected using the value 1.

Note:
The value from p0008 initializes the display on the Basic Operator Panel (BOP) at the top left after booting.
The drive object Control Unit is selected using the value 1.

p0009  Device commissioning parameter filter / Dev comm par_filt

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p0009 Device commissioning parameter filter / Dev comm par_filt</td>
<td>Sets the device and basic drive commissioning.</td>
<td>0</td>
<td>149</td>
</tr>
</tbody>
</table>

By appropriately setting this parameter, those parameters are filtered that can be written into in the various commissioning steps.

Value:
0: Ready
1: Device configuration
2: Defining the drive type/function module
3: Drive base configuration
4: Data set base configuration
29: Device download
30: Parameter reset
115: Parameter download
129: Only Siemens internal
149: Only Siemens internal

Notice:
For p0009 = 10000 the following applies:
After the value has been modified, no further parameter modifications can be made and the status is shown in r3996. Modifications can be made again when r3996 = 0.

Note:
The drives can only be powered up outside the device commissioning (the inverter enabled). In this case, p0009 must be 0 (Ready) and the individual drive objects must have already gone into operation (p0010).

p0009 = 1: Device configuration
At the first commissioning of the device, after booting, the device is in the "device configuration" state. To start the internal automatic first commissioning of the drive unit, p0009 should be set to 0 (Ready) after the ID for the actual topology (r0098) was transferred into the ID for the target topology (p0099). To do this, it is sufficient to set a single index value of p0099[x] the same as r0098[x]. Before the device has been completely commissioned, no other parameter can be changed. After the first commissioning was carried out, in this state, when required, other basic device configuration parameters can be adapted (e.g. the basic sampling time in p0110).

p0009 = 2: Defines the drive type / function module
In this state, the drive object types and/or the function modules can be changed or selected for the individual drive objects. To do this, the drive type object can be set using p0107[0...15] and the function can be set using p0108[0...15] (refer to p0101[0...15]).

p0009 = 3: Drive basis configuration
In this state, after the device has been commissioned for the first time, basic changes can be made for the individual drive objects (e.g. sampling times in p0111, p0112, p0115 and the number of data sets in p0120, p0130, p0140, p0170, p0180).

p0009 = 4: Data set basis configuration
In this state, after the device has been commissioned for the first time, for the individual drive objects changes can be made regarding the assignment of the components (p0121, p0131, p0141, p0151, p0161) to the individual data sets and the assignment of the power unit, motor and encoder to the drive data sets (p0185, ...).
### p0009 = 29: Device download

If a download is made using the commissioning software, the device is automatically brought into this state. After the download has been completed, p0009 is automatically set to 0 (ready). It is not possible to manually set p0009 to this value.

### p0009 = 30: Parameter reset

In order to bring the complete unit into the "first commissioning" state or to load the parameters saved using p0977, to start, p0009 must be set to this value. p0976 can then be changed to the required value.

### p0009 = 115: Parameter download

This state allows the complete device and drive commissioning using the parameter services.

### p0010 Drive commissioning parameter filter / Drv comm. par_filt

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Access level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Can be changed: C2(1), T</td>
<td>Calculated: -</td>
<td>Sets the parameter filter to commission a drive. Setting this parameter filters out the parameters that can be written into in the various commissioning steps.</td>
</tr>
<tr>
<td>Data type: Integer16</td>
<td>Dynamic index: -</td>
<td>Func. diagram: 2800, 2846</td>
<td></td>
</tr>
<tr>
<td>P-Group: -</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>10000</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**Value:**
- 0: Ready
- 1: Quick commissioning
- 2: Power unit commissioning
- 3: Motor commissioning
- 4: Encoder commissioning
- 5: Technological application/units
- 15: Data sets
- 17: Basic positioner commissioning
- 25: Position control commissioning
- 29: Only Siemens internal
- 30: Parameter reset
- 95: Safety Integrated commissioning
- 10000: Ready with immediate feedback signal

**Notice:**
For p0010 = 10000 the following applies:
After the value has been modified, no further parameter modifications can be made and the status is shown in r3996. Modifications can be made again when r3996 = 0.

**Note:**
The drive can only be powered up outside the drive commissioning (inverter enable). To realize this, this parameter must be set to 0.
By setting p3900 to a value other than 0, the quick commissioning is completed, and this parameter is automatically reset to 0.
Procedure for "Reset parameter": Set p0010 to 30 and p0970 to 1.
p010 = 10000 corresponds to p0010 = 0. Unlike with p0010 = 0, the parameter modification is applied immediately and the calculations are made in the background. Further parameter modifications cannot be made while the calculations are being performed.

### p0015 Macro drive unit / Macro drv unit

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Access level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CU_S110-CAN, CU_S110-DP, CU_S110-PN</td>
<td>Can be changed: C1</td>
<td>Calculated: -</td>
<td>Runs the corresponding macro files. The selected macro file must be available on the memory card/device memory. Example: p0015 = 6 --&gt; the macro file PM000000.ACX is run.</td>
</tr>
<tr>
<td>Data type: Unsigned32</td>
<td>Dynamic index: -</td>
<td>Func. diagram: -</td>
<td></td>
</tr>
<tr>
<td>P-Group: -</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>999999</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**Caution:**
When executing a specific macro, the corresponding programmed settings are made and become active.
Parameter
List of parameters

Notice:
After the value has been modified, no further parameter modifications can be made and the status is shown in r3996. Modifications can be made again when r3996 = 0.

Note:
The macros in the specified directory are displayed in r8570. r8570 is not in the expert list of the commissioning software.

Macros available as standard are described in the technical documentation of the particular product.
The parameter is not influenced by setting the factory setting.

### p0015
Macro drive object / Macro DO

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>p0015</td>
<td></td>
<td>Runs the corresponding macro files.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The selected macro file must be available on the memory card/device memory.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Example: p0015 = 6 --&gt; the macro file PM000006.ACX is run.</td>
</tr>
</tbody>
</table>

Caution:
When executing a specific macro, the corresponding programmed settings are made and become active.

Notice:
After the value has been modified, no further parameter modifications can be made and the status is shown in r3996. Modifications can be made again when r3996 = 0.

No errors were issued during quick commissioning (p3900 = 1) when writing to parameters of the QUICK_IBN group!

Note:
The macros in the specified directory are displayed in r8570. r8570 is not in the expert list of the commissioning software.

Macros available as standard are described in the technical documentation of the particular product.
The parameter is not influenced by setting the factory setting.

### r0018
Control Unit Firmware-Version / CU FW version

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>r0018</td>
<td></td>
<td>Displays the firmware version of the Control Unit.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Example: The value 1010100 should be interpreted as V01.01.01.00.</td>
</tr>
</tbody>
</table>

### r0019.0...14
CO/BO: Control word BOP / STW BOP

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Displays the control word for the Basic Operator Panel (BOP).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bit field</th>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>0</td>
<td>ON / OFF (OFF1)</td>
<td>ON</td>
<td>OFF (OFF1)</td>
<td>-</td>
</tr>
<tr>
<td>01</td>
<td>1</td>
<td>No coast-down / coast-down (OFF2)</td>
<td>No coast down</td>
<td>Coast down (OFF2)</td>
<td>-</td>
</tr>
<tr>
<td>02</td>
<td>2</td>
<td>No Quick Stop / Quick Stop (OFF3)</td>
<td>No Quick Stop</td>
<td>Quick Stop (OFF3)</td>
<td>-</td>
</tr>
<tr>
<td>07</td>
<td>7</td>
<td>Acknowledge fault (0 -&gt; 1)</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
</tbody>
</table>
List of parameters

Parameter

Description:
Displays the currently smoothed speed setpoint at the input of the speed controller or U/f characteristic (after the interpolator).
Dependency:
Refer to: r0060
Note:
Smoothing time constant = 100 ms
The signal is not suitable as a process quantity and may only be used as a display quantity.
The speed setpoint is available smoothed (r0020) and unsmoothed (r0060).

Parameter

Description:
Displays the smoothed actual value of the motor speed.
Dependency:
Refer to: r0022, r0063
Note:
Smoothing time constant = 100 ms
The signal is not suitable as a process quantity and may only be used as a display quantity.
The speed actual value is available smoothed (r0021, r0022) and unsmoothed (r0063).

Parameter

Description:
Displays the smoothed actual value of the motor speed.
r0022 is identical to r0021, however, it always has units of rpm and contrary to r0021 cannot be changed over.
Dependency:
Refer to: r0021, r0063
Note:
Smoothing time constant = 100 ms
The signal is not suitable as a process quantity and may only be used as a display quantity.
The speed actual value is available smoothed (r0021, r0022) and unsmoothed (r0063).
### r0024
**Output frequency smoothed / f_outp smooth**

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

- **Can be changed:** -
- **Data type:** FloatingPoint32
- **P-Group:** Displays, signals
- **Not for motor type:** -

**Description:**
Displays the smoothed converter frequency.

**Dependency:**
Refer to: r0066

**Note:**
- Smoothing time constant = 100 ms
- The signal is not suitable as a process quantity and may only be used as a display quantity.
- The output frequency is available smoothed (r0024) and unsmoothed (r0066).

**Access level:** 3
**Func. diagram:** 1690, 5300, 5730, 6799
**Units group:** -
**Unit selection:** -
**Expert list:** 1

**Data type:**
FloatingPoint32
**Dynamic index:** -
**Expert list:** 1

**Description:**
Displays the smoothed converter frequency.

**Dependency:**
Refer to: r0066

**Note:**
- Smoothing time constant = 100 ms
- The signal is not suitable as a process quantity and may only be used as a display quantity.
- The output frequency is available smoothed (r0024) and unsmoothed (r0066).

### r0025
**CO: Output voltage smoothed / U_outp smooth**

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

- **Can be changed:** -
- **Data type:** FloatingPoint32
- **P-Group:** Displays, signals
- **Not for motor type:** -

**Min**
- [Vrms]

**Max**
- [Vrms]

**Access level:** 2
**Func. diagram:** 1690, 5730, 6799
**Units group:** -
**Unit selection:** -
**Expert list:** 1

**Description:**
Displays the smoothed output voltage of the power unit.

**Dependency:**
Refer to: r0072

**Note:**
- Smoothing time constant = 100 ms
- The signal is not suitable as a process quantity and may only be used as a display quantity.
- The output voltage is available smoothed (r0025) and unsmoothed (r0072).

### r0026
**CO: DC link voltage smoothed / Vdc smooth**

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

- **Can be changed:** -
- **Data type:** FloatingPoint32
- **P-Group:** Displays, signals
- **Not for motor type:** -

**Min**
- [V]

**Max**
- [V]

**Access level:** 2
**Func. diagram:** 5730, 8750, 8850, 8950
**Units group:** -
**Unit selection:** -
**Expert list:** 1

**Description:**
Displays the smoothed actual value of the DC link voltage.

**Dependency:**
Refer to: r0070

**Notice:**
When measuring a DC link voltage < 200 V, for the Power Module (e.g. PM340) a valid measured value is not supplied. In this case, when an external 24 V power supply is connected, a value of approx. 24 V is displayed in the display parameter.

**Note:**
- Smoothing time constant = 100 ms
- The signal is not suitable as a process quantity and may only be used as a display quantity.
- The DC link voltage is available smoothed (r0026) and unsmoothed (r0070).

**Data type:**
FloatingPoint32
**Dynamic index:** -
**Expert list:** 1

**Description:**
Displays the smoothed actual value of the DC link voltage.

**Dependency:**
Refer to: r0070

**Notice:**
When measuring a DC link voltage < 200 V, for the Power Module (e.g. PM340) a valid measured value is not supplied. In this case, when an external 24 V power supply is connected, a value of approx. 24 V is displayed in the display parameter.

**Note:**
- Smoothing time constant = 100 ms
- The signal is not suitable as a process quantity and may only be used as a display quantity.
- The DC link voltage is available smoothed (r0026) and unsmoothed (r0070).
### Description:
Displays the smoothed absolute actual current value.

### Dependency:
Refer to: r0068

### Notice:
This smoothed signal is not suitable for diagnostics or evaluation of dynamic operations. In this case, the unsmoothed value should be used.

### Note:
Smoothing time constant = 100 ms
The signal is not suitable as a process quantity and may only be used as a display quantity.

### Factory setting
- Min: [Arms]
- Max: [Arms]

---

### Description:
Displays the smoothed actual value of the modulation depth.

### Dependency:
Refer to: r0074

### Note:
Smoothing time constant = 100 ms
The signal is not suitable as a process quantity and may only be used as a display quantity.

### Factory setting
- Min: [%]
- Max: [%]

---

### Description:
Displays the smoothed field-generating actual current.

### Dependency:
Refer to: r0076

### Note:
Smoothing time constant = 100 ms
The signal is not suitable as a process quantity and may only be used as a display quantity.

### Factory setting
- Min: [Arms]
- Max: [Arms]

---

### Description:
Displays the smoothed torque-generating actual current.

### Dependency:
Refer to: r0078

### Factory setting
- Min: [Arms]
- Max: [Arms]
Note: Smoothing time constant = 100 ms
The signal is not suitable as a process quantity and may only be used as a display quantity.
The torque-generating current actual value is available smoothed (r0030 with 100 ms, r0078[1] with p0045) and unsmoothed (r0078[0]).

**r0031**

**Actual torque smoothed / M_act smooth**

SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

<table>
<thead>
<tr>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>2</td>
</tr>
</tbody>
</table>

**Data type:** FloatingPoint32  
**Dynamic index:** -  
**Units group:** 7_1  
**Unit:** p0050

**P-Group:** Displays, signals  
**Not for motor type:** -  
**Scaling:** p2003  
**Expert list:** 1

**Min**  
- [Nm]  

**Max**  
- [Nm]

**Description:** Displays the smoothed torque actual value.

**Dependency:** Refer to: r0080

**Note:** Smoothing time constant = 100 ms  
The signal is not suitable as a process quantity and may only be used as a display quantity.
The active current actual value is available smoothed (r0031) and unsmoothed (r0080).

**r0032**

**CO: Active power actual value smoothed / P_actv_act smth**

SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

<table>
<thead>
<tr>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>2</td>
</tr>
</tbody>
</table>

**Data type:** FloatingPoint32  
**Dynamic index:** -  
**Units group:** 14_10  
**Unit:** p0050

**P-Group:** Displays, signals  
**Not for motor type:** -  
**Scaling:** r2004  
**Expert list:** 1

**Min**  
- [kW]  

**Max**  
- [kW]

**Description:** Displays the smoothed actual value of the active power.

**Dependency:** Refer to: r0082

**Notice:** This smoothed signal is not suitable for diagnostics or evaluation of dynamic operations. In this case, the unsmoothed value should be used.

**Note:** Significance for the drive: Power output at the motor shaft  
The active power is available smoothed (r0032 with 100 ms, r0082[1] with p0045) and unsmoothed (r0082[0]).

**r0033**

**Torque utilization smoothed / M_util smooth**

SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

<table>
<thead>
<tr>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>3</td>
</tr>
</tbody>
</table>

**Data type:** FloatingPoint32  
**Dynamic index:** -  
**Unit:** p2196

**P-Group:** Displays, signals  
**Not for motor type:** -  
**Scaling:** PERCENT  
**Expert list:** 1

**Min**  
- [%]  

**Max**  
- [%]

**Description:** Displays the smoothed torque utilization as a percentage.

The torque utilization is obtained from the required smoothed torque in reference to the torque limit, scaled using p2196.

**Note:** Smoothing time constant = 100 ms  
The signal is not suitable as a process quantity and may only be used as a display quantity.
The torque utilization is available smoothed (r0033) and unsmoothed (r0081).

For $M_{set\ total}$ (r0079) > $M_{max\ offset}$ (p1532), the following applies:
- demanded torque = $M_{set\ total} - M_{max\ offset}$
- actual torque limit = $M_{max\ upper\ effective}$ (r1538) - $M_{max\ offset}$

For $M_{set\ total}$ (r0079) <= $M_{max\ offset}$ (p1532), the following applies:
- demanded torque = $M_{max\ offset} - M_{set\ total}$
- actual torque limit = $M_{max\ offset} - M_{max\ lower\ effective}$ (r1539)

For the actual torque limit = 0, the following applies: r0033 = 100 %  
For the actual torque limit < 0, the following applies: r0033 = 0 %
### r0034 CO: Motor utilization / Motor utilization

- **Can be changed:** -
- **Calculated:** -
- **Access level:** 2
- **Data type:** FloatingPoint32
- **Dynamic index:** -
- **Func. diagram:** 8017
- **P-Group:** Displays, signals
- **Units group:** -
- **Unit selection:** -
- **Not for motor type:** ASM, REL, FEM
- **Scaling:** PERCENT
- **Min:** - [%]
- **Max:** - [%]
- **Expert list:** 1
- **Factory setting:** - [%]

**Description:**
Displays the motor utilization from the thermal I2t motor model.

**Dependency:**
The motor utilization is only determined for permanent-magnet synchronous motors and if the I2t motor model is activated.

The motor utilization is formed from the ratio between the I2t motor model temperature (minus 40 Kelvin) and the reference value p0605 (motor overtemperature, fault threshold) - 40 Kelvin. If p0605 is reduced, r0034 increases and the motor temperature remains the same.

Refer to: p0611, p0612, p0615

**Note:**
- Smoothing time constant = 100 ms
- The signal is not suitable as a process quantity and may only be used as a display quantity.
- A value of r0034 = -200.0 % indicates an invalid display, for example, because the thermal I2t motor model was not activated or was incorrectly parameterized.

### r0035 CO: Motor temperature / Mot temp

- **Can be changed:** -
- **Calculated:** -
- **Access level:** 2
- **Data type:** FloatingPoint32
- **Dynamic index:** -
- **Func. diagram:** 7008, 8016, 8017
- **P-Group:** Displays, signals
- **Units group:** 21_1
- **Unit selection:** p0505
- **Not for motor type:** -
- **Scaling:** p2006
- **Min:** - [°C]
- **Max:** - [°C]
- **Expert list:** 1
- **Factory setting:** - [°C]

**Description:**
Displays the actual temperature in the motor.

**Note:**
- For r0035 not equal to -200.0 °C, the following applies:
  - this temperature display is valid.
  - a KTY sensor is connected.
  - the thermal model for the induction motor is activated (p0612 bit 1 = 1 and temperature sensor de-activated: p0600 = 0 or p0601 = 0).

For r0035 equal to -200.0 °C, the following applies:
- this temperature display is not valid (temperature sensor error).
- A PTC sensor or bimetallic NC contact is connected.
- the temperature sensor of the synchronous motor is de-activated (p0600 = 0 or p0601 = 0).

### r0036 CO: Power unit overload I2t / PU overload I2t

- **Can be changed:** -
- **Calculated:** -
- **Access level:** 3
- **Data type:** FloatingPoint32
- **Dynamic index:** -
- **Func. diagram:** 8014
- **P-Group:** Displays, signals
- **Units group:** -
- **Unit selection:** -
- **Not for motor type:** -
- **Scaling:** PERCENT
- **Min:** - [%]
- **Max:** - [%]
- **Expert list:** 1
- **Factory setting:** - [%]

**Description:**
Displays the power unit overload determined using the I2t calculation.

A current reference value is defined for the I2t monitoring of the power unit. It represents the current that can be conducted by the power unit without any influence of the switching losses (e.g. the continuously permissible current of the capacitors, inductances, busbars, etc.).

If the I2t reference current of the power unit is not exceeded, then an overload (0 %) is not displayed.

In the other case, the degree of thermal overload is calculated, whereby 100% results in a trip.

**Dependency:**
Refer to: p0290, p0294
Refer to: F30005

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SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3
### Parameter List of parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Index</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>r0037[0...1]</strong></td>
<td>Control Unit temperature / CU temperature</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Can be changed: -</td>
<td>Calculated: -</td>
<td>Access level: 3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Data type: FloatingPoint32</td>
<td>Dynamic index: -</td>
<td>Func. diagram: -</td>
<td></td>
</tr>
<tr>
<td></td>
<td>P-Group: Displays, signals</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not for motor type: -</td>
<td>Scaling: p2006</td>
<td>Expert list: 1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- [°C]</td>
<td>- [°C]</td>
<td>- [°C]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Description:</td>
<td>Displays the Control Unit temperature.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>An appropriate message is output when 87 °C is exceeded.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Index:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0] = Temperature actual</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[1] = Temperature maximum</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dependency:</td>
<td>Refer to: A01009</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Note:</td>
<td>The value of -200 indicates that there is no measuring signal.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| **r0037[0...19]** | CO: Power unit temperatures / PU temperatures | | | |
| | Can be changed: - | Calculated: - | Access level: 3 | |
| | Data type: FloatingPoint32 | Dynamic index: - | Func. diagram: 8014 | |
| | P-Group: Displays, signals | Units group: 21_1 | Unit selection: p0505 | |
| | Not for motor type: - | Scaling: p2006 | Expert list: 1 | |
| | Min | Max | Factory setting | |
| | - [°C] | - [°C] | - [°C] | |
| | Description: | Displays the temperatures in the power unit. | | |
| | Index: | | | |
| | [0] = Inverter, maximum value | | | |
| | [1] = Depletion layer maximum value | | | |
| | [2] = Rectifier maximum value | | | |
| | [3] = Air intake | | | |
| | [4] = Interior of power unit | | | |
| | [5] = Inverter 1 | | | |
| | [6] = Inverter 2 | | | |
| | [7] = Inverter 3 | | | |
| | [8] = Inverter 4 | | | |
| | [9] = Inverter 5 | | | |
| | [10] = Inverter 6 | | | |
| | [11] = Rectifier 1 | | | |
| | [12] = Rectifier 2 | | | |
| | [13] = Depletion layer 1 | | | |
| | [14] = Depletion layer 2 | | | |
| | [15] = Depletion layer 3 | | | |
| | [16] = Depletion layer 4 | | | |
| | [17] = Depletion layer 5 | | | |
| | [18] = Depletion layer 6 | | | |
| | [19] = Cooling system liquid intake | | | |
| | Note: | The value of -200 indicates that there is no measuring signal. | | |
| | r0037[0]: Maximum value of the inverter temperatures (r0037[5...10]). | | | |
| | r0037[1]: Maximum value of the depletion layer temperatures (r0037[13...18]). | | | |
| | r0037[2]: Maximum value of the rectifier temperatures (r0037[11...12]). | | | |
| | The maximum value is the temperature of the hottest inverter, depletion layer, or rectifier. | | | |
### p0045 Smoothing time constant, display values / T_smth display

Can be changed: U, T  
Calculated: -  
Access level: 2  
Data type: FloatingPoint32  
Dynamic index: -  
Func. diagram: 4715, 5610, 5730, 6714, 8012

**P-Group:** -  
**Units group:** -  
**Unit selection:** -  
**Access level:** 2

**Description:** Sets the smoothing time constant for the following display values:

SERVO: r0078[1], r0079[1], r0081 (calculated from the quantities smoothed with p0045), r0082[1].

VECTOR: r0063[1], r0068[1], r0080[1], r0082[1].

**Dependency:** Refer to: r0002

**Note:**

The value r0046 = 0 indicates that all enable signals for this drive are present.

Bit 00 = 1 (enable signal missing), if:
- the signal source in p0840 is a 0 signal.
- there is a "switching on inhibited".

Bit 01 = 1 (enable signal missing), if:
- the signal source in p0844 or p0845 is a 0 signal.

### r0046.0...31 CO/BO: Missing enable sig / Missing enable sig

Can be changed: -  
Calculated: -  
Access level: 1  
Data type: Unsigned32  
Dynamic index: -  
Func. diagram: 2634

**P-Group:** Displays, signals  
**Units group:** -  
**Unit selection:** -  
**Access level:** 1

**Description:** Displays missing enable signals that are preventing the closed-loop drive control from being commissioned.

**Bit field:**

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>OFF1 enable missing</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>01</td>
<td>OFF2 enable missing</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>02</td>
<td>OFF3 enable missing</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>03</td>
<td>Operation enable missing</td>
<td>Yes</td>
<td>No</td>
<td>7014, 7016</td>
</tr>
<tr>
<td>04</td>
<td>Armature short-circuit / DC braking, enable missing</td>
<td>Yes</td>
<td>No</td>
<td>7014, 7016</td>
</tr>
<tr>
<td>05</td>
<td>STOP2 enable missing</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>06</td>
<td>STOP1 enable missing</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>08</td>
<td>EP terminals enable missing</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>09</td>
<td>Infeed enable missing</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Ramp-function generator enable missing</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Ramp-function generator start missing</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Setpoint enable missing</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>OFF1 enable internal missing</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>OFF2 enable internal missing</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>OFF3 enable internal missing</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Pulse enable internal missing</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Armature short-circuit/DC braking internal enable missing</td>
<td>Yes</td>
<td>No</td>
<td>7014, 7016</td>
</tr>
<tr>
<td>21</td>
<td>STOP2 enable internal missing</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>STOP1 enable internal missing</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Function bypass active</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Drive inactive or not operational</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>De-magnetizing not completed</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>Brake open missing</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>Cooling system ready signal missing</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>Speed controller inhibited</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>Jog setpoint active</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>
Parameter

List of parameters

Bit 02 = 1 (enable signal missing), if:
- the signal source in p0848 or p0849 is a 0 signal.
Bit 03 = 1 (enable signal missing), if:
- the signal source in p0852 is a 0 signal.
Bit 04 = 1 (armature short-circuit active), if:
- the signal source in p1230 has a 1 signal
Bit 05, Bit 06: Being prepared
Bit 08 = 1 (enable signal missing), if:
- the pulse enable via terminal EP is missing (booksize: X21, chassis: X41).
Bit 09 = 1 (enable signal missing), if:
- the signal source in p0864 is a 0 signal.
Bit 10 = 1 (enable signal missing), if:
- the signal source in p1140 is a 0 signal.
Bit 11 = 1 (enable signal missing) if the speed setpoint is frozen, because:
- the signal source in p1141 is a 0 signal.
- the speed setpoint is entered from jogging and the two signal sources for jogging, bit 0 (p1055) and bit 1 (p1056) have a 1 signal.
Bit 12 = 1 (enable signal missing), if:
- the signal source in p1142 is a 0 signal.
- When activating the function module "basic positioner" (r0108.4 = 1), the signal source in p1142 is set to a 0 signal.
Bit 16 = 1 (enable signal missing), if:
- there is an OFF1 fault response. The system is only enabled if the fault is removed and was acknowledged and the "switching on inhibited" withdrawn with OFF1 = 0.
Bit 17 = 1 (enable signal missing), if:
- commissioning mode is selected (p0009 > 0 or p0010 > 0).
- there is an OFF2 fault response.
- the drive is inactive (p0105 = 0) or is not operational (r7850[DO-Index]=0).
Bit 18 = 1 (enable signal missing), if:
- OFF3 has still not been completed or an OFF3 fault response is present.
Bit 19 = 1 (internal pulse enable missing), if:
- synchronization is running between the basic clock cycle, DRIVE-CLiQ clock cycle and application clock cycle.
Bit 20 = 1 (internal armature short-circuit active), if:
- the drive is not in the state "S4: Operation" or "S5x" (refer to function diagram 2610).
- the internal pulse enable is missing (r0046.19 = 0).
Bit 21 = 1 (enable signal missing), if:
The pulses have been enabled and the speed setpoint has still not been enabled, because:
- the holding brake opening time (p1216) has still not expired.
- the motor has still not been magnetized (induction motor).
- the encoder has not been calibrated (U/f vector and synchronous motor)
Bit 22: Being prepared
Bit 26 = 1 (enable signal missing), if:
- the drive is inactive (p0105 = 0) or is not operational (r7850[DO-Index]=0).
Bit 27 = 1 (enable signal missing), if:
- de-magnetizing has still not been completed (only for vector).
Bit 28 = 1 (enable signal missing), if:
- the holding brake is closed or has still not been opened.
Bit 29 = 1 (enable signal missing), if:
Bit 30 = 1 (speed controller inhibited), if one of the following reasons is present:
- A 0 signal is available via Bi: p0856.
- the function generator with current input is active.
- the measuring function "current controller reference frequency characteristic" is active.
- the pole position identification is active.
- motor data identification is active (only certain steps).
Bit 31 = 1 (enable signal missing), if:
- the speed setpoint from jog 1 or 2 is entered.

---

### r0047 Status, identification / Status ident

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
<th>Can be changed: -</th>
<th>Calculated: -</th>
<th>Access level: 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type: Integer16</td>
<td>Dynamic index: -</td>
<td>Func. diagram: -</td>
<td>Units group: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
</tr>
</tbody>
</table>

#### Description
Displays the currently executed steps or the first step after the enable for the motor identification and pole position identification routines.

#### Value

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>104</td>
<td>-</td>
</tr>
</tbody>
</table>

- No measurement
- PolID: Wait for brake closing time
- PolID: Measurement, step 1
- PolID: Measurement, step 2
- PolID: Measurement, step 3
- PolID: Measurement, step 4
- PolID: Measurement, stage 2
- PolID: Measurement evaluation
- PolID: Measurement end
- MotID: Inductance measurement, step 1
- MotID: Inductance measurement, step 2
- MotID: Inductance measurement evaluation
- MotID: Resistance measurement evaluation
- MotID: Fine synchronization, step 1
- MotID: Fine synchronization, step 2
- MotID: Fine synchronization, step 3
- MotID: Fine synchronization, end
- MotID: Rotating inductance measurement, step 1
- MotID: Rotating inductance measurement, step 2
- MotID: Rotating inductance measurement, step 3
- MotID: Rotating inductance measurement, step 4
- MotID: Rotating inductance measurement evaluation
- MotID: Rotating Inductance measurement end
- MotID: Induction motor measurement, step 1
- MotID: Induction motor measurement, step 2
- MotID: Induction motor measurement, step 3
- MotID: Induction motor measurement, step 4
- MotID: Induction motor measurement, step 5
- Rotating Inductance measurement end
- MotID: Induction motor measurement, step 6
- MotID: Induction motor measurement, step 7
- MotID: Induction motor measurement, step 8
- MotID: Induction motor measurement, step 9
- MotID: Commutating angle, step 1
- MotID: Commutating angle, step 2
- MotID: Commutating angle, step 3
- MotID: Commutating angle, step 4
- MotID: Commutating angle rotating, step 1
- MotID: Commutating angle rotating, step 2
- MotID: Commutating angle rotating, step 3
- MotID: Commutating angle rotating complete
- MotID: kT determination, step 1
- MotID: kT determination, step 2
- MotID: kT determination, step 3
- MotID: kT determination evaluation
- MotID: kT determination end
- MotID: Reluctance constant measurement, step 1
- MotID: Reluctance constant measurement, step 2
- MotID: Reluctance constant measurement, step 3
### List of parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>63: MotID: Reluctance constant measurement end</td>
<td></td>
</tr>
<tr>
<td>70: MotID: Moment of inertia measurement, step 1</td>
<td></td>
</tr>
<tr>
<td>71: MotID: Moment of inertia measurement, step 2</td>
<td></td>
</tr>
<tr>
<td>72: MotID: Moment of inertia measurement, step 3</td>
<td></td>
</tr>
<tr>
<td>73: MotID: Moment of inertia measurement end</td>
<td></td>
</tr>
<tr>
<td>80: MotID: Magnetizing inductance measurement, step 1</td>
<td></td>
</tr>
<tr>
<td>81: MotID: Magnetizing inductance measurement, step 2</td>
<td></td>
</tr>
<tr>
<td>82: MotID: Magnetizing inductance measurement, step 3</td>
<td></td>
</tr>
<tr>
<td>83: MotID: Magnetizing inductance measurement evaluation</td>
<td></td>
</tr>
<tr>
<td>84: MotID: Magnetizing inductance measurement end</td>
<td></td>
</tr>
<tr>
<td>90: MotID: Saturation characteristic, step 1</td>
<td></td>
</tr>
<tr>
<td>91: MotID: Saturation characteristic, step 2</td>
<td></td>
</tr>
<tr>
<td>92: MotID: Saturation characteristic, step 3</td>
<td></td>
</tr>
<tr>
<td>93: MotID: Saturation characteristic evaluation 1</td>
<td></td>
</tr>
<tr>
<td>94: MotID: Saturation characteristic evaluation 2</td>
<td></td>
</tr>
<tr>
<td>95: MotID: Saturation characteristic end</td>
<td></td>
</tr>
<tr>
<td>96: MotID: Converter model, step 1</td>
<td></td>
</tr>
<tr>
<td>97: MotID: Converter model, step 2</td>
<td></td>
</tr>
<tr>
<td>98: MotID: Converter model, step 3</td>
<td></td>
</tr>
<tr>
<td>99: MotID: Converter model, step 4</td>
<td></td>
</tr>
<tr>
<td>100: PolID: Motion-based, step 1</td>
<td></td>
</tr>
<tr>
<td>101: PolID: Motion-based, step 2</td>
<td></td>
</tr>
<tr>
<td>102: PolID: Motion-based, step 3</td>
<td></td>
</tr>
<tr>
<td>103: PolID: Motion-based, step 4</td>
<td></td>
</tr>
<tr>
<td>104: PolID: Motion-based, step 5</td>
<td></td>
</tr>
</tbody>
</table>

#### r0049[0…3] Motor data set/encoder data set effective / MDS/EDS effective

- **SERVO_S110-CAN,** **SERVO_S110-DP,** **SERVO_S110-PN**
- **Can be changed:** -
- **Calculated:** -
- **Access level:** 2
- **Data type:** Unsigned8
- **Dynamic index:** -
- **Func. diagram:** 8565
- **P-Group:** Displays, signals
- **Units group:** -
- **Unit selection:** -
- **Expert list:** 1
- **Min** |
- **Max** |
- **Factory setting** |

- **Description:** Displays the effective Motor Data Set (MDS) and the effective Encoder Data Sets (EDS).
- **Index:**
  - [0] = Motor Data Set MDS effective
  - [1] = Encoder 1 Encoder Data Set EDS effective
  - [2] = Encoder 2 Encoder Data Set EDS effective
  - [3] = Reserved
- **Dependency:** Refer to: p0186, p0187, p0188, r0838
- **Note:** Value 99 means the following: No encoder assigned (not configured).

#### r0050.0…1 CO/BO: Command Data Set CDS effective / CDS effective

- **SERVO_S110-CAN,** **SERVO_S110-DP,** **SERVO_S110-PN**
- **Can be changed:** -
- **Calculated:** -
- **Access level:** 2
- **Data type:** Unsigned8
- **Dynamic index:** -
- **Func. diagram:** 8560
- **P-Group:** Displays, signals
- **Units group:** -
- **Unit selection:** -
- **Expert list:** 1
- **Min** |
- **Max** |
- **Factory setting** |

- **Description:** Displays the effective Command Data Set (CDS).
- **Bit field:**
  - **Bit** |
  - **Signal name** |
  - **1 signal** |
  - **0 signal** |
  - **FP**
  - 00 CDS eff., bit 0 |
  - ON |
  - OFF |
  - -
  - 01 CDS eff., bit 1 |
  - ON |
  - OFF |
  - -

- **Dependency:** Refer to: p0810, r0836
- **Note:** The Command Data Set selected using a binector input (e.g. p0810) is displayed using r0836.
### r0051.0...1 - CO/BO: Drive Data Set DDS effective / DDS effective

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Bit field</th>
<th>Access level</th>
<th>Dynamic index</th>
<th>Func. diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>r0051.0</strong>&lt;sub&gt;...1&lt;/sub&gt;</td>
<td>Displays the effective Drive Data Set (DDS).</td>
<td>00 DDS eff., bit 0</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>01 DDS eff., bit 1</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Dependency:** Refer to: p0820, r0837

**Note:** The drive data set changeover is suppressed when selecting the motor identification, during the rotating measurement, the encoder calibration and the friction characteristic record.

### r0056.1...15 - CO/BO: Status word, closed-loop control / ZSW cl-loop ctrl

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Bit field</th>
<th>Access level</th>
<th>Dynamic index</th>
<th>Func. diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>r0056.1</strong>&lt;sub&gt;...15&lt;/sub&gt;</td>
<td>Displays the status word of the closed-loop control.</td>
<td>01 Demagnetizing completed</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>04 Magnetizing completed</td>
<td>Yes</td>
<td>No</td>
<td>2701</td>
<td></td>
</tr>
<tr>
<td></td>
<td>08 Field weakening active</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>14 Vdc_max controller active</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>15 Vdc_min controller active</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** The bit is immediately set after power-on

**Exception:**

For an induction motor with brake (except for p1215 = 2), the bit is only set when 60% of the reference flux is reached.

### r0060 - CO: Speed setpoint before the setpoint filter / n_set before filt.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Bit field</th>
<th>Access level</th>
<th>Dynamic index</th>
<th>Func. diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>r0060</strong></td>
<td>Displays the actual speed setpoint at the input of the speed controller or U/f characteristic (after the interpolator).</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Dependency:** Refer to: r0020

**Note:** The speed setpoint is available smoothed (r0020) and unsmoothed (r0060).
**Parameter**

**List of parameters**

---

**r0061[0...1]**  
**CO: Actual speed unsmoothed / n_act unsmoothed**

*SERVO_S110-CAN,*  
*SERVO_S110-DP,*  
*SERVO_S110-PN*

- **Can be changed:** -  
- **Calculated:** -  
- **Access level:** 2

**Data type:** FloatingPoint32  
**Dynamic index:** -  
**Func. diagram:** 1580, 4710, 4715

**P-Group:** Displays, signals  
**Units group:** 3_1  
**Unit selection:** p0505

**Not for motor type:** -  
**Scaling:** p2000  
**Expert list:** 1

**Min**  
- [rpm]  
**Max**  
- [rpm]

**Description:** Displays the unsmoothed actual speed values sensed by the encoders.

**Index:**  
[0] = Encoder 1  
[1] = Encoder 2

---

**r0062**  
**CO: Speed setpoint after the filter / n_set after filter**

*SERVO_S110-CAN,*  
*SERVO_S110-DP,*  
*SERVO_S110-PN*

- **Can be changed:** -  
- **Calculated:** -  
- **Access level:** 3

**Data type:** FloatingPoint32  
**Dynamic index:** -  
**Func. diagram:** 1590, 1750, 5020, 5030, 5210, 6030

**P-Group:** Displays, signals  
**Units group:** 3_1  
**Unit selection:** p0505

**Not for motor type:** -  
**Scaling:** p2000  
**Expert list:** 1

**Min**  
- [rpm]  
**Max**  
- [rpm]

**Description:** Displays the actual speed setpoint after the setpoint filters.

**Dependency:** Refer to: r0021, r0022, r0061, p1441

**Note:** The speed actual value is calculated in encoderless operation.  
For operation with encoder, r0063 is smoothed with p1441.  
The speed actual value is available smoothed (r0021, r0022) and unsmoothed (r0063).

---

**r0063**  
**CO: Actual speed smoothed / n_act smooth**

*SERVO_S110-CAN,*  
*SERVO_S110-DP,*  
*SERVO_S110-PN*

- **Can be changed:** -  
- **Calculated:** -  
- **Access level:** 3

**Data type:** FloatingPoint32  
**Dynamic index:** -  
**Func. diagram:** 1580, 1590, 4710, 5300

**P-Group:** Displays, signals  
**Units group:** 3_1  
**Unit selection:** p0505

**Not for motor type:** -  
**Scaling:** p2000  
**Expert list:** 1

**Min**  
- [rpm]  
**Max**  
- [rpm]

**Description:** Displays the current smoothed actual speed for speed control.

**Dependency:** Refer to: r0021, r0022, r0061, p1441

**Note:** The speed actual value is calculated in encoderless operation.  
For operation with encoder, r0063 is smoothed with p1441.  
The speed actual value is available smoothed (r0021, r0022) and unsmoothed (r0063).

---

**r0064**  
**CO: Speed controller system deviation / n_ctrl system dev**

*SERVO_S110-CAN,*  
*SERVO_S110-DP,*  
*SERVO_S110-PN*

- **Can be changed:** -  
- **Calculated:** -  
- **Access level:** 3

**Data type:** FloatingPoint32  
**Dynamic index:** -  
**Func. diagram:** 5040, 6040

**P-Group:** Displays, signals  
**Units group:** 3_1  
**Unit selection:** p0505

**Not for motor type:** -  
**Scaling:** p2000  
**Expert list:** 1

**Min**  
- [rpm]  
**Max**  
- [rpm]

**Description:** Displays the actual system deviation of the speed controller.

**Note:** In servo control mode with active reference model, the system deviation to the P component of the speed controller is displayed.
### List of parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Access level</th>
<th>Data type</th>
<th>Dynamic index</th>
<th>P-Group</th>
<th>Units group</th>
<th>Scaling</th>
<th>Expert list</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>r0065 Slip frequency / f_Slip</td>
<td>Displays the slip frequency for induction motors (ASM).</td>
<td>3</td>
<td>FloatingPoint32</td>
<td>-</td>
<td>Displays, signals</td>
<td>2_1</td>
<td>p2000</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>r0066 CO: Output frequency / f_outp</td>
<td>Displays the Motor Module output frequency.</td>
<td>3</td>
<td>FloatingPoint32</td>
<td>-</td>
<td>Displays, signals</td>
<td>2_1</td>
<td>p2000</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>r0067 CO: Output current, maximum / I_outp max</td>
<td>Displays the maximum output current of the Motor Module.</td>
<td>3</td>
<td>FloatingPoint32</td>
<td>-</td>
<td>Displays, signals</td>
<td>6_2</td>
<td>p2002</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>r0068 CO: Absolute current actual value / I_act abs val</td>
<td>Displays actual absolute current.</td>
<td>3</td>
<td>FloatingPoint32</td>
<td>-</td>
<td>Displays, signals</td>
<td>6_2</td>
<td>p2002</td>
<td>1</td>
<td>-</td>
</tr>
</tbody>
</table>

**Note:**
- For A_INF, S_INF the following applies:
  - The value is updated with the current controller sampling time.
  - The following applies for SERVO:
    - The value is updated with a sampling time of 1 ms.
- Absolute current value = $\sqrt{I_q^2 + I_d^2}$
- The absolute current actual value is available smoothed (r0027) and unsmoothed (r0068).

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SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3
**Parameter**

**List of parameters**

---

**r0069[0...6]**

**Phase current actual value / I_phase act value**

**SERVO_S110-CAN,**
**SERVO_S110-DP,**
**SERVO_S110-PN**

- **Can be changed:** -
- **Calculated:** -
- **Access level:** 3

- **Data type:** FloatingPoint32
- **Dynamic index:** -
- **Func. diagram:** 1630, 5730, 6714, 6730, 6731, 8850, 8950

- **P-Group:** Displays, signals
- **Units group:** 6_5
- **Scaling:** p2002
- **Expert list:** 1

- **Not for motor type:** -
- **Min** - [A]
- **Max** - [A]

**Description:** Displays the measured actual phase currents as peak value.

**Index:**

- [0] = Phase U
- [1] = Phase V
- [2] = Phase W
- [3] = Phase U offset
- [4] = Phase V offset
- [5] = Phase W offset

**Note:**

- In indices 3 ... 5, the offset currents of the 3 phases, which are added to correct the phase currents, are displayed.
- The sum of the 3 corrected phase currents is displayed in index 6.

---

**r0070**

**CO: Actual DC link voltage / Vdc act val**

**SERVO_S110-CAN,**
**SERVO_S110-DP,**
**SERVO_S110-PN**

- **Can be changed:** -
- **Calculated:** -
- **Access level:** 3

- **Data type:** FloatingPoint32
- **Dynamic index:** -
- **Func. diagram:** 5730

- **P-Group:** Displays, signals
- **Units group:** 5_2
- **Scaling:** p2001
- **Expert list:** 1

- **Not for motor type:** -
- **Min** - [V]
- **Max** - [V]

**Description:** Displays the measured actual value of the DC link voltage.

**Dependency:**

- Refer to: r0026

**Notice:**

- For SINAMICS S120 AC Drive (AC/AC) the following applies:
  - When measuring a DC link voltage < 200 V, for the Power Module (e.g. PM340) a valid measured value is not supplied. In this case, when an external 24V power supply is connected, a value of approx. 24 V is displayed.

**Note:**

- The DC link voltage is available smoothed (r0026) and unsmoothed (r0070).

---

**r0072**

**CO: Output voltage / U_output**

**SERVO_S110-CAN,**
**SERVO_S110-DP,**
**SERVO_S110-PN**

- **Can be changed:** -
- **Calculated:** -
- **Access level:** 3

- **Data type:** FloatingPoint32
- **Dynamic index:** -
- **Func. diagram:** 1630, 5730, 6730, 6731, 6799

- **P-Group:** Displays, signals
- **Units group:** 5_1
- **Scaling:** p2001
- **Expert list:** 1

- **Not for motor type:** -
- **Min** - [Vrms]
- **Max** - [Vrms]

**Description:** Displays the actual power unit output voltage (Motor Module).

**Dependency:**

- Refer to: r0025

**Note:**

- The output voltage is available smoothed (r0025) and unsmoothed (r0072).
### CO: Modulat_depth / Modulat_depth

| Parameter Name | Description | Dependency | Note | Values
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>r0074</td>
<td>Displays the actual modulation depth.</td>
<td>Refer to: r0028</td>
<td>This value is irrelevant for the U/f control mode.</td>
<td>For space vector modulation, 100% corresponds to the maximum output voltage without overcontrol. Values above 100 % indicate an overcontrol condition - values below 100% have no overcontrol. The phase voltage (phase-to-phase, rms) is calculated as follows: (r0074 x r0070) / (sqrt(2) x 100 %). The modulation depth is available smoothed (r0028) and unsmoothed (r0074).</td>
</tr>
</tbody>
</table>

### CO: Current setpoint field-generating / ld_set

| Parameter Name | Description | Dependency | Note | Values
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>r0075</td>
<td>Displays the field-generating current setpoint (Id_set).</td>
<td>Refer to: r0029</td>
<td>This value is irrelevant for the U/f control mode.</td>
<td></td>
</tr>
</tbody>
</table>

### CO: Current actual value field-generating / ld_act

| Parameter Name | Description | Dependency | Note | Values
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>r0076</td>
<td>Displays the field-generating current actual value (Id_act).</td>
<td>Refer to: r0029</td>
<td>This value is irrelevant for the U/f control mode.</td>
<td></td>
</tr>
</tbody>
</table>

### CO: Current setpoint torque-generating / iq_set

| Parameter Name | Description | Dependency | Note | Values
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>r0077</td>
<td>Displays the torque/force generating current setpoint.</td>
<td>Refer to: r0029</td>
<td>This value is irrelevant for the U/f control mode.</td>
<td></td>
</tr>
</tbody>
</table>
### r0078[0...1]
**CO: Current actual value torque-generating / Iq_act**

- **Can be changed:** -
- **Calculated:** -
- **Access level:** 3
- **Data type:** FloatingPoint32
- **Dynamic index:** -
- **Func. diagram:** 1630, 5714, 5730
- **P-Group:** Displays, signals
- **Units group:** 6_2
- **Not for motor type:** -
- **Scaling:** p0022
- **Min:** - [Arms]
- **Max:** - [Arms]

**Description:** Displays the torque-generating current actual value (Iq_act).

**Index:**
- [0] = Unsmoothed
- [1] = Smoothed with p0045

**Dependency:** Refer to: r0030, p0045

**Note:**
- These values are irrelevant for the U/f control mode.
- The torque-generating current actual value is available smoothed (r0030 with 100 ms, r0078[1] with p0045) and unsmoothed (r0078[0]).

### r0079[0...1]
**CO: Torque setpoint total / M_set total**

- **Can be changed:** -
- **Calculated:** -
- **Access level:** 3
- **Data type:** FloatingPoint32
- **Dynamic index:** -
- **Func. diagram:** 5610, 8012
- **P-Group:** Displays, signals
- **Units group:** 7_1
- **Not for motor type:** -
- **Scaling:** p0033
- **Min:** - [Nm]
- **Max:** - [Nm]

**Description:** Displays the torque setpoint at the output of the speed controller (before clock cycle interpolation).

**Index:**
- [0] = Unsmoothed
- [1] = Smoothed with p0045

### r0080
**CO: Torque actual value / M_act**

- **Can be changed:** -
- **Calculated:** -
- **Access level:** 3
- **Data type:** FloatingPoint32
- **Dynamic index:** -
- **Func. diagram:** 5730
- **P-Group:** Displays, signals
- **Units group:** 7_1
- **Not for motor type:** -
- **Scaling:** p0033
- **Min:** - [Nm]
- **Max:** - [Nm]

**Description:** Displays the actual torque value.

**Dependency:** Refer to: r0031

**Note:**
- The torque actual value is available smoothed (r0031) and unsmoothed (r0080).

### r0081
**CO: Torque utilization / M_Utilization**

- **Can be changed:** -
- **Calculated:** -
- **Access level:** 3
- **Data type:** FloatingPoint32
- **Dynamic index:** -
- **Func. diagram:** 8012
- **P-Group:** Displays, signals
- **Units group:** -
- **Not for motor type:** -
- **Scaling:** PERCENT
- **Min:** - [%]
- **Max:** - [%]

**Description:** Displays the torque utilization as a percentage.

**Dependency:** Refer to: r0033
Note: The torque utilization is available smoothed (r0033) and unsmoothed (r0081).
The torque utilization is obtained from the required torque referred to the torque limit as follows:
- Positive torque: $r0081 = \frac{(r0079 + p1532)}{(r1538 - p1532)} \times 100\%$
- Negative torque: $r0081 = \frac{(-r0079 + p1532)}{(-r1539 + p1532)} \times 100\%$
The calculation of the torque utilization depends on the selected smoothing time constant (p0045).

### r0082[0...2] CO: Active power actual value / P_act

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Can be changed: -</th>
<th>Calculated: -</th>
<th>Access level: 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type: FloatingPoint32</td>
<td>Dynamic index: -</td>
<td>Func. diagram: 5730</td>
</tr>
<tr>
<td>P-Group: Displays, signals</td>
<td>Units group: 14_5</td>
<td>Unit selection: p0505</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: r2004</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
</tr>
<tr>
<td>- [kW]</td>
<td>- [kW]</td>
<td>- [kW]</td>
</tr>
</tbody>
</table>

**Description:** Displays the instantaneous active power.

**Index:**
- [0] = Unsmoothed
- [1] = Smoothed with p0045
- [2] = Electric power

**Dependency:** Refer to: r0032

**Note:** The mechanical active power is available smoothed (r0032 with 100 ms, r0082[1] with p0045) and unsmoothed (r0082[0]).

### r0083 CO: Flux setpoint / Flex setp

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Can be changed: -</th>
<th>Calculated: -</th>
<th>Access level: 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type: FloatingPoint32</td>
<td>Dynamic index: -</td>
<td>Func. diagram: 5722</td>
</tr>
<tr>
<td>P-Group: Displays, signals</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: PERCENT</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
</tr>
<tr>
<td>- [%]</td>
<td>- [%]</td>
<td>- [%]</td>
</tr>
</tbody>
</table>

**Description:** Displays the flux setpoint.

### r0084 CO: Flux actual value / Flux act val

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Can be changed: -</th>
<th>Calculated: -</th>
<th>Access level: 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type: FloatingPoint32</td>
<td>Dynamic index: -</td>
<td>Func. diagram: 5722</td>
</tr>
<tr>
<td>P-Group: Displays, signals</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: PERCENT</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
</tr>
<tr>
<td>- [%]</td>
<td>- [%]</td>
<td>- [%]</td>
</tr>
</tbody>
</table>

**Description:** Displays the flux actual value.

### r0088 CO: DC link voltage setpoint / Vdc setpoint

<table>
<thead>
<tr>
<th>SERVO_S110-CAN (Tech_ctl), SERVO_S110-DP (Tech_ctl), SERVO_S110-PN (Tech_ctl)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Can be changed: -</th>
<th>Calculated: -</th>
<th>Access level: 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type: FloatingPoint32</td>
<td>Dynamic index: -</td>
<td>Func. diagram: 8940, 8964</td>
</tr>
<tr>
<td>P-Group: Displays, signals</td>
<td>Units group: 5_2</td>
<td>Unit selection: p0505</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: p2001</td>
<td>Expert list: 1</td>
</tr>
</tbody>
</table>

| Min | Max | Factory setting |
| - [V] | - [V] | - [V] |

**Description:** Displays the setpoint for the DC link voltage.
### p0092 Clock synchronous operation pre-assignment/check / Clock sync op

**Can be changed:** C1(1)  
**Calculated:** -  
**Access level:** 1  
**Data type:** Integer16  
**Dynamic index:** -  
**Func. diagram:** -  
**P-Group:** -  
**Units group:** -  
**Expert list:** 1  
**Not for motor type:** -  
**Scaling:** -  
**Factory setting:**  

**Min:** 0  
**Max:** 1  

**Description:**  
Setting to pre-assign/check the sampling times for the internal controller clock cycles for clock-synchronous PROFIdrive operation.  

**p0092 = 1:**  
The controller clock cycles are set so that clock synchronous PROFIdrive operation is possible. If it is not possible to change the controller clock cycles of the clock-cycle synchronous PROFIdrive operation, then an appropriate message is output.  
The pre-setting of the controller clock cycles can result in a derating of the Motor Module (e.g. p0115[0] = 400 µs > 375 µs).  
When the drive unit utilization (r9976) is calculated, its maximum computing time load has already been calculated during ramp-up for clock-cycle synchronous operation and taken into account in r9976 (V4.3 and higher), if fixed DCC run-time groups "Receive AFTER IF1 PROFIdrive PZD" and "Send BEFORE IF1 PROFIdrive PZD" are used.  
**p0092 = 0:**  
The controller clock cycles are set without any restrictions by the clock-cycle PROFIdrive operation (as for up to version V2.3).  
When the drive unit utilization (r9976) is calculated, its maximum computing time load has already been calculated during ramp-up for non-clock-cycle-synchronous operation and taken into account in r9976 (V4.3 and higher), if fixed DCC run-time groups "Receive AFTER IF1 PROFIdrive PZD" and "Send BEFORE IF1 PROFIdrive PZD" are used.  

**Value:**  
0: No isochronous PROFIBUS  
1: Isochronous PROFIBUS  

**Dependency:**  
Refer to: A01224  

**Caution:**  
Only current controller clock cycles (p0115[0]) which are integers of 125 µs are permitted for isochronous mode.  
In addition, current controller clock cycles 31.25 µs and 62.5 µs are possible.  

**Notice:**  
p0092 only affects the automatic default for the clock cycles (p0115) in the drive. If the clock cycles are modified subsequently in expert mode (p0112 = 0), p0092 = 0 should be set so that the new values are not overwritten again by the automatic default when the parameters are downloaded.  
The conditions for current controller clock cycle for isosynchronous operation must still be carefully ensured (refer under Caution!).

---

### r0093 CO: Pole position angle electrically scaled / Pole pos el scale

**Can be changed:** -  
**Calculated:** -  
**Access level:** 3  
**Data type:** FloatingPoint32  
**Dynamic index:** -  
**Func. diagram:** 4710  
**P-Group:** Displays, signals  
**Units group:** -  
**Expert list:** 1  
**Not for motor type:** -  
**Scaling:** p2005  
**Unit selection:** -  

**Min:** - [°]  
**Max:** - [°]  

**Description:**  
Displays the scaled electrical pole position angle.  

**Dependency:**  
Refer to: r0094, p0431, r1778  

**Notice:**  
When the pole position angle (r0093) is output via test socket Tx (x = 0, 1, 2) to adjust the encoder (to determine the angular commutation offset) the test socket being used must be parameterized as follows:  
p0771[x] = r0093  
p0777[x] = 0 %  
p0778[x] = 0 V  
p0779[x] = 400 %  
p0780[x] = 4 V

---

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For p1821 = 1 (counter-clockwise direction of rotation) the following applies:

- the value is generated from r0094 + 180 °.
- this angle can be used to adjust the encoders of synchronous motors.

For pulse enable, the following applies:

- the value indicates the transformation angle used by the control + 180 °.
- this value is, contrary to r0094, also applicable (provides information) for encoderless operation and after a pole position identification routine.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Value</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p0783[x] = 0 V</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>p0784[x] = 0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## r0094
### CO: Transformation angle / Transformat_angle

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>r0094</td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

## p0097
### Select drive object type / Select DO type

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p0097</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

## p0100
### IEC/NEMA mot stds / IEC/NEMA mot stds

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p0100</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
For p0100 = 0, the following applies: The power factor (p0308) should be parameterized.
For p0100 = 1, the following applies: The efficiency (p0309) should be parameterized.

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0: IEC-Motor (50 Hz, SI units)</td>
<td></td>
</tr>
<tr>
<td>1: NEMA motor (60 Hz, US units)</td>
<td></td>
</tr>
</tbody>
</table>

**Dependency:**
If p0100 is changed, all of the rated motor parameters are reset. Only then are possible unit changeovers made.
The units of all motor parameters are changed that are involved in the selection of IEC or NEMA (e.g. r0206, p0307, p0316, r0333, r0334, p0341, p0344, r1493, r1969).
Refer to: r0206, p0210, p0300, p0304, p0305, p0307, p0308, p0310, p0311, p0312, p0314, p0320, p0322, p0323, p0335, r0336, r0337, p0338, p1800

**Note:**
The parameter can only be changed for vector control (p0107).
The parameter value is not reset when the factory setting is restored (p0010 = 30, p0970).

### p0101[0...23] Drive object numbers / DO numbers

<table>
<thead>
<tr>
<th>Index</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Drive object number Control Unit</td>
</tr>
<tr>
<td>1</td>
<td>Drive object number object 1</td>
</tr>
<tr>
<td>2</td>
<td>Drive object number object 2</td>
</tr>
<tr>
<td>3</td>
<td>Drive object number object 3</td>
</tr>
<tr>
<td>4</td>
<td>Drive object number object 4</td>
</tr>
<tr>
<td>5</td>
<td>Drive object number object 5</td>
</tr>
<tr>
<td>6</td>
<td>Drive object number object 6</td>
</tr>
<tr>
<td>7</td>
<td>Drive object number object 7</td>
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<tr>
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<td>Drive object number object 8</td>
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<tr>
<td>9</td>
<td>Drive object number object 9</td>
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<tr>
<td>10</td>
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<td>11</td>
<td>Drive object number object 11</td>
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<tr>
<td>12</td>
<td>Drive object number object 12</td>
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<tr>
<td>13</td>
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</tr>
<tr>
<td>14</td>
<td>Drive object number object 14</td>
</tr>
<tr>
<td>15</td>
<td>Drive object number object 15</td>
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<tr>
<td>16</td>
<td>Drive object number object 16</td>
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<tr>
<td>18</td>
<td>Drive object number object 18</td>
</tr>
<tr>
<td>19</td>
<td>Drive object number object 19</td>
</tr>
<tr>
<td>20</td>
<td>Drive object number object 20</td>
</tr>
<tr>
<td>21</td>
<td>Drive object number object 21</td>
</tr>
<tr>
<td>22</td>
<td>Drive object number object 22</td>
</tr>
<tr>
<td>23</td>
<td>Drive object number object 23</td>
</tr>
</tbody>
</table>

**Note:**
The numbers are automatically assigned once and can no longer be changed as long as the object has not been deleted.
In the commissioning software, this object number cannot be entered using the expert list, but is automatically assigned when inserting an object.
### List of parameters

#### r0102[0...1]

**Number of drive objects / DO count**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Index</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>r0102[0...1]</td>
<td>Displays the number of existing or existing and prepared drive objects.</td>
<td>[0] = Existing drive objects</td>
<td>Refer to: p0101</td>
<td>The numbers of the drive objects are in p0101.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[1] = Existing and prepared drive objects</td>
<td></td>
<td>Displays the number of drive objects that have already been set up.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Displays the number of drive objects that have already been set up and, in addition, the drive objects that still have to be set up.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Can be changed: C1(2)</th>
<th>Calculated: -</th>
<th>Access level: 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type</td>
<td>Unsigned16</td>
<td>Dynamic index: -</td>
<td>Func. diagram: -</td>
</tr>
<tr>
<td>Group</td>
<td>Topology</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type</td>
<td>-</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td></td>
<td>Function setting</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:**
Displays the number of existing or existing and prepared drive objects.

**Index:**
- [0] = Existing drive objects
- [1] = Existing and prepared drive objects

**Dependency:**
Refer to: p0101

**Note:**
The numbers of the drive objects are in p0101.
Displays the number of drive objects that have already been set up.
Displays the number of drive objects that have already been set up and, in addition, the drive objects that still have to be set up.

#### p0108[0...23]

**Drive object, function module / DO function module**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Can be changed: C1(2)</th>
<th>Calculated: -</th>
<th>Access level: 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type</td>
<td>Unsigned32</td>
<td>Dynamic index: -</td>
<td>Func. diagram: -</td>
</tr>
<tr>
<td>Group</td>
<td>-</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type</td>
<td>-</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td></td>
<td>Function setting</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:**
The function module of an existing drive object is entered into each index (see p0101, p0107).
The following bits are available for the Control Unit (Index 0):

- Bit 18: Free function blocks
- Bit 29: CAN
- Bit 30: COMM BOARD
- Bit 31: PROFINET

For all other drive objects (Index > 0), the significance of the bits should be taken from the display parameters r0108 of the drive object.

**Index:**
- [0] = Function module Control Unit
- [1] = Function module object 1
- [2] = Function module object 2
- [3] = Function module object 3
- [4] = Function module object 4
- [5] = Function module object 5
- [6] = Function module object 6
- [7] = Function module object 7
- [8] = Function module object 8
- [9] = Function module object 9
- [10] = Function module object 10
- [12] = Function module object 12
- [13] = Function module object 13
- [14] = Function module object 14
- [15] = Function module object 15
- [16] = Function module object 16
- [17] = Function module object 17
- [18] = Function module object 18
- [19] = Function module object 19
- [20] = Function module object 20
- [21] = Function module object 21

**Data type:**
- unsigned16

**Dynamic index:**
- none

**Units group:**
- none

**Unit selection:**
- none

**Expert list:**
1

**Min Max Factory setting**
- none

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Parameter
List of parameters

[22] = Function module object 22
[23] = Function module object 23

<table>
<thead>
<tr>
<th>Bit field</th>
<th>Bit</th>
<th>Signal name</th>
<th>0 signal</th>
<th>1 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
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<td>Bit 0</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
<td></td>
</tr>
<tr>
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<td>02</td>
<td>Bit 2</td>
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</tr>
<tr>
<td>03</td>
<td>Bit 3</td>
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<td>-</td>
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</tr>
<tr>
<td>04</td>
<td>Bit 4</td>
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<tr>
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<td>Bit 30</td>
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<td>OFF</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>Bit 31</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

Not: A "function module" is a functional expansion of a drive object that can be activated when commissioning.

**Bit field:** Bit name 1 signal 0 signal FP

<table>
<thead>
<tr>
<th>Bit field</th>
<th>Bit</th>
<th>Signal name</th>
<th>0 signal</th>
<th>1 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>02</td>
<td>Bit 0</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>03</td>
<td>Bit 1</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>04</td>
<td>Bit 2</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>05</td>
<td>Bit 3</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>06</td>
<td>Bit 4</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>07</td>
<td>Bit 5</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>08</td>
<td>Bit 6</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>09</td>
<td>Bit 7</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Bit 8</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Bit 9</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Bit 10</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Bit 11</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Bit 12</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Bit 13</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Bit 14</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Bit 15</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Bit 16</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Bit 17</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Bit 18</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Bit 19</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Bit 20</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Bit 21</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Bit 22</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Bit 23</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Bit 24</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>Bit 25</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>Bit 26</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>Bit 27</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>Bit 28</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>Bit 29</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

**Note:**
A "function module" is a functional expansion of a drive object that can be activated when commissioning.

---

**r0108**

Drive object, function module / DO function module

SERVO_S110-CAN

Can be changed: -
Calculated: -
Access level: 2

**Data type:** Unsigned32
**Dynamic index:** -
**Func. diagram:** -
**P-Group:** Closed-loop control
**Units group:** -
**Unit selection:** -
**Not for motor type:** -
**Scaling:** -
**Expert list:** 1

**Min**
**Max**
**Factory setting**

**Description:** Displays the activated function module for the particular drive object.

<table>
<thead>
<tr>
<th>Bit field</th>
<th>Bit</th>
<th>Signal name</th>
<th>0 signal</th>
<th>1 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>02</td>
<td>Bit 0</td>
<td>Closed-loop speed/torque control</td>
<td>Activated</td>
<td>Not activated</td>
<td>-</td>
</tr>
<tr>
<td>03</td>
<td>Bit 1</td>
<td>Closed-loop position control</td>
<td>Activated</td>
<td>Not activated</td>
<td>-</td>
</tr>
<tr>
<td>04</td>
<td>Bit 2</td>
<td>Basic positioner</td>
<td>Activated</td>
<td>Not activated</td>
<td>-</td>
</tr>
<tr>
<td>05</td>
<td>Bit 3</td>
<td>Extended setpoint channel</td>
<td>Activated</td>
<td>Not activated</td>
<td>-</td>
</tr>
<tr>
<td>06</td>
<td>Bit 4</td>
<td>Moment of inertia estimator</td>
<td>Activated</td>
<td>Not activated</td>
<td>-</td>
</tr>
<tr>
<td>07</td>
<td>Bit 5</td>
<td>Safety rotary axis</td>
<td>Activated</td>
<td>Not activated</td>
<td>-</td>
</tr>
<tr>
<td>08</td>
<td>Bit 6</td>
<td>Extended brake control</td>
<td>Activated</td>
<td>Not activated</td>
<td>-</td>
</tr>
<tr>
<td>09</td>
<td>Bit 7</td>
<td>Techn controller</td>
<td>Activated</td>
<td>Not activated</td>
<td>-</td>
</tr>
<tr>
<td>10</td>
<td>Bit 8</td>
<td>Extended messages/monitoring</td>
<td>Activated</td>
<td>Not activated</td>
<td>-</td>
</tr>
<tr>
<td>11</td>
<td>Bit 9</td>
<td>Free function blocks</td>
<td>Activated</td>
<td>Not activated</td>
<td>-</td>
</tr>
<tr>
<td>12</td>
<td>Bit 10</td>
<td>CAN</td>
<td>Activated</td>
<td>Not activated</td>
<td>-</td>
</tr>
</tbody>
</table>

**Note:** A "function module" is a functional expansion of a drive object that can be activated when commissioning.
### List of parameters

**r0108 Drive object, function module / DO function module**

**SERVO_S110-DP**
- **Can be changed:** -
- **Calculated:** -
- **Access level:** 2
- **Data type:** Unsigned32
- **Dynamic index:** -
- **P-Group:** Closed-loop control
- **Units group:** -
- **Unit selection:** -
- **Not for motor type:** -
- **Scaling:** -
- **Expert list:** 1
- **Min**
- **Max**
- **Factory setting**
- **Description:** Displays the activated function module for the particular drive object.
- **Note:** A "function module" is a functional expansion of a drive object that can be activated when commissioning.

**Bit field:**

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>02</td>
<td>Closed-loop speed/torque control</td>
<td>Activated</td>
<td>Not activated</td>
<td>-</td>
</tr>
<tr>
<td>03</td>
<td>Closed-loop position control</td>
<td>Activated</td>
<td>Not activated</td>
<td>-</td>
</tr>
<tr>
<td>04</td>
<td>Basic positioner</td>
<td>Activated</td>
<td>Not activated</td>
<td>-</td>
</tr>
<tr>
<td>08</td>
<td>Extended setpoint channel</td>
<td>Activated</td>
<td>Not activated</td>
<td>-</td>
</tr>
<tr>
<td>10</td>
<td>Moment of inertia estimator</td>
<td>Activated</td>
<td>Not activated</td>
<td>-</td>
</tr>
<tr>
<td>13</td>
<td>Safety rotary axis</td>
<td>Activated</td>
<td>Not activated</td>
<td>-</td>
</tr>
<tr>
<td>14</td>
<td>Extended brake control</td>
<td>Activated</td>
<td>Not activated</td>
<td>-</td>
</tr>
<tr>
<td>16</td>
<td>Techn controller</td>
<td>Activated</td>
<td>Not activated</td>
<td>-</td>
</tr>
<tr>
<td>17</td>
<td>Extended messages/monitoring</td>
<td>Activated</td>
<td>Not activated</td>
<td>-</td>
</tr>
<tr>
<td>18</td>
<td>Free function blocks</td>
<td>Activated</td>
<td>Not activated</td>
<td>-</td>
</tr>
</tbody>
</table>

**r0108 Drive object, function module / DO function module**

**SERVO_S110-PN**
- **Can be changed:** -
- **Calculated:** -
- **Access level:** 2
- **Data type:** Unsigned32
- **Dynamic index:** -
- **P-Group:** Closed-loop control
- **Units group:** -
- **Unit selection:** -
- **Not for motor type:** -
- **Scaling:** -
- **Expert list:** 1
- **Min**
- **Max**
- **Factory setting**
- **Description:** Displays the activated function module for the particular drive object.
- **Note:** A "function module" is a functional expansion of a drive object that can be activated when commissioning.

**Bit field:**

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>02</td>
<td>Closed-loop speed/torque control</td>
<td>Activated</td>
<td>Not activated</td>
<td>-</td>
</tr>
<tr>
<td>03</td>
<td>Closed-loop position control</td>
<td>Activated</td>
<td>Not activated</td>
<td>-</td>
</tr>
<tr>
<td>04</td>
<td>Basic positioner</td>
<td>Activated</td>
<td>Not activated</td>
<td>-</td>
</tr>
<tr>
<td>08</td>
<td>Extended setpoint channel</td>
<td>Activated</td>
<td>Not activated</td>
<td>-</td>
</tr>
<tr>
<td>10</td>
<td>Moment of inertia estimator</td>
<td>Activated</td>
<td>Not activated</td>
<td>-</td>
</tr>
<tr>
<td>13</td>
<td>Safety rotary axis</td>
<td>Activated</td>
<td>Not activated</td>
<td>-</td>
</tr>
<tr>
<td>14</td>
<td>Extended brake control</td>
<td>Activated</td>
<td>Not activated</td>
<td>-</td>
</tr>
<tr>
<td>16</td>
<td>Techn controller</td>
<td>Activated</td>
<td>Not activated</td>
<td>-</td>
</tr>
<tr>
<td>17</td>
<td>Extended messages/monitoring</td>
<td>Activated</td>
<td>Not activated</td>
<td>-</td>
</tr>
<tr>
<td>18</td>
<td>Free function blocks</td>
<td>Activated</td>
<td>Not activated</td>
<td>-</td>
</tr>
<tr>
<td>31</td>
<td>PROFINET</td>
<td>Activated</td>
<td>Not activated</td>
<td>-</td>
</tr>
</tbody>
</table>

**p0121[0...n] Power unit component number / PU comp_no**

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**
- **Can be changed:** C1(4)
- **Calculated:** -
- **Access level:** 3
- **Data type:** Unsigned8
- **Dynamic index:** PDS
- **P-Group:** Data sets
- **Units group:** -
- **Unit selection:** -
- **Not for motor type:** -
- **Scaling:** -
- **Expert list:** 1
- **Min**
- **Max**
- **Factory setting**
- **Description:**
The power unit data set is assigned to a power unit using this parameter.
This unique component number is assigned when parameterizing the topology.
Only component numbers can be entered into this parameter that correspond to a power unit.
- **Note:** For parallel circuit configurations, the parameter index is assigned to a power unit.
### Parameter List of parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>p0124[0...23]</strong> Main component detection using LED / M_comp detect LED</td>
<td>Detection of the main components of the drive object selected via the index.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>r0127[0...n]</strong> Power unit version EPROM data / PU EPROM version</td>
<td>Displays the version of the EPROM data of the power unit.</td>
<td>Refer to: r0147</td>
<td>For parallel circuit configurations, the parameter index is assigned to a power unit.</td>
</tr>
<tr>
<td><strong>r0128[0...n]</strong> Power unit, firmware version / PU FW version</td>
<td>Displays the firmware version of the power unit.</td>
<td>Refer to: r0018, r0148, r0197, r0198</td>
<td></td>
</tr>
<tr>
<td><strong>p0130</strong> Number of Motor Data Sets (MDS) / MDS count</td>
<td>Sets the number of Motor Data Sets (MDS).</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>p0131[0...n]</strong> Motor component number / Mot comp_no</td>
<td>The motor data set is assigned to a motor using this parameter. This unique component number is assigned when parameterizing the topology.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**p0139[0...2]**  
Copy Motor Data Set MDS / Copy MDS  

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Index</th>
<th>Note</th>
<th>p0139[0...2] Copy Motor Data Set MDS / Copy MDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Copying a Motor Data Set (MDS) into another.</td>
<td>0</td>
<td>Procedure: 1. In Index 0, enter which motor data set should be copied. 2. In Index 1, enter the motor data set data that is to be copied into. 3. Start copying: Set index 2 from 0 to 1. p0139[2] is automatically set to 0 when copying is completed. When copying, p0131 is not taken into account.</td>
<td>Can be changed: C2(15)</td>
</tr>
<tr>
<td>Data type: Unsigned8</td>
<td>Dynamic index: -</td>
<td>Unit group: -</td>
<td>Unit selection: -</td>
<td>Func. diagram: 8575</td>
</tr>
<tr>
<td>P-Group: Data sets</td>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>31</td>
<td>0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**p0140**  
Number of Encoder Data Sets (EDS) / EDS count  

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Note</th>
<th>p0140 Number of Encoder Data Sets (EDS) / EDS count</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Sets the number of Encoder Data Sets (EDS). When parameterizing the drive with &quot;no encoder&quot; there must be at least one encoder data set (p0140 &gt;= 1).</td>
<td>When parameterizing the drive with &quot;no encoder&quot; there must be at least one encoder data set (p0140 &gt;= 1).</td>
<td>Can be changed: C1(3)</td>
</tr>
<tr>
<td>Data type: Unsigned8</td>
<td>Dynamic index: -</td>
<td>Unit group: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>P-Group: Data sets</td>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**p0141[0...n]**  
Encoder interface (Sensor Module) component number / Enc_interf comp_no  

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Note</th>
<th>p0141[0...n] Encoder interface (Sensor Module) component number / Enc_interf comp_no</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>This parameter is used to assign the encoder data set to an encoder evaluation (e.g. SMC). This unique component number is assigned when parameterizing the topology. Only component numbers can be entered into this parameter that correspond to an encoder evaluation. If the encoder evaluation and encoder are integrated (motor with DRIVE-CLIQ), then their component numbers are identical. For an SMC, different component numbers are assigned for the SMC (p0141) and the (actual) encoder (p0142).</td>
<td>If the encoder evaluation and encoder are integrated (motor with DRIVE-CLIQ), then their component numbers are identical. For an SMC, different component numbers are assigned for the SMC (p0141) and the (actual) encoder (p0142).</td>
<td>Can be changed: C1(4)</td>
</tr>
<tr>
<td>Data type: Unsigned8</td>
<td>Dynamic index: EDS, p0140</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>P-Group: Data sets</td>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>199</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

**p0142[0...n]**  
Encoder component number / Encoder comp_no  

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Note</th>
<th>p0142[0...n] Encoder component number / Encoder comp_no</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>This parameter is used to assign the encoder data set to an encoder.</td>
<td></td>
<td>Can be changed: C1(4)</td>
</tr>
<tr>
<td>Data type: Unsigned8</td>
<td>Dynamic index: EDS, p0140</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>P-Group: Data sets</td>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>199</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>
This assignment is made using the unique component number that was assigned when parameterizing the topology.

Only component numbers can be entered into this parameter that correspond to an encoder.

Note:
If the encoder evaluation and encoder are integrated (motor with DRIVE-CLiQ), then their component numbers are identical.

For an SMC, different component numbers are assigned for the SMC (p0141) and the (actual) encoder (p0142).

### p0144[0...n] Sensor Module detection via LED / SM detection LED

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Can be changed: U, T</td>
<td>Sensor Module detection via LED / SM detection LED</td>
<td>Detects the Sensor Module assigned to this drive and data set. While p0144 = 1, the READY LED flashes green/orange or red/orange with 2 Hz at the appropriate Sensor Module.</td>
</tr>
<tr>
<td>Data type: Unsigned8</td>
<td>Calculated: -</td>
<td>Dynamic index: EDS, p0140</td>
<td>Func. diagram: -</td>
</tr>
<tr>
<td>P-Group: Encoder</td>
<td>Units group: -</td>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factory setting</td>
<td>Access level: 2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### p0145[0...n] Activate/de-activate encoder interface / Enc_intf act/deact

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Can be changed: C1(4), U, T</td>
<td>Activate/de-activate encoder interface / Enc_intf act/deact</td>
<td>Setting to activate/de-activate an encoder interface (Sensor Module).</td>
</tr>
<tr>
<td>Data type: Integer16</td>
<td>Calculated: -</td>
<td>Dynamic index: EDS, p0140</td>
<td>Func. diagram: -</td>
</tr>
<tr>
<td>P-Group: Data sets</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**Value:**
0: De-activate component
1: Activate component
2: Component, de-activate and not present

**Recommend:** After inserting a component, before activating, first wait for Alarm A01317.

**Dependency:** Refer to: r0146
Refer to: A01314, A01317

**Note:**
The de-activation of an encoder interface corresponds to the "parking encoder" function and has the same effect. The activation of a component can be rejected if the component was inserted for the first time. In this case, it is only possible to activate the component when the pulses for all of the drive objects are inhibited. With the encoder interface for encoder 1 (motor encoder), the relevant drive object for writing the parameter must be in the "Ready for operation" state. With the encoder interface for encoders 2 and 3, the parameter can also be written during operation. Re value = 0, 2:
When a component is deactivated it no longer outputs any errors. If value = 0:
The component was completely commissioned and is deactivated using this value. It can be removed from the DRIVE-CLiQ without any error. If value = 1:
The component must be available for error-free operation. If value = 2:
A component in a project generated offline and set to this value must never be inserted in the actual topology from the very start. For components that comprise several individual components (e.g. Double Motor Modules), it is not permissible to set just one subset to this value.
### List of parameters

#### r0146[0...n] Encoder interface active/inactive / Enc_intf act/inact

**Can be changed:** -  
**Calculated:** -  
**Access level:** 2  
**Data type:** Integer16  
**Dynamic index:** EDS, p0140  
**P-Group:** Data sets  
**Units group:** -  
**Scaling:** -  
**Expert list:** 1  
**Min:** 0  
**Max:** 1  
**Factory setting:** -  
**Dependency:** Refer to: p0145, p0480, p0897  
**Description:** Displays the "active" or "inactive" state of an encoder interface (Sensor Module).  
**Value:**  
0: Component inactive  
1: Component active  

#### r0147[0...n] Sensor Module EEPROM data version / SM EEPROM version

**Can be changed:** -  
**Calculated:** -  
**Access level:** 3  
**Data type:** Unsigned32  
**Dynamic index:** EDS, p0140  
**P-Group:** Encoder  
**Units group:** -  
**Scaling:** -  
**Expert list:** 1  
**Min:** -  
**Max:** -  
**Factory setting:** -  
**Dependency:** Refer to: r0127  
**Description:** Displays the version of the EEPROM data of the Sensor Module.  
**Note:** Example: The value 1010100 should be interpreted as V01.01.01.00.  

#### r0148[0...n] Sensor Module firmware version / SM FW version

**Can be changed:** -  
**Calculated:** -  
**Access level:** 3  
**Data type:** Unsigned32  
**Dynamic index:** EDS, p0140  
**P-Group:** Encoder  
**Units group:** -  
**Scaling:** -  
**Expert list:** 1  
**Min:** -  
**Max:** -  
**Factory setting:** -  
**Dependency:** Refer to: r0018, r0128, r0197, r0198  
**Description:** Displays the firmware version of the Sensor Module.  
**Note:** Example: The value 1010100 should be interpreted as V01.01.01.00.  

#### p0162 Reactor module component number / Reactor comp_no

**Can be changed:** C1(4)  
**Calculated:** -  
**Access level:** 3  
**Data type:** Unsigned8  
**Dynamic index:** -  
**P-Group:** Terminals  
**Units group:** -  
**Scaling:** -  
**Expert list:** 1  
**Min:** 0  
**Max:** 199  
**Factory setting:** 0  
**Description:** Sets the component number for the reactor module.  
This unique component number is assigned when parameterizing the topology.  
Only component numbers can be entered into this parameter that correspond to a filter module.  

---

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SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3
**Parameter List of parameters**

### p0170 Number of Command Data Sets (CDS) / CDS count

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

- **Can be changed:** C1(3)
- **Data type:** Unsigned8
- **P-Group:** Commands
- **Not for motor type:** -
- **Min:** 1
- **Max:** 2
- **Factory setting:** 1

**Description:** Sets the number of Command Data Sets (CDS).

**Note:** It is possible to toggle between command parameters (BICO parameters) using this data set changeover.

### p0180 Number of Drive Data Sets (DDS) / DDS count

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

- **Can be changed:** C1(3)
- **Data type:** Unsigned8
- **P-Group:** Data sets
- **Not for motor type:** -
- **Min:** 1
- **Max:** 2
- **Factory setting:** 1

**Description:** Sets the number of Drive Data Sets (DDS).

### p0184 Encoder interface with pulse encoder / Enc_IF with PE

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

- **Can be changed:** C1(4)
- **Data type:** Unsigned8
- **P-Group:** Data sets
- **Not for motor type:** -
- **Min:** 0
- **Max:** 2
- **Factory setting:** 0

**Description:** Sets the encoder interface used as the pulse encoder.

- 0: No pulse encoder used
- 1: Encoder interface 1 used for pulse encoder
- 2: Encoder interface 2 used for pulse encoder

**Dependency:** Refer to: p0400

### p0186[0...n] Motor Data Sets (MDS) number / MDS number

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

- **Can be changed:** C1(4)
- **Data type:** Unsigned8
- **P-Group:** Data sets
- **Not for motor type:** -
- **Min:** 0
- **Max:** 1
- **Factory setting:** 0

**Description:** Using the parameter, each Drive Data Set (= index) is assigned the associated Motor Data Set (MDS). The parameter value therefore corresponds to the number of the assigned motor data set.

### p0187[0...n] Encoder 1 encoder data set number / Enc 1 EDS number

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

- **Can be changed:** C1(4)
- **Data type:** Unsigned8
- **P-Group:** Data sets
- **Not for motor type:** -
- **Min:** 0
- **Max:** 99
- **Factory setting:** 99

**Description:** Assign a drive data set (= index) the corresponding encoder data set (EDS) for encoder 1. The value corresponds to the number of the assigned encoder data set.
Example:
Encoder data set 0 should be assigned to encoder 1 in drive data set 2.
--> p0187[2] = 0

Note:
A value of 99 means that no encoder has been assigned to this drive data set (not configured).

<table>
<thead>
<tr>
<th>p0188[0...n]</th>
<th>Encoder 2 encoder data set number / Enc 2 EDS number</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAN be changed:</td>
<td>Calculated:</td>
</tr>
<tr>
<td>C1(4)</td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-CAN,</td>
<td>Data type:</td>
</tr>
<tr>
<td>SERVO_S110-DP,</td>
<td>Unsigned8</td>
</tr>
<tr>
<td>SERVO_S110-PN</td>
<td>P-Group:</td>
</tr>
<tr>
<td></td>
<td>Data sets</td>
</tr>
<tr>
<td></td>
<td>Not for motor type:</td>
</tr>
<tr>
<td></td>
<td>-</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td>0</td>
<td>99</td>
</tr>
</tbody>
</table>

Description:
Assign a drive data set (= index) the corresponding encoder data set (EDS) for encoder 2. The value corresponds to the number of the assigned encoder data set.
Example:
Encoder data set 1 should be assigned to encoder 2 in drive data set 2.
--> p0188[2] = 1

Note:
A value of 99 means that no encoder has been assigned to this drive data set (not configured).

<table>
<thead>
<tr>
<th>r0192</th>
<th>Power unit firmware properties / PU FW property</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAN be changed:</td>
<td>Calculated:</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-CAN,</td>
<td>Data type:</td>
</tr>
<tr>
<td>SERVO_S110-DP,</td>
<td>Unsigned32</td>
</tr>
<tr>
<td>SERVO_S110-PN</td>
<td>P-Group:</td>
</tr>
<tr>
<td></td>
<td>Converter</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>Scaling:</td>
</tr>
<tr>
<td></td>
<td>-</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Description:
Displays the properties supported by the power unit firmware.

<table>
<thead>
<tr>
<th>Bit field</th>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Edge modulation possible</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>01</td>
<td>Free telegram can be selected</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>02</td>
<td>Smart mode possible for Active Line Module</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>03</td>
<td>Safety Integrated possible for VECTOR</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>06</td>
<td>Liquid cooling</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>07</td>
<td>SERVO pulse frequency changeover, DDS-dependent</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>08</td>
<td>Simulation mode possible</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>09</td>
<td>Internal armature short-circuit possible</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Autonomous internal armature short-circuit possible</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Infeed temperature inputs X21.1/2</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Integral scaled to half the gating unit clock cycle freq.</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Filtering thermal power unit current limit possible</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>DC link compensation possible in power unit</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>PT100 temperature evaluation possible</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Gating unit with pulse frequency wobbulation possible</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Compound braking possible</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Extended voltage range possible</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Gating unit available with current limitation control</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Component status possible</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Temperature evaluation via Motor Module / CU terminals possible</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Reduced device supply voltage possible</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>
Notice:
This information represents the characteristics/features of the power unit firmware. It does not provide information/data about the characteristics/features of the hardware (e.g., bit 06 = 1 means that although the firmware supports "liquid cooling", a power unit with liquid cooling does not have to be used).

Note:
Re bit 09:
The Motor Module supports the internal armature short-circuit. The function is internally required for voltage protection (p1231 = 3).

Re bit 10:
The Motor Module supports the autonomous internal voltage protection. If the voltage protection function is internally activated (p1231 = 3) the Motor Module decides autonomously - using the DC link voltage - as to whether the short-circuit is activated.

Re bit 23:
The component supports the detection of current actual values (and the detection of valve close durations) with double clocking and phase shift.

---

### r0196[0...255] DRIVE-CLiQ component status / DLQ comp status

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>23</td>
<td>Yes</td>
<td>Current measurement oversampling available</td>
</tr>
<tr>
<td>24</td>
<td>Yes</td>
<td>Keep the relevant data for parking available</td>
</tr>
<tr>
<td>25</td>
<td>Yes</td>
<td>Internal fan operating hours counter available</td>
</tr>
<tr>
<td>26</td>
<td>Yes</td>
<td>Software gating unit in the CU is supported</td>
</tr>
<tr>
<td>27</td>
<td>Yes</td>
<td>Current controller dynamics higher</td>
</tr>
</tbody>
</table>

---

**Notice:**
This information represents the characteristics/features of the power unit firmware. It does not provide information/data about the characteristics/features of the hardware (e.g., bit 06 = 1 means that although the firmware supports "liquid cooling", a power unit with liquid cooling does not have to be used).

**Note:**
Re bit 09:
The Motor Module supports the internal armature short-circuit. The function is internally required for voltage protection (p1231 = 3).

Re bit 10:
The Motor Module supports the autonomous internal voltage protection. If the voltage protection function is internally activated (p1231 = 3) the Motor Module decides autonomously - using the DC link voltage - as to whether the short-circuit is activated.

Re bit 23:
The component supports the detection of current actual values (and the detection of valve close durations) with double clocking and phase shift.

---

**Description:**
Displays the status of DRIVE-CLiQ components.

**Note:**
Structure of status value: Bits 31 ... 08, 07, 06 ... 04, 03 ... 00
Re Bit 31 ... 08: Reserved
Re Bit 07: 1: Part of target topology, 0: Only in actual topology
Re Bit 06 ... 04: 1: Active, 0: Inactive or parked
Re bit 03 ... 00:
0: Component data not available.
1: Power-up, acyclic DRIVE-CLiQ communication (LED = orange).
2: Ready for operation, cyclic DRIVE-CLiQ communication (LED = green).
3: Alarm (LED = green).
4: Fault (LED = red).
5: Detection via LED and ready for operation (LED = green/orange).
6: Detection via LED and alarm (LED = green/orange).
7: Detection via LED and fault (LED = red/orange).
8: Downloading firmware (LED = green/red at 0.5 Hz).
9: Firmware downloading completed, Waiting for POWER ON (LED = green/red at 2.0 Hz).
### List of parameters

#### r0197  Bootloader vers / Bootloader vers
- **CU_S110-CAN, CU_S110-DP, CU_S110-PN**
- **Description:** Displays the bootloader version.
- **Dependency:** Refer to: r0018, r0128, r0148, r0198
- **Note:** Example:
The value 1010100 should be interpreted as V01.01.01.00.

#### r0198[0...1]  BIOS/EEPROM data version / BIOS/EEPROM vers
- **CU_S110-CAN, CU_S110-DP, CU_S110-PN**
- **Description:** Displays the BIOS and EEPROM data version.
r0198[0]: BIOS version
r0198[1]: EEPROM data version
- **Dependency:** Refer to: r0018, r0128, r0148, r0197
- **Note:** Example:
The value 1010100 should be interpreted as V01.01.01.00.

#### p0199[0...24]  Drive object name / DO name
- **SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**
- **Description:** Freely assignable name for a drive object.
- **Note:** The parameter is not influenced by setting the factory setting.

#### r0200[0...n]  Power unit code number actual / PU code no. act
- **SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**
- **Description:** Displays the unique code number of the power unit.
- **Note:**
r0200 = p0201: No power unit found
For parallel circuit configurations, the parameter index is assigned to a power unit.
**Parameter**

**List of parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>p0201[0...n]</strong></td>
<td>Power unit code number / PU code no</td>
<td>Can be changed: C2(2)</td>
</tr>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Data type: Unsigned16</td>
<td>Dynamic index: PDS</td>
</tr>
<tr>
<td>P-Group: Converter</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
</tr>
<tr>
<td>0</td>
<td>65535</td>
<td>0</td>
</tr>
</tbody>
</table>

**Dependency:**
Refer to: F07815

**Note:**
- The parameter is used to identify when the drive is being commissioned for the first time.
- The power unit commissioning can only be exited (p0201 = r0200), if the actual and acknowledged code numbers are identical (p0010 = 2). However, if the comparator in p9906 or p9908 is at 2 (low) or 3 (minimum), the power unit commissioning is automatically set to p0201 = r0200 upon exiting.
- When the code number is changed, the connection voltage (p0210) is checked and, if necessary, adjusted.
- For parallel circuit configurations, the parameter index is assigned to a power unit.

<table>
<thead>
<tr>
<th><strong>r0203[0...15]</strong></th>
<th>Memory card name / Sp_card name</th>
<th>Can be changed: -</th>
<th>Calculated: -</th>
<th>Access level: 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>CU_S110-CAN, CU_S110-DP, CU_S110-PN</td>
<td>Data type: Unsigned8</td>
<td>Dynamic index: -</td>
<td>Func. diagram: -</td>
<td></td>
</tr>
<tr>
<td>P-Group: -</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:**
Displays the name of the memory card in ASCII code.

**Notice:**
- r0203[0]: Name character 1
- ...
- r0203[15]: Name character 16

For the commissioning software, the ASCII characters are displayed uncoded.

**r0203[0...n]** | Actual power unit type / PU actual type | Can be changed: - | Calculated: - | Access level: 3 |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Data type: Integer16</td>
<td>Dynamic index: PDS</td>
<td>Func. diagram: -</td>
</tr>
<tr>
<td>P-Group: Converter</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>400</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

**Description:**
Displays the type of power unit found.

**Value:**
- 2: MICROMASTER 440
- 3: MICROMASTER 411
- 4: MICROMASTER 410
- 5: MICROMASTER 436
- 6: MICROMASTER 440 PX
- 7: MICROMASTER 430
- 100: SINAMICS S
- 101: SINAMICS S (value)
- 102: SINAMICS S (combi)
- 112: PM220 (SINAMICS G120)
- 113: PM230 (SINAMICS G120)
- 114: PM240 (SINAMICS G120)
List of parameters

115: PM250 (SINAMICS G120)
116: PM260 (SINAMICS G120)
118: SINAMICS G120 Px
120: PM340 (SINAMICS S120)
133: SINAMICS G120C
150: SINAMICS G
200: SINAMICS GM
250: SINAMICS SM
260: SINAMICS SM120
300: SINAMICS GL
350: SINAMICS SL
400: SINAMICS DCM

Note:
For parallel circuit configurations, the parameter index is assigned to a power unit.

r0204[0...n] Power unit hardware properties / PU HW property

Can be changed: -   Calculated: -   Access level: 3

Data type: Unsigned32   Dynamic index: PDS   Func. diagram: -
P-Group: Converter   Units group: -   Unit selection: -
Not for motor type: -   Scaling: -   Expert list: 1
Min -   Max -   Factory setting -

Description:
Displays the properties supported by the power unit hardware.

Bit field:

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Device type</td>
<td>DC/AC device</td>
<td>AC/AC device</td>
<td>-</td>
</tr>
<tr>
<td>01</td>
<td>RFI filter available</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>02</td>
<td>Active Line Module available</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>03</td>
<td>Smart Line Module available</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>04</td>
<td>Basic Line Module available with thyristor bridge</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>05</td>
<td>Basic Line Module available with diode bridge</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>06</td>
<td>Liquid cooling with cooling system (chassis PU)</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>07</td>
<td>F3E regenerative feedback into the line supply</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>08</td>
<td>Internal Braking Module</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>09</td>
<td>Different cooling type supported</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>12</td>
<td>Safe Brake Control (SBC) supported</td>
<td>No</td>
<td>Yes</td>
<td>-</td>
</tr>
<tr>
<td>13</td>
<td>Safety Integrated supported</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>14</td>
<td>Internal LC output filter</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
</tbody>
</table>

Note:
For parallel circuit configurations, the parameter index is assigned to a power unit.

r0206[0...4] Rated power unit power / PU P_rated

Can be changed: -   Calculated: -   Access level: 2

Data type: FloatingPoint32   Dynamic index: -   Func. diagram: -
P-Group: Converter   Units group: 14_6   Unit selection: p0100
Not for motor type: -   Scaling: -   Expert list: 1
Min - [kW]   Max - [kW]   Factory setting - [kW]

Description:
Displays the rated power unit power for various load duty cycles.

Index:

[0] = Rating plate
[1] = Load duty cycle with low overload
[2] = Load duty cycle with high overload
[3] = S1 cont duty cyc
[4] = S6 load duty cycle

Dependency:
IEC drives (p0100 = 0): Units kW
NEMA drives (p0100 = 1): Units hp
Refer to: p0100
## Parameter List of parameters

### r0207[0...4]
**Rated power unit current / PU PI\_rated**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Index</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Displays the rated power unit power for various load duty cycles.</td>
<td>[0] = Rating plate</td>
<td>[Arms]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[1] = Load duty cycle with low overload</td>
<td>[Arms]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[2] = Load duty cycle with high overload</td>
<td>[Arms]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[3] = S1 cont duty cyc</td>
<td>[Arms]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[4] = S6 load duty cycle</td>
<td>[Arms]</td>
</tr>
</tbody>
</table>

**Index:**
- [0] = Rating plate
- [1] = Load duty cycle with low overload
- [2] = Load duty cycle with high overload
- [3] = S1 cont duty cycle
- [4] = S6 load duty cycle

**Access level:** 2

**Data type:** FloatingPoint32
**Dynamic index:** -
**P-Group:** Converter
**Units group:** -
**Calculation:** -
**Scaling:** -
**Expert list:** 1

### r0208
**Rated power unit line supply voltage / PU U\_rated**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Index</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>r0208 = 400 : 380 - 480 V +/-10 %</td>
<td>Displays the rated line supply voltage of the power unit.</td>
<td>[0] = Rating plate</td>
<td>[Vrms]</td>
</tr>
<tr>
<td>r0208 = 500 : 500 - 600 V +/-10 %</td>
<td></td>
<td>[1] = Load duty cycle with low overload</td>
<td>[Vrms]</td>
</tr>
<tr>
<td>r0208 = 690 : 660 - 690 V +/-10 %</td>
<td></td>
<td>[2] = Load duty cycle with high overload</td>
<td>[Vrms]</td>
</tr>
</tbody>
</table>

**For the Basic Line Module (BLM) the following applies:**

- r0208 = 690 : 500 - 690 V +/-10 %

**Index:**
- [0] = Rating plate
- [1] = Load duty cycle with low overload
- [2] = Load duty cycle with high overload

**Access level:** 2

**Data type:** FloatingPoint32
**Dynamic index:** -
**P-Group:** Converter
**Units group:** -
**Calculation:** -
**Scaling:** -
**Expert list:** 1

### r0209[0...4]
**Power unit, maximum current / PU I\_max**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Index</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Displays the maximum output current of the power unit.</td>
<td>[0] = Catalog</td>
<td>[Arms]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[1] = Load duty cycle with low overload</td>
<td>[Arms]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[2] = Load duty cycle with high overload</td>
<td>[Arms]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[3] = S1 load duty cycle</td>
<td>[Arms]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[4] = S6 load duty cycle</td>
<td>[Arms]</td>
</tr>
</tbody>
</table>

**Access level:** 2

**Data type:** FloatingPoint32
**Dynamic index:** -
**P-Group:** Converter
**Units group:** -
**Calculation:** -
**Scaling:** -
**Expert list:** 1

### p0210
**Drive unit line supply voltage / V\_connect**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Index</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Sets the drive unit supply voltage.</td>
<td>1 [V] = 63000 [V]</td>
<td>600 [V]</td>
</tr>
</tbody>
</table>

**Access level:** 3

**Data type:** Unsigned16
**Dynamic index:** -
**P-Group:** Converter
**Units group:** -
**Calculation:** -
**Scaling:** -
**Expert list:** 1

**Description:**
- AC/AC unit: The rms value of the phase-to-phase line supply voltage should be entered.
- DC/AC unit: The rated DC voltage of the connection busbar should be entered.
Dependency: Set p1254, p1294 (automatic detection of the Vdc switch-on levels) = 0.
The switch-in thresholds of the Vdc_max controller are then directly determined using p0210.

Caution: If the line supply voltage is higher than the entered value, the Vdc controller may be automatically de-activated in some cases to prevent the motor from accelerating. In this case, an appropriate alarm is output.

Note: Setting ranges for p0210 as a function of the rated power unit voltage:
- U_rated = 400 V:
  - p0210 = 380 ... 480 V (AC/AC), 510 ... 720 V (DC/AC)
  - U_rated = 500 V:
  - p0210 = 500 ... 600 V (AC/AC), 675 ... 900 V (DC/AC)
  - U_rated = 660 V ... 690 V:
  - p0210 = 660 ... 690 V (AC/AC), 890 ... 1035 V (DC/AC)
  - U_rated = 500 V ... 690 V:
  - p0210 = 500 ... 690 V (AC/AC), 675 ... 1035 V (DC/AC)

The pre-charging switch-in threshold for the DC link voltage (Vdc) is calculated from p0210:
Vdc_pre = p0210 * 0.82 * 1.35 (AC/AC)
Vdc_pre = p0210 * 0.82 (DC/AC)

The undervoltage thresholds for the DC link voltage (Vdc) are calculated from p0210 as a function of the rated power unit voltage:
- U_rated = 400 V:
  - U_min = p0210 * 0.78 (AC/AC) > 330 V, p0210 * 0.60 (DC/AC) > 380 V
  - U_rated = 500 V:
  - U_min = p0210 * 0.76 (AC/AC) > 410 V
  - U_rated = 660 V ... 690 V:
  - U_min = p0210 * 0.82 (AC/AC) > 565 V, p0210 * 0.63 (DC/AC) > 650 V
  - U_rated = 500 V ... 690 V:
  - U_min = p0210 * 0.82 (AC/AC) > 420 V, p0210 * 0.63 (DC/AC) > 480 V

### p0212 Power unit configuration / PU config

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
<th>Can be changed: C2(2)</th>
<th>Calculated: -</th>
<th>Access level: 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-Group: Converter</td>
<td>Data type: Unsigned16</td>
<td>Dynamic index: -</td>
<td>Func. diagram: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Expert list: 1</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bit field</th>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>External pre-charging present</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

Dependency: Re bit 01 = 1:
The external pre-charging setting only affects the DC/AC power units.

Caution: Re bit 00:
Working with reduced input voltages de-activates undervoltage detection.

Note:
- Re bit 00 = 0:
  It is not possible to reduce the supply voltage in p0210.
  Re bit 00 = 1:
  With this setting the supply voltage in p0210 can be reduced to 100 V.
  Only operating mode p1300 = 19 is possible.
  Re bit 01 = 0:
  There is no external pre-charging of the DC/AC Motor Modules. The pre-charging monitoring is bypassed.
  Re bit 01 = 1:
  There is external pre-charging of the DC/AC Motor Modules. The pre-charging monitoring is calculated.
### Parameter List of parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p0233 Power unit motor reactor / PU mot reactor</td>
<td>Enters the inductance of a filter connected at the power unit output.</td>
<td>This parameter is automatically pre-set when you select a filter via p0230 if a SIEMENS filter is defined for the power unit.</td>
<td>The parameter cannot be changed if the power unit has an internal sine-wave filter.</td>
</tr>
<tr>
<td>p0234 Power unit sine-wave filter capacitance / PU sine filter C</td>
<td>Enters the capacitance of a sine-wave filter connected at the power unit output.</td>
<td>This parameter is automatically pre-set when you select a filter via p0230 if a SIEMENS filter is defined for the power unit.</td>
<td>The parameter value includes the sum of all of the capacitances of a phase connected in series (phase - ground). The parameter cannot be changed if the power unit has an internal sine-wave filter.</td>
</tr>
<tr>
<td>r0238 Internal power unit resistance / PU R internal</td>
<td>Displays the internal resistance of the power unit (IGBT and line resistance).</td>
<td>For a parallel circuit, the value corresponds to the resistance of a power unit.</td>
<td></td>
</tr>
<tr>
<td>p0249 Power unit cooling type / PU cool type</td>
<td>Sets the cooling type for booksize compact power units. This therefore defines whether for these power units, the internal air cooling is shut down and instead, the &quot;Cold-Plate&quot; cooling type is used.</td>
<td>For booksize compact power units, there is a 4 at the 5th position in the Order No. The parameter is irrelevant for all other power unit types.</td>
<td></td>
</tr>
</tbody>
</table>

**p0233**

- **SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**
- **Can be changed:** C2(2), U, T
- **Data type:** FloatingPoint32
- **P-Group:** Converter
- **Not for motor type:** -
- **Min**
  - 0.000 [mH]
  - 1000.000 [mH]
- **Max**
  - 0.000 [mH]
  - 1000.000 [mH]
- **Expert list:** 1

**Description:**
Enters the inductance of a filter connected at the power unit output.

**Dependency:**
This parameter is automatically pre-set when you select a filter via p0230 if a SIEMENS filter is defined for the power unit.

**Note:**
The parameter cannot be changed if the power unit has an internal sine-wave filter.

**p0234**

- **SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**
- **Can be changed:** C2(2), U, T
- **Data type:** FloatingPoint32
- **P-Group:** Converter
- **Not for motor type:** -
- **Min**
  - 0.000 [µF]
  - 1000.000 [µF]
- **Max**
  - 0.000 [µF]
  - 1000.000 [µF]
- **Expert list:** 1

**Description:**
Enters the capacitance of a sine-wave filter connected at the power unit output.

**Dependency:**
This parameter is automatically pre-set when you select a filter via p0230 if a SIEMENS filter is defined for the power unit.

**Note:**
The parameter value includes the sum of all of the capacitances of a phase connected in series (phase - ground). The parameter cannot be changed if the power unit has an internal sine-wave filter.

**r0238**

- **SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**
- **Can be changed:** -
- **Data type:** FloatingPoint32
- **P-Group:** Converter
- **Not for motor type:** -
- **Min**
  - - [ohm]
  - - [ohm]
- **Max**
  - - [ohm]
  - - [ohm]
- **Expert list:** 1

**Description:**
Displays the internal resistance of the power unit (IGBT and line resistance).

**Note:**
For a parallel circuit, the value corresponds to the resistance of a power unit.

**p0249**

- **SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**
- **Can be changed:** C2(1, 2)
- **Data type:** Integer16
- **P-Group:** Converter
- **Not for motor type:** -
- **Min**
  - 0
  - 1
- **Max**
  - 1
  - 0

**Description:**
Sets the cooling type for booksize compact power units. This therefore defines whether for these power units, the internal air cooling is shut down and instead, the "Cold-Plate" cooling type is used.

**Value:**
0: Air cooling int
1: Cold-Plate

**Note:**
For booksize compact power units, there is a 4 at the 5th position in the Order No. The parameter is irrelevant for all other power unit types.
## List of parameters

### p0251[0...n] Operating hours counter power unit fan / PU fan t_oper

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

- **Can be changed:** T
- **Data type:** Unsigned32
- **P-Group:** Modulation
- **Not for motor type:** -
- **Min:** 0 [h]
- **Max:** 4294967295 [h]

**Description:**
Displays the power unit fan operating hours.
The number of hours operated can only be reset to 0 in this parameter (e.g. after a fan has been replaced).

**Dependency:**
Refer to: p0252

**Note:**
For chassis units, the maximum operating time in the power unit parameter is set to 50000 via the factory setting.

### p0252 Maximum operating time power unit fan / PU fan t_oper max

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

- **Can be changed:** T
- **Data type:** Unsigned32
- **P-Group:** Modulation
- **Not for motor type:** -
- **Min:** 0 [h]
- **Max:** 100000 [h]

**Description:**
Sets the maximum operating time of the power unit fan.
The pre-alarm (warning) is output 500 hours before this set value.
The monitoring is de-activated with p0252 = 0.

**Dependency:**
Refer to: p0251

**Note:**
For chassis units, the maximum operating time in the power unit parameter is set to 50000 via the factory setting.

### p0255[0...1] Power unit contactor monitoring time / PU cont t_monit

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

- **Can be changed:** T
- **Data type:** FloatingPoint32
- **P-Group:** Modulation
- **Not for motor type:** -
- **Min:** 0 [ms]
- **Max:** 6500 [ms]

**Description:**
Sets the monitoring time for internal monitoring of the contactor feedback contacts.

**Index:**
- [0] = Pre-charge contactor
- [1] = Bypass contactor

**Dependency:**
Refer to: F30060, F30061

**Note:**
This parameter is only effective for chassis power units with 3 AC line connection and line contactors.
A value of 0 de-activates the associated line contactor monitoring.

### p0278 DC link voltage undervoltage threshold reduction / Vdc U_under red

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

- **Can be changed:** T
- **Data type:** FloatingPoint32
- **P-Group:** Converter
- **Not for motor type:** -
- **Min:** -80 [V]
- **Max:** 0 [V]

**Description:**
Sets the absolute value by which the threshold to initiate the undervoltage fault (F30003) is reduced.

**Dependency:**
Refer to: p0210, r0296

**Notice:**
When using a Control Supply Module (CSM) for 24 V supply from the DC link, the minimum continuous DC link voltage may not lie below 430 V. DC link voltages in the range 300 ... 430 V are permissible up to a duration of 1 min.
For chassis power units, this parameter has no significance.
### Note:
The resulting shutdown threshold can be read in r0296 and is dependent on the selected rated voltage (p0210) and the power unit being used.

### p0287[0...1] Ground fault monitoring thresholds / Gnd flt threshold

<table>
<thead>
<tr>
<th>Description</th>
<th>Index</th>
<th>Setting</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sets the shutdown thresholds for the ground fault monitoring. The setting is made as a percentage of the maximum power unit current (r0209).</td>
<td>[0] = Threshold at which pre-charging starts</td>
<td>0.0 [%]</td>
<td>100.0 [%]</td>
<td></td>
</tr>
<tr>
<td>[1] = Threshold at which pre-charging stops</td>
<td></td>
<td></td>
<td>[0] 6.0 [%]</td>
<td>[1] 16.0 [%]</td>
</tr>
</tbody>
</table>

**Dependency:**
Refer to: F30021

**Note:**
The parameter only applies to booksize and chassis power units.

De-activating the ground fault monitoring:
- Sequence: --> p0287[1] = 0 --> p0287[0] = 0
- irrespective of the firmware version of the power unit.
Sets the thresholds:
- the prerequisite is at least firmware version 2.2 of the power unit.

### r0289 CO: Maximum power unit output current / PU I_outp max

<table>
<thead>
<tr>
<th>Description</th>
<th>Access level</th>
<th>Data type</th>
<th>Dynamic index</th>
<th>Units group</th>
<th>Unit selection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Displays the actual maximum output current of the power unit taking into account derating factors.</td>
<td>3</td>
<td>FloatingPoint32</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

### p0290 Power unit overload response / PU overld response

<table>
<thead>
<tr>
<th>Description</th>
<th>Access level</th>
<th>Data type</th>
<th>Dynamic index</th>
<th>Units group</th>
<th>Unit selection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sets the response to a thermal overload condition of the power unit. The following quantities can result in a response to thermal overload: - heat sink temperature (r0037.0) - chip temperature (r0037.1) - power unit overload I2T (r0036) Possible measures to avoid thermal overload: - reduce the output current limit r0289 and r0067 (for closed-loop speed/velocity or torque/force control) or the output frequency (for U/f control) indirectly via the output current limit and the intervention of the current limiting controller). - reduce the pulse frequency (only for vector control). A reduction, if parameterized, is always realized after an appropriate alarm is output.</td>
<td>3</td>
<td>Integer16</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Value:**
0: Reduce output current or output frequency
1: No reduction, shutdown when overload threshold is reached
2: Reduce I_output or f_output and f_pulse (not using I2t)
3: Reduce the pulse frequency (not using I2t)
### List of parameters

**Dependency:**
- If a sine-wave filter is parameterized as output filter (p0230 = 3, 4), then only responses can be selected without pulse frequency reduction (p0290 = 0, 1).
- If a fault or alarm is present, then r2135.13 or r2135.15 is set.
- Refer to: r0036, r0037, p0108, r0108, r2135
- Refer to: A05000, A05001, A07805

**Caution:**
- If the thermal overload of the power unit is not sufficiently reduced by the actions taken, the drive is always shut down. This means that the power unit is always protected irrespective of the setting of this parameter.

**Note:**
- The setting p0290 = 0, 2 is only practical if the load decreases with decreasing speed (e.g. for applications with variable torque such as for pumps and fans).
- Under overload conditions, the current and torque limit are reduced, and therefore the motor is braked and forbidden speed ranges (e.g. minimum speed p1080 and suppression [skip] speeds p1091 ... p1094) can be passed through.
- For p0290 = 2, 3, the I2t overload detection of the power unit does not influence the responses.
- When the motor data identification routine is selected, p0290 cannot be changed.

#### p0294 Power unit alarm with I2t overload / PU I2t alm thrsh

- **Can be changed:** U, T
- **Data type:** FloatingPoint32
- **P-Group:** Converter
- **Not for motor type:** -
- **Min:** 10.0 [%]
- **Max:** 100.0 [%]
- **Factory setting:** 95.0 [%]

**Description:**
Sets the alarm threshold for the I2t power unit overload.

**Drive:**
If this threshold is exceeded, an overload alarm is generated and the system responds as parameterized in p0290.

**Infeed:**
When the threshold value is exceeded, only an overload alarm is output.

**Dependency:**
- Refer to: r0036, p0290
- Refer to: A07805

**Note:**
- The I2t fault threshold is 100 %. If this value is exceeded, fault F30005 is output.

#### p0295 Fan run-on time / Fan run-on time

- **Can be changed:** U, T
- **Data type:** FloatingPoint32
- **P-Group:** Converter
- **Not for motor type:** -
- **Min:** 0 [s]
- **Max:** 600 [s]
- **Factory setting:** 0 [s]

**Description:**
Sets the fan run-on time after the pulses for the power unit have been canceled.

**Note:**
- Under certain circumstances, the fan can continue to run for longer than was set (e.g. as a result of the excessively high heat sink temperature).
- For values less than 1 s, a 1 s run on time for the fan is active.

#### r0296 DC link voltage undervoltage threshold / Vdc U_lower_thresh

- **Can be changed:** -
- **Data type:** Unsigned16
- **P-Group:** Converter
- **Not for motor type:** -
- **Min:** - [V]
- **Max:** - [V]

**Description:**
If the DC link voltage falls below this threshold, the Motor Module is shut down due to a DC link undervoltage condition (F30003).

**Dependency:**
- Refer to: p0278
- Refer to: F30003
### r0297 DC link voltage overvoltage threshold / Vdc U_upper_thresh

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

<table>
<thead>
<tr>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>2</td>
</tr>
</tbody>
</table>

**Data type:** Unsigned16  
**Dynamic index:** -  
**Func. diagram:** 8750, 8760, 8850, 8964  
**P-Group:** Converter  
**Units group:** -  
**Unit selection:** -  
**Expert list:** 1  
**Min**  
- [V]  
**Max**  
- [V]  
**Factory setting**  
- [V]

#### Description:
If the DC link voltage exceeds the threshold specified here, the drive unit is tripped due to DC link overvoltage.

#### Dependency:
Refer to: F30002

### p0300[0...n] Motor type selection / Mot type sel

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

<table>
<thead>
<tr>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>C2(1, 3)</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>

**Data type:** Integer16  
**Dynamic index:** MDS, p0130  
**Func. diagram:** 6310  
**P-Group:** Motor  
**Units group:** -  
**Unit selection:** -  
**Expert list:** 1  
**Min**  
0  
**Max**  
10001  
**Factory setting**  
0

#### Description:
Selects the motor type or start to read in the motor parameters for a motor with DRIVE-CLiQ (p0300 = 10000).

For p0300 < 10000 the following applies:
The first digit of the parameter value always defines the general motor type and corresponds to the third-party motor belonging to a motor list:

1 = Rotating induction motor  
2 = Rotating synchronous motor

The type information must be entered to filter motor-specific parameters and to optimize the operating characteristics and behavior. For example, for synchronous motors, power factor (p0308) is neither used nor displayed (in the BOP/AOP).

#### Value:
0: No motor  
1: Induction motor (rotating)  
2: Synchronous motor (rotating, permanent-magnet)  
104: 1PH4 induction motor  
107: 1PH7 induction motor  
108: 1PH8 induction motor  
111: Induction motor (rotary) for OEMs  
200: 1PH8 synchronous motor  
206: 1FT6 synchronous motor  
207: 1FT7 synchronous motor  
222: Synchronous motor (rotary) for OEMs  
236: 1FK6 synchronous motor  
237: 1FK7 synchronous motor  
444: Synchronous motor (linear) for OEMs  
10000: Motor with DRIVE-CLiQ  
10001: Motor with DRIVE-CLiQ 2nd data set

#### Dependency:
When the motor type is changed, the code number in p0301 may be reset to 0.

If p0300 is changed during quick commissioning (p0010 = 1), then the matching technological application (p0500) is automatically pre-assigned. This does not occur when commissioning the motor (p0010 = 3). If p0300 = 10000 is written for a parameter download, p0500 is pre-assigned with DRIVE-CLiQ corresponding to the motor type. Refer to: p0301

#### Caution:
If a catalog motor is selected (p0300 >= 100) and an associated motor code number (p0301), then the parameters, that are associated with this list cannot be changed (write protection). The write protection is canceled if the motor type p0300 is set to a non-Siemens motor that matches p0301 (e.g. p0300 = 2 for p0301 = 2xxxx). Write protection is automatically canceled when the results of motor data identification are copied to the motor parameters.
The motor type of a catalog motor corresponds to the upper three digits of the code number or the following assignment (if the particular motor type is listed):

Type/code number ranges
102 / 102xx, 112xx, 122xx
104 / 104xx, 114xx, 124xx
107 / 107xx, 117xx, 127xx
108 / 108xx, 118xx, 128xx
134 / 134xx, 144xx, 154xx
136 / 136xx, 146xx, 156xx
166 / 166xx, 176xx, 186xx
200 / 200xx, 210xx, 220xx
204 / 204xx, 214xx, 224xx
206 / 206xx, 216xx, 226xx
207 / 207xx, 217xx, 227xx
261 / 261xx, 262xx
283 / 283xx, 293xx
286 / 286xx, 296xx
403 / 403xx, 413xx
406 / 406xx, 416xx, 426xx

Notice: If required, the list of motor codes/encoder codes can be found in the Appendix of the List Manual.

Note: With p0300 = 10000, for a motor with DRIVE-CLiQ, the motor parameters are automatically downloaded, with p0300 = 10001, the motor parameters of a second data set (if available).
If a motor type has not been selected (p0300 = 0), then the drive commissioning routine cannot be exited.
A motor type with a value above p0300 >= 100 describes motors for which a motor parameter list exists.
Motor types with a value below p0300 < 100 correspond to the selection of a third-party motor. When appropriately selected, this means that the motor parameters are pre-assigned the settings for a third-party motor.
This also applies for parameters for a motor with DRIVE-CLiQ. In this case p0300 can only be set to p0300 = 10000 or 10001 (read motor parameters) or to the corresponding non-Siemens motor (first digit of the motor code number) in order to be able to cancel the write protection.

**p0301[0...n]** Motor code number selection / Mot code No. sel

<table>
<thead>
<tr>
<th>Description:</th>
<th>The parameter is used to select a motor from a motor parameter list.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When changing the code number (with the exception to the value 0), all of the motor parameters are pre-assigned from the internally available parameter lists.</td>
<td></td>
</tr>
<tr>
<td>Dependency:</td>
<td>Code numbers can only be selected for motor types that correspond to the motor type selected in p0300. For 1PH2, 1PH4, 1PH7, 1PM4, 1PM6, 1FT6 motors, code numbers are also possible, whose fourth decimal position is greater by a value of 1 or 2 than the matching motor type in p0300. For 1FE1 motors, the third decimal position can be higher by a value of 1.</td>
</tr>
<tr>
<td>Refer to: p0300</td>
<td></td>
</tr>
</tbody>
</table>

| Notice: | If required, the list of motor codes/encoder codes can be found in the Appendix of the List Manual. |
| Note: | The motor code number can only be changed if the matching catalog motor was first selected in p0300. |
| For a motor with DRIVE-CLiQ, p0301 cannot be changed. In this case, p0301 is automatically written to the code number of the motor parameter read in (r0302) if p0300 is set to 10000. |
| When selecting a catalog motor (p0300 >= 100), drive commissioning can only be exited if a code number is selected. |
| If, for direct drives, the motor code number (p0301) is changed, this does not automatically result in the angular commutation offset being determined (p0431). |
**Parameter**

**List of parameters**

---

**r0302[0...n]** Motor code number of motor with DRIVE-CLiQ / Motor code Mot DLQ

**SERVO_S110-CAN,**
**SERVO_S110-DP,**
**SERVO_S110-PN**

- Can be changed: -
- Calculated: -
- Access level: 2

**Data type:** Unsigned16
**Dynamic index:** MDS, p0130
**Func. diagram:** -

**P-Group:** Motor
**Units group:** -
**Unit selection:** -
**Not for motor type:** -
**Scaling:** -
**Expert list:** 1

**Min**
**Max**
**Factory setting**

- - -

**Description:** Displays the motor code number from the saved motor data from a motor with DRIVE-CLiQ.

**Note:**
Drive commissioning can only be exited if the code number that was downloaded (r0302) matches the stored code number (p0301). If the numbers differ, then the motor data set should be re-loaded using p0300 = 10000.

The motor data are always expected from the first encoder that is assigned to the drive data sets (refer to p0187 = encoder 1) data set number.

The value is not updated cyclically but only on specific events (e.g. update DRIVE-CLiQ device).

**r0302 = 0:** No motor with DRIVE-CLiQ found

---

**r0303[0...n]** Motor with DRIVE-CLiQ status word / Motor w DLQ ZSW

**SERVO_S110-CAN,**
**SERVO_S110-DP,**
**SERVO_S110-PN**

- Can be changed: -
- Calculated: -
- Access level: 2

**Data type:** Unsigned16
**Dynamic index:** MDS, p0130
**Func. diagram:** -

**P-Group:** Motor
**Units group:** -
**Unit selection:** -
**Not for motor type:** -
**Scaling:** -
**Expert list:** 1

**Min**
**Max**
**Factory setting**

- - -

**Description:** Displays the status word of the automatic motor parameter sensing of a motor with DRIVE-CLiQ.

Motor parameter sensing takes place in the following events if the SMI is connected to the Motor Module and the encoder is activated (p0145):
- Warm restart
- downloading projects.
- POWER ON (off/on).
- where p0300 = 10000, 10001.

**Bit field:**

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Motor data set selected</td>
<td>MDS1</td>
<td>MDS0</td>
<td>-</td>
</tr>
<tr>
<td>01</td>
<td>Motor connection type</td>
<td>Delta</td>
<td>Star</td>
<td>-</td>
</tr>
<tr>
<td>02</td>
<td>Windings can be changed</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>03</td>
<td>Windings can be changed number</td>
<td>2</td>
<td>0</td>
<td>-</td>
</tr>
</tbody>
</table>

**Dependency:**
Refer to: p0145, p0300

**Note:**
SMI: SINAMICS Sensor Module Integrated

---

**p0304[0...n]** Rated motor voltage / Mot U_rated

**SERVO_S110-CAN,**
**SERVO_S110-DP,**
**SERVO_S110-PN**

- Can be changed: C2(1, 3)
- Calculated: -
- Access level: 1

**Data type:** FloatingPoint32
**Dynamic index:** MDS, p0130
**Func. diagram:** 6300, 6724

**P-Group:** Motor
**Units group:** -
**Unit selection:** -
**Not for motor type:** -
**Scaling:** -
**Expert list:** 1

**Min**
**Max**
**Factory setting**

0 [Vrms] 20000 [Vrms] 0 [Vrms]

**Description:**
Sets the rated motor voltage (rating plate).

**Dependency:**
Refer to: p0349

**Caution:**
When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.

**Note:**
When the parameter value is entered the connection type of the motor (star-delta) must be taken into account.
### List of parameters

#### p0305[0...n] Rated motor current / Mot I\textsubscript{rated}

<table>
<thead>
<tr>
<th>Parameter Name</th>
<th>Description</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>p0305</td>
<td>Sets the rated motor current (rating plate).</td>
<td>C2(1, 3)</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>

**Dependency:**
- SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

- **Data type:** FloatingPoint32
- **P-Group:** Motor
- **Not for motor type:** -
- **Min:** 0.00 [Ams]
- **Max:** 10000.00 [Ams]

- **Dependency:** Refer to: p0349
- **Caution:** When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.
- **Notice:** If p0305 is changed during quick commissioning (p0010 = 1), then the maximum current p0640 is pre-assigned accordingly. This is not the case when commissioning the motor (p0010 = 3).
- **Note:** When the parameter value is entered the connection type of the motor (star-delta) must be taken into account.

#### p0307[0...n] Rated motor power / Mot P\textsubscript{rated}

<table>
<thead>
<tr>
<th>Parameter Name</th>
<th>Description</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>p0307</td>
<td>Sets the rated motor power (rating plate).</td>
<td>C2(1, 3)</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>

**Dependency:**
- SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

- **Data type:** FloatingPoint32
- **P-Group:** Motor
- **Not for motor type:** -
- **Min:** 0.00 [kW]
- **Max:** 100000.00 [kW]

- **Dependency:** Refer to: p0100
- **Caution:** When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.

#### p0308[0...n] Rated motor power factor / Mot cos\phi\textsubscript{rated}

<table>
<thead>
<tr>
<th>Parameter Name</th>
<th>Description</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>p0308</td>
<td>Sets the rated motor power factor (cos phi, rating plate).</td>
<td>C2(1, 3)</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>

**Dependency:**
- SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

- **Data type:** FloatingPoint32
- **P-Group:** Motor
- **Not for motor type:** PEM, REL
- **Min:** 0.000
- **Max:** 1.000

- **Dependency:** This parameter is only available for IEC motors (p0100 = 0).

- **Caution:** When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.
- **Note:** The parameter is not used for synchronous motors (p0300 = 2xx).

#### p0310[0...n] Rated motor frequency / Mot f\textsubscript{rated}

<table>
<thead>
<tr>
<th>Parameter Name</th>
<th>Description</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>p0310</td>
<td>Sets the rated motor frequency (rating plate).</td>
<td>C2(1, 3)</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>

**Dependency:**
- SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

- **Data type:** FloatingPoint32
- **P-Group:** Motor
- **Not for motor type:** -
- **Min:** 0.00 [Hz]
- **Max:** 3000.00 [Hz]

- **Dependency:** Refer to: p0100, r0332
- **Caution:** When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.

- **Note:** The parameter value is internally calculated and displayed in r0332.
Parameter
List of parameters

Dependency: The number of pole pairs (r0313) is automatically re-calculated when the parameter is changed (together with p0311), if p0314 = 0.
If p0310 is changed during quick commissioning (p0010 = 1), then the maximum speed p1082, which is also associated with quick commissioning, is pre-assigned accordingly.
Refer to: p0311, r0313, p0314

Caution: When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.

Notice: If p0310 is changed during quick commissioning (p0010 = 1), the maximum speed p1082, which is also associated with quick commissioning, is pre-assigned accordingly. This is not the case when commissioning the motor (p0010 = 3).

Note: For synchronous motors, the parameter is not required and must therefore be pre-assigned zero. For p0310 = 0, it is not possible to calculate the pole pair; instead, it must be entered in p0314.

p0311[0...n] Rated motor speed / Mot n_rated
Can be changed: C2(1, 3)
Data type: FloatingPoint32
P-Group: Motor
Not for motor type: -
Min 0.0 [rpm]
Max 210000.0 [rpm]
Access level: 1
Fact. setting 0.0 [rpm]

Description: Sets the rated motor speed (rating plate).

Caution: When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.

Notice: If p0311 is changed during quick commissioning (p0010 = 1), the maximum speed p1082, which is also associated with quick commissioning, is pre-assigned accordingly. This is not the case when commissioning the motor (p0010 = 3).

p0312[0...n] Rated motor torque / Mot M_rated
Can be changed: C2(3)
Data type: FloatingPoint32
P-Group: Motor
Not for motor type: ASM, REL, FEM
Min 0.00 [Nm]
Max 1000000.00 [Nm]
Access level: 3
Fact. setting 0.00 [Nm]

Description: Sets the rated motor torque (rating plate).

Caution: When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.

r0313[0...n] Motor pole pair number, actual (or calculated) / Mot PolePairNo act
Can be changed: -
Data type: Unsigned16
P-Group: Motor
Not for motor type: -
Min -
Max -
Access level: 2
Fact. setting -

Description: Displays the number of motor pole pairs. The value is used for internal calculations.
r0313 = 1: 2-pole motor
r0313 = 2: 4-pole motor, etc.

Dependency: For p0314 > 0, the entered value is displayed in r0313.
For p0314 = 0, the pole pair number (r0313) is automatically calculated from the rated frequency (p0310) and the rated speed (p0311).
Refer to: p0310, p0311, p0314
**Note:**
For the automatic calculation, the pole pair number is set to the value of 2 if the rated speed or the rated frequency is zero.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Access level</th>
<th>Data type</th>
<th>Dynamic index</th>
<th>Units group</th>
<th>Access level</th>
<th>Expert list</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>p0314[0...n]</strong></td>
<td>Motor pole pair number / Mot pole pair No.</td>
<td>1</td>
<td>Unsigned16</td>
<td>MDS, p0130</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td><strong>p0316[0...n]</strong></td>
<td>Motor torque constant / Mot kT</td>
<td>1</td>
<td>FloatingPoint32</td>
<td>MDS, p0130</td>
<td>28_1</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td><strong>p0318[0...n]</strong></td>
<td>Motor stall current / Mot I_standstill</td>
<td>3</td>
<td>FloatingPoint32</td>
<td>MDS, p0130</td>
<td>-</td>
<td>8017</td>
<td>1</td>
</tr>
</tbody>
</table>

### p0314[0...n]
**Can be changed:** C2(1, 3)
**Data type:** Unsigned16
**P-Group:** Motor
**Not for motor type:** -

**Description:**
Sets the motor pole pair number.
- p0314 = 1: 2-pole motor
- r0314 = 2: 4-pole motor, etc.

**Dependency:**
For p0314 = 0, the pole pair number is automatically calculated from the rated frequency (p0310) and the rated speed (p0311) and displayed in r0313.

**Notice:**
- If p0314 is changed during quick commissioning (p0010 = 1), the maximum speed p1082, which is also associated with quick commissioning, is pre-assigned accordingly. This is not the case when commissioning the motor (p0010 = 3).
- For induction motors, the value need only be input if the rated data of a generator is entered therefore resulting in a negative rated slip. In this case, the number of pole pairs in r0313 is too low by 1 and must be manually corrected.

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>4000</td>
</tr>
</tbody>
</table>

### p0316[0...n]
**Can be changed:** C2(1, 3), U, T
**Data type:** FloatingPoint32
**P-Group:** Motor
**Not for motor type:** ASM, REL, FEM

**Description:**
Sets the torque constant of the synchronous motor.
- p0316 = 0: The torque constant is calculated from the motor data.
- p0316 > 0: The selected value is used as torque constant.

**Dependency:**
Refer to: r0334, r1937

**Caution:**
When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.00 [Nm/A]</td>
<td>400.00 [Nm/A]</td>
</tr>
</tbody>
</table>

### p0318[0...n]
**Can be changed:** C2(3)
**Data type:** FloatingPoint32
**P-Group:** Motor
**Not for motor type:** ASM, REL, FEM

**Description:**
Sets the stall current for synchronous motors (p0300 = 2xx).

**Caution:**
When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.

**Note:**
The parameter is used for the I2t monitoring of the motor (refer to p0611).
This parameter is not used for induction motors (p0300 = 1xx).
**p0319[0...n]**  Motor stall torque / Mot M_standstill

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description:</strong></td>
</tr>
<tr>
<td><strong>Caution:</strong></td>
</tr>
<tr>
<td><strong>Note:</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min</td>
<td>0.00 [Nm]</td>
</tr>
<tr>
<td>Max</td>
<td>100000.00 [Nm]</td>
</tr>
</tbody>
</table>

**p0320[0...n]**  Motor rated magnetizing current/short-circuit current / Mot I_mag_rated

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description:</strong></td>
</tr>
<tr>
<td><strong>Caution:</strong></td>
</tr>
<tr>
<td><strong>Note:</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min</td>
<td>0.000 [Arms]</td>
</tr>
<tr>
<td>Max</td>
<td>5000.000 [Arms]</td>
</tr>
</tbody>
</table>

**p0322[0...n]**  Maximum motor speed / Mot n_max

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description:</strong></td>
</tr>
<tr>
<td><strong>Dependency:</strong></td>
</tr>
<tr>
<td><strong>Caution:</strong></td>
</tr>
<tr>
<td><strong>Notice:</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min</td>
<td>0.0 [rpm]</td>
</tr>
<tr>
<td>Max</td>
<td>210000.0 [rpm]</td>
</tr>
</tbody>
</table>
### List of parameters

#### p0323[0...n]  Maximum motor current / Mot I_max

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed: C2(1, 3)</td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
</tr>
<tr>
<td>P-Group: Motor</td>
</tr>
<tr>
<td>Not for motor type: ASM, FEM</td>
</tr>
<tr>
<td>Min</td>
</tr>
<tr>
<td>Max</td>
</tr>
<tr>
<td>Factory setting</td>
</tr>
<tr>
<td>0.00 [Arms]</td>
</tr>
<tr>
<td>20000.00 [Arms]</td>
</tr>
<tr>
<td>0.00 [Arms]</td>
</tr>
</tbody>
</table>

**Description:**
Sets the maximum permissible motor current (e.g. de-magnetizing current for synchronous motors).

**Caution:**
When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.

**Notice:**
If p0323 is changed during quick commissioning (p0010 = 1), then the maximum current p0640 is pre-assigned accordingly. This is not the case when commissioning the motor (p0010 = 3).

**Note:**
The parameter has no effect for induction motors.

For synchronous motors, a value must always be entered for the maximum motor current.
p0323 is a motor data. The user-selectable current limit is entered into p0640.

#### p0324[0...n]  Winding maximum speed / Winding n_max

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed: C2(1, 3)</td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
</tr>
<tr>
<td>P-Group: Motor</td>
</tr>
<tr>
<td>Min</td>
</tr>
<tr>
<td>Max</td>
</tr>
<tr>
<td>Factory setting</td>
</tr>
<tr>
<td>0.0 [rpm]</td>
</tr>
<tr>
<td>210000.0 [rpm]</td>
</tr>
<tr>
<td>0.0 [rpm]</td>
</tr>
</tbody>
</table>

**Description:**
Sets the electrical maximum speed of the winding.

**Dependency:**
Refer to: p1082

**Caution:**
When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.

**Notice:**
If p0324 is changed during quick commissioning (p0010 = 1), then the maximum speed p1082, which is also associated with quick commissioning, is pre-assigned appropriately. This is not the case when commissioning the motor (p0010 = 3).

#### p0325[0...n]  Motor pole position identification current, 1st phase / Mot PolID I 1st ph

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed: U, T</td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
</tr>
<tr>
<td>P-Group: Motor</td>
</tr>
<tr>
<td>Not for motor type: ASM, REL, FEM</td>
</tr>
<tr>
<td>Min</td>
</tr>
<tr>
<td>Max</td>
</tr>
<tr>
<td>Factory setting</td>
</tr>
<tr>
<td>0.000 [Arms]</td>
</tr>
<tr>
<td>10000.00 [Arms]</td>
</tr>
<tr>
<td>0.000 [Arms]</td>
</tr>
</tbody>
</table>

**Description:**
Sets the current for the 1st phase of the two-stage technique for pole position identification routine.
The current of the 2nd phase is set in p0329.
The two-stage technique is selected with p1980 = 4.

**Dependency:**

**Notice:**
When the motor code (p0301) is changed, it is possible that p0325 is not pre-assigned.
p0325 can be pre-assigned using p0340 = 3.

**Note:**
The value is automatically pre-assigned for the following events:
- For p0325 = 0 and automatic calculation of the closed-loop control parameters (p0340 = 1, 2, 3).
- For quick commissioning (p3900 = 1, 2, 3).
### Parameter List

**p0326[0...n]**  
**Motor stall torque correction factor / Mot M_stall_corr**

<table>
<thead>
<tr>
<th>SERVO_S110-CAN,</th>
<th>SERVO_S110-DP,</th>
<th>SERVO_S110-PN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed: C2(3), U, T</td>
<td>Calculated: -</td>
<td>Access level: 3</td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td>Dynamic index: MDS, p0130</td>
<td>Func. diagram: -</td>
</tr>
<tr>
<td>P-Group: Motor</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type: REL, FEM</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Min 5 [%]</td>
<td>Max 300 [%]</td>
<td>Factory setting 60 [%]</td>
</tr>
</tbody>
</table>

**Description:**
Sets the correction factor for the stall torque/force at a 600 V DC link voltage.

**Caution:**
When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.

**Note:**
- When quick commissioning is exited with p3900 > 0, then the parameter is reset if a catalog motor has not been selected (refer to p0300).
- The reference value for this parameter is inversely proportional to the leakage inductance of the motor (p0353, p0354, p0356).
- The following applies for firmware version 2.6 SP2 and higher:
  - If leakage inductances are changed for motor data identification, the value in p0326 is automatically adapted to maintain the stall torque.

**p0327[0...n]**  
**Optimum motor load angle / Mot phi_load opt**

<table>
<thead>
<tr>
<th>SERVO_S110-CAN,</th>
<th>SERVO_S110-DP,</th>
<th>SERVO_S110-PN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed: C2(3), U, T</td>
<td>Calculated: -</td>
<td>Access level: 3</td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td>Dynamic index: MDS, p0130</td>
<td>Func. diagram: 5722</td>
</tr>
<tr>
<td>P-Group: Motor</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type: ASM, REL, FEM</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Min 0.0 [°]</td>
<td>Max 135.0 [°]</td>
<td>Factory setting 90.0 [°]</td>
</tr>
</tbody>
</table>

**Description:**
Sets the optimum load angle for synchronous motors with reluctance torque (e.g. 1FE ... motors).

**SERVO:** The load angle is measured at 1.5 x rated motor current.

**VECTOR:** The load angle is measured at the rated motor current.

**Dependency:**
Refer to: r1947

**Caution:**
When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.

**Note:**
- This parameter has no significance for induction motors.
- For synchronous motors without reluctance torque, a angle of 90 degrees must be set.
- When quick commissioning is exited with p3900 > 0, then the parameter is reset if a catalog motor has not been selected (refer to p0300).

**p0328[0...n]**  
**Motor reluctance torque constant / Mot kT_reluctance**

<table>
<thead>
<tr>
<th>SERVO_S110-CAN,</th>
<th>SERVO_S110-DP,</th>
<th>SERVO_S110-PN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed: C2(3), U, T</td>
<td>Calculated: -</td>
<td>Access level: 3</td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td>Dynamic index: MDS, p0130</td>
<td>Func. diagram: -</td>
</tr>
<tr>
<td>P-Group: Motor</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type: ASM, REL, FEM</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Min -1000.00 [mH]</td>
<td>Max 1000.00 [mH]</td>
<td>Factory setting 0.00 [mH]</td>
</tr>
</tbody>
</table>

**Description:**
Sets the reluctance torque constant for synchronous motors with reluctance torque (e.g. 1FE ... motors).

**Dependency:**
Refer to: r1939

**Caution:**
When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.

**Note:**
For synchronous motors without reluctance torque, the value 0 must be set.
### p0329[0...n]  Motor pole position identification current / Mot PolID current

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Can be changed:</strong> C2(3), U, T</td>
</tr>
<tr>
<td><strong>Data type:</strong> FloatingPoint32</td>
</tr>
<tr>
<td><strong>P-Group:</strong> Motor</td>
</tr>
<tr>
<td><strong>Not for motor type:</strong> ASM, REL, FEM</td>
</tr>
<tr>
<td><strong>Min</strong></td>
</tr>
<tr>
<td>0.00 [Arms]</td>
</tr>
</tbody>
</table>

**Description:**
Sets the current for the pole position identification routine.
For a two-stage technique, the current is set for the 2nd phase.

**Dependency:**
Refer to: F07995

**Caution:**
When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.

### r0330[0...n]  Rated motor slip / Mot slip_rated

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Can be changed:</strong> -</td>
</tr>
<tr>
<td><strong>Data type:</strong> FloatingPoint32</td>
</tr>
<tr>
<td><strong>P-Group:</strong> Motor</td>
</tr>
<tr>
<td><strong>Not for motor type:</strong> PEM, REL, FEM</td>
</tr>
<tr>
<td><strong>Min</strong></td>
</tr>
<tr>
<td>- [Hz]</td>
</tr>
</tbody>
</table>

**Description:**
Displays the rated motor slip.

**Dependency:**
The rated slip is calculated from the rated frequency, rated speed and number of pole pairs.
Refer to: p0310, p0311, r0313

**Note:**
The parameter is not used for synchronous motors (p0300 = 2xx).

### r0331[0...n]  Actual motor magnetizing current/short-circuit current / Mot I_mag_rtd act

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Can be changed:</strong> -</td>
</tr>
<tr>
<td><strong>Data type:</strong> FloatingPoint32</td>
</tr>
<tr>
<td><strong>P-Group:</strong> Motor</td>
</tr>
<tr>
<td><strong>Not for motor type:</strong> REL, FEM</td>
</tr>
<tr>
<td><strong>Min</strong></td>
</tr>
<tr>
<td>- [Arms]</td>
</tr>
</tbody>
</table>

**Description:**
Induction motor:
Displays the rated magnetizing current from p0320.
For p0320 = 0, the internally calculated magnetizing current is displayed.
Synchronous motor:
Displays the rated short-circuit current from p0320.

**Dependency:**
If p0320 was not entered, then the parameter is calculated from the rating plate parameters.

**Note:**
In the case of multi-motor operation r0331 is increased by the factor p0306 compared to p0320.

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SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3

1-83
### r0332[0...n] Rated motor power factor / Mot cos_phi_rated

| Description: | Displays the rated power factor for induction motors. For IEC motors, the following applies (p0100 = 0): For p0308 = 0, the internally-calculated power factor is displayed. For p0308 > 0, this value is displayed. For NEMA motors, the following applies (p0100 = 1): For p0309 = 0, the internally-calculated power factor is displayed. For p0309 > 0, this value is converted into the power factor and displayed. |
|Dependency: | If p0308 is not entered, the parameter is calculated from the rating plate parameters. Note: The parameter is not used for synchronous motors (p0300 = 2xx). |

### r0333[0...n] Rated motor torque / Mot M_rated

| Description: | Displays the rated motor torque. Dependency: IEC drives (p0100 = 0): unit Nm NEMA drives (p0100 = 1): unit lbf ft Note: For induction and reluctance motors, r0333 is calculated from p0307 and p0311. For synchronous motors, r0333 is calculated from p0305, p0316, p0327 and p0328. The result can deviate from the input in p0312. If p0316 = 0, then r0333 = p0312 is displayed. In the case of multi-motor operation r0333 is increased by the factor p0306 compared to the rated torque of an individual motor. |

### r0334[0...n] Actual motor-torque constant / Mot kT act

| Description: | Displays the torque constant of the synchronous motor used. Dependency: IEC drives (p0100 = 0): unit Nm / A NEMA drives (p0100 = 1): unit lbf ft / A Refer to: p0316 Note: This parameter is not used for induction motors (p0300 = 1xx). For synchronous motors, parameter r0334 = p0316 is displayed. If p0316 = 0, r0334 is calculated from p0305 and p0312. |
**p0335[0...n]**  
Motor cooling type / Motor cooling type

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

Can be changed: C2(1, 3), T  
Data type: Integer16  
P-Group: Motor  
Not for motor type: PEM, REL, FEM

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>128</td>
<td>0</td>
</tr>
</tbody>
</table>

**Description:** Sets the motor cooling system used.

**Value:**
- 0: Non-ventilated
- 1: Forced cooling
- 2: Liquid cooling
- 4: Non-ventilated and internal fan
- 5: Forced cooling and internal fan
- 6: Liquid cooling and internal fan
- 128: No fan

**Dependency:**
For 1LA5 and 1LA7 motors (refer to p0300), the parameter is pre-set as a function of p0307 and p0311.

**Caution:**
When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.

**Note:**
The parameter influences the thermal 3-mass motor model.

1LA1 and 1LA8 motors are characterized by the fact that they have an internal rotor fan. This "internal cooling" lies within the motor frame and is not visible. Air is not directly exchanged with the motor ambient air. For 1PQ8 motors, p0335 should be set to 5 as these motors are force-ventilated motors.

1LA7 motors, frame size 56 are operated without fan.

**r0336[0...n]**  
Actual rated motor frequency / Mot f_rated act

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

Can be changed: -  
Data type: Float[ing]Point32  
P-Group: Motor  
Not for motor type: -

Min - [Hz]  
Max - [Hz]

**Description:**
Displays the rated frequency of the motor.

**Value:**
- For p0310 > 0, this value is displayed.

**Dependency:**
Refer to: p0311, p0314

**Note:**
- For p0310 = 0 or for synchronous motors, the rated motor frequency r0336 is calculated from the rated speed and the pole pair number.
- For p0310 > 0, this value is displayed (not for synchronous motors).

**r0337[0...n]**  
Rated motor EMF / Mot EMF_rated

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

Can be changed: -  
Data type: Float[ing]Point32  
P-Group: Motor  
Not for motor type: REL

Min - [Vrms]  
Max - [Vrms]

**Description:**
Displays the rated EMF of the motor.

**Value:**
- EMF: Electromagnetic force

**Dependency:**
Refer to: p0311, p0314

**Note:**
- For p0310 = 0 or for synchronous motors, the rated EMF is calculated from the rated speed and the pole pair number.
- For p0310 > 0, this value is displayed (not for synchronous motors).
**Parameter**

**List of parameters**

### p0338[0...n] Motor limit current / Mot I_limit

**Description:**
Sets the motor limit current for synchronous motors (for a 600 V DC link voltage).

**Caution:**
When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.

**Notice:**
If p0338 is changed during quick commissioning (p0010 = 1), then the maximum current p0640 is appropriately pre-assigned. This is not the case when commissioning the motor (p0010 = 3).

### r0339[0...n] Rated motor voltage / Mot U_rated

**Description:**
Displays the rated motor voltage.

**Note:**
For induction motors (p0300 = 1xx) the parameter is set to p0304.
For synchronous motors, parameter r0339 = p0304 is displayed. If p0304 = 0, then r0339 is calculated from p0305 and p0316.

### p0340[0...n] Automatic calculation, motor/control parameters / Calc auto par

**Description:**
Setting to automatically calculate motor parameters and U/f open-loop and closed-loop control parameters from the rating plate data.

**Value:**
0: No calculation  
1: Complete calculation  
2: Calculation of equivalent circuit diagram parameters  
3: Calculation of closed-loop control parameters  
4: Calculation of controller parameters  
5: Calculation of technological limits and threshold values

**Notice:**
After the value has been modified, no further parameter modifications can be made and the status is shown in r3996. Modifications can be made again when r3996 = 0.

The following parameters are influenced using p0340:  
The parameters designated with (*) are not overwritten for catalog motors (p0300 > 100).

SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

#### p0340 = 1:
- All of the parameters influenced for p0340 = 2, 3, 4, 5
- p0341 (*)
- p0340 = 2:
- p0350 (*), p0354 (*), p0356 (*), p0358 (*), p0360 (*)
- p0625 (matching p0350)
p0340 = 3:
--> All of the parameters influenced for p0340 = 4, 5
--> p0325 (is only calculated for p0325 = 0)
--> p0348 (*) (is only calculated for p0348 = 0)
--> p0441, p0442, p0443, p0444, p0445 (only for 1FT6, 1FK6, 1FK7 motors)
--> p0492, p1082, p1980, p1319, p1326, p1327, p1612, p1752, p1755
p0340 = 4:
--> p1461 (for p0348 > p0322, p1461 is set to 100 %)
--> p1463 (for p0348 > p0322, p1463 is set to 400 %)
p0340 = 5:
--> p1037, p1038, p1520, p1521, p1530, p1531, p2140 ... p2142, p2148, p2150, p2155, p2161, p2162, p2163, p2164, p2175, p2177, p2194, p3820 ... p3829
VECTOR:
p0340 = 1:
--> All of the parameters influenced for p0340 = 2, 3, 4, 5
--> p0341 (*)
p0340 = 2:
--> p0350 (*), p0354 ... p0361 (*), p0652 ... p0660
--> p0625 (matching p0350)
p0340 = 3:
--> All of the parameters influenced for p0340 = 4, 5
--> p0346, p0347, p0492, p0622, p1262, p1320 ... p1327, p1582, p1584, p1612, p1616, p1744, p1748, p1749, p1755, p1756, p2178
p0340 = 4:
p0340 = 5:
p0340 = 1 contains the calculations of p0340 = 2, 3, 4, 5 without overwriting the motor parameters from the Siemens motor lists (p0301 > 0).
p0340 = 2 calculates the motor parameters (p0350 ... p0360), but only if it does involve a Siemens catalog motor (p0301 = 0).
p0340 = 3 contains the calculations of p0340 = 4, 5.
p0340 = 4 only calculates the controller parameters.
p0340 = 5 only calculates the controller limits.
When quick commissioning is exited using p3900 > 0, p0340 is automatically set to 1.
At the end of the calculations, p0340 is automatically set to 0.
If the STARTER commissioning software writes a 3 into p0340 when "downloading to target device", then this corresponds to a "complete calculation of the motor/control parameters without equivalent circuit diagram data“. The same calculations are carried out as for p0340 = 1, however, without the equivalent circuit diagram parameters of the motor (p0340 = 2), the motor moment of inertia (p0341) and the motor weight (p0344).
### List of parameters

#### Parameter

**p0341[0...n] Motor moment of inertia / Mot M_mom of inert**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
</table>
| SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN | Sets the motor moment of inertia (without load). | IEC drives (p0100 = 0): unit kg m²  
NEMA drives (p0100 = 1): unit lb ft²  
The parameter value is included, together with p0342, in the rated starting time of the motor.  
Refer to: p0342 | When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.  
p0341 * p0342 + p1498 influence the speed/torque pre-control in encoderless operation. |
| Can be changed: C2(3), T | Calculated: CALC_MOD_ALL  
Access level: 3 | Func. diagram: 5042, 5210  
Unit selection: p0100 |  |
| Data type: FloatingPoint32 | Dynamic index: MDS, p0130  
Units group: 25_1  
Expert list: 1 | |  |
| P-Group: Motor | Scaling: -  
Factory setting | |  |
| Not for motor type: REL | Min 0.000000 [kgm²]  
Max 100000.000000 [kgm²]  
Factory setting 0.000000 [kgm²] | |  |

**p0342[0...n] Ratio between the total and motor moment of inertia / Mot MomInert Ratio**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
</table>
| SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN | Sets the ratio between the total moment of inertia/mass (load + motor) and the intrinsic motor moment of iner-  
tia/mass (no load). | Refer to: p0341, p1498 |  |
| Can be changed: C2(3), T | Calculated: CALC_MOD_ALL  
Access level: 3 | Func. diagram: 5042, 5210  
Unit selection: - |  |
| Data type: FloatingPoint32 | Dynamic index: MDS, p0130  
Units group: -  
Expert list: 1 | |  |
| P-Group: Motor | Scaling: -  
Factory setting | |  |
| Not for motor type: REL | Min 1.000  
Max 10000.000  
Factory setting 1.000 | |  |

**p0344[0...n] Motor weight (for the thermal motor model) / Mot weight th mod**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
</table>
| SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN | Sets the motor weight. | IEC drives (p0100 = 0): unit kg  
NEMA drives (p0100 = 1): unit lb  
The parameter value is included, together with p0300, in the rated starting time of the motor.  
Refer to: p0300 | When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.  
The parameter influences the thermal 3 mass model of the induction motor.  
The parameter is not used for synchronous motors (p0300 = 2xx). |
| Can be changed: C2(3), T | Calculated: CALC_MOD_REG  
Access level: 3 | Func. diagram: -  
Unit selection: - |  |
| Data type: FloatingPoint32 | Dynamic index: MDS, p0130  
Units group: 27_1  
Expert list: 1 | |  |
| P-Group: Motor | Scaling: -  
Factory setting | |  |
| Not for motor type: PEM, REL, FEM | Min 0.0 [kg]  
Max 50000.0 [kg]  
Factory setting 0.0 [kg] | |  |

**p0347[0...n] Motor de-excitation time / Mot t_de-excitat.**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
</table>
| SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN | Sets the de-magnetizing time (for induction motors) after the inverter pulses have been canceled.  
The inverter pulses cannot be switched in (enabled) within this delay time. |  |  |
For SERVO, the de-excitation time is only used for DC current braking.

The parameter is calculated using p0340 = 1, 3.

For induction motors, the result depends on the rotor time constant (r0384).

if this time is shortened too much, then this can result in an inadequate de-magnetizing of the induction motor and in an overcurrent condition when the pulses are subsequently enabled (only when the flying restart function is activated and the motor is rotating).

### p0348[0...n] Speed at the start of field weakening Vdc = 600 V / Mot n_field weaken

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Dependency</th>
<th>Caution</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type: FloatingPoint32</td>
<td>Dynamic index: MDS, p0130</td>
<td>Unit selection: -</td>
<td>Func. diagram: 5722</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P-Group: Motor</td>
<td>Units group: -</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0 [rpm]</td>
<td>210000.0 [rpm]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factory setting</td>
<td>0.0 [rpm]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Description:
Sets the speed at the start of field weakening for a DC link voltage of 600 V.

#### Dependency:
Refer to: p0320, r0331

#### Caution:
When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.

### p0349 System of units, motor equivalent circuit diagram data / Unit_sys mot ESB

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Dependency</th>
<th>Caution</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Can be changed: C2(3)</td>
<td>Calculated: -</td>
<td>Access level: 1</td>
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<td>Unit selection: -</td>
<td>Func. diagram: -</td>
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<tr>
<td>P-Group: Motor</td>
<td>Units group: -</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Min</td>
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<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Description:
Sets the actual system of units for motor equivalent circuit diagram data.

#### Value:
1: System of units, physical

#### Dependency:
Refer to: p0304, p0305, p0310

#### Note:
The reference parameter for resistances of the rated motor impedance Z = p0304 / (1.732 * p0305) is in the % units system.

Inductances are converted into a resistance using the factor 2 * Pi * p0310.

If a reference parameter (p0304, p305, p0310) is zero, then it is not possible to make a changeover to "referred" values (per unit values).

### p0350[0...n] Motor stator resistance, cold / Mot R_stator cold

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Dependency</th>
<th>Caution</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type: FloatingPoint32</td>
<td>Dynamic index: MDS, p0130</td>
<td>Unit selection: p0349</td>
<td>Func. diagram: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P-Group: Motor</td>
<td>Units group: 16_1</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.00000 [ohm]</td>
<td>2000.00000 [ohm]</td>
<td>0.00000 [ohm]</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Description:
Sets the stator resistance of the motor at ambient temperature p0625.

#### Dependency:
Refer to: p0625, r1912

#### Caution:
When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.

#### Note:
The motor identification routine determines the stator resistance from the total stator resistance minus the cable resistance (p0352).
### List of parameters

**p0352[0...n]**  
**Cable resistance / Mot R\_cable cold**

- **SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**
- **Can be changed:** C2(3), U, T
- **Data type:** FloatingPoint32
- **P-Group:** Motor
- **Not for motor type:** -
- **Min:** 0.00000 [ohm]
- **Max:** 120.00000 [ohm]
- **Factory setting:** 0.00000 [ohm]
- **Access level:** 3
- **Dynamic index:** MDS, p0130
- **Units group:** 16_1
- **Unit selection:** p0349
- **Expert list:** 1
- **Func. diagram:** -

**Description:** Resistance of the power cable between the Motor Module and motor.

**Caution:**

- The cable resistance should be entered prior to motor data identification. If it is used subsequently, the difference by which p0352 was changed must be subtracted from the stator resistance p0350 or motor data identification must be repeated.

**Note:**

- The parameter influences the temperature adaptation of the stator resistance.
- The motor identification routine does not change the cable resistance. This is subtracted from the total measured stator resistance in order to calculate the stator resistance (p0350, p0352).
- The cable resistance is reset when quick commissioning is exited with p3900 > 0.

**p0353[0...n]**  
**Motor series inductance / Mot L\_series**

- **SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**
- **Can be changed:** C2(3), U, T
- **Data type:** FloatingPoint32
- **P-Group:** Motor
- **Not for motor type:** -
- **Min:** 0.000 [mH]
- **Max:** 1000000.000 [mH]
- **Factory setting:** 0.000 [mH]
- **Access level:** 2
- **Dynamic index:** MDS, p0130
- **Units group:** 15_1
- **Unit selection:** p0349
- **Expert list:** 1
- **Func. diagram:** -

**Description:** Sets the series inductance.

**Note:**

- For the automatic calculation with p0340 = 1 or 3, the calculation of p0348 is influenced by p0353 if p0348 was 0.
- For the automatic calculation with p0340 = 1, 3 or 4, the calculation of p1715 is influenced by p0353.
- The series inductance is reset when quick commissioning is exited with p3900 > 0.

**p0354[0...n]**  
**Motor rotor resistance cold / damping resistance d axis / Mot R\_r cold/R\_D d**

- **SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**
- **Can be changed:** C2(3), U, T
- **Data type:** FloatingPoint32
- **P-Group:** Motor
- **Not for motor type:** PEM, REL
- **Min:** 0.00000 [ohm]
- **Max:** 300.00000 [ohm]
- **Factory setting:** 0.00000 [ohm]
- **Access level:** 3
- **Dynamic index:** CALC_MOD_EQU
- **Units group:** 16_1
- **Unit selection:** p0130
- **Expert list:** 1
- **Func. diagram:** -

**Description:** Sets the rotor/secondary section resistance of the motor at the ambient temperature p0625.

**Dependency:**

- Refer to: p0625

**Caution:**

- When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.

**Note:**

- The parameter is not used for synchronous motors (p0300 = 2xx).
- The reference value for p0326 is inversely proportional to the leakage inductance of the motor (p0353, p0354, p0356).
### p0356[0...n] Motor stator leakage inductance / Mot L_stator leak.

- **Can be changed:** C2(3), U, T  
- **Data type:** FloatingPoint32  
- **P-Group:** Motor  
- **Min:** 0.00000 [mH]  
- **Max:** 1000.00000 [mH]  
- **Factory setting:** 0.00000 [mH]

**Description:**
Induction motor, separately-excited synchronous motor: Sets the rotor leakage inductance of the motor.

Synchronous motor: Sets the stator quadrature axis inductance of the motor.

This parameter value is automatically calculated using the motor model (p0340 = 1, 2) or using the motor identification routine (p1910).

**Caution:**
When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.

**Note:**
The reference value for p0326 is inversely proportional to the leakage inductance of the motor (p0353, p0354, p0356).

### p0358[0...n] Motor rotor leakage inductance / damping inductance, d axis / Mot L_r leak / LDd

- **Can be changed:** C2(3), U, T  
- **Data type:** FloatingPoint32  
- **P-Group:** Motor  
- **Min:** 0.00000 [mH]  
- **Max:** 1000.00000 [mH]  
- **Factory setting:** 0.00000 [mH]

**Description:**
Sets the rotor/secondary section leakage inductance of the motor.

For separately-excited synchronous motors: Sets the damping inductance in the rotor direction (d-axis).

This value is automatically calculated using the motor model (p0340 = 1, 2) or using the motor identification routine (p1910) (not for separately-excited synchronous motors).

**Caution:**
When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.

**Note:**
The parameter is not used for synchronous motors (p0300 = 2xx).

VECTOR:
If the rotor leakage inductance (p0358) for induction motors is changed outside the commissioning phase (p0010 > 0), then the magnetizing inductance (p0360) is automatically adapted to the new EMF (r0337). You are then advised to repeat the measurement for the saturation characteristic (p1960).

### p0360[0...n] Motor magnetizing inductance/magn. inductance, d axis saturated / Mot Lh/Lh d sat

- **Can be changed:** C2(3), U, T  
- **Data type:** FloatingPoint32  
- **P-Group:** Motor  
- **Min:** 0.00000 [mH]  
- **Max:** 10000.00000 [mH]  
- **Factory setting:** 0.00000 [mH]

**Description:**
Sets the magnetizing inductance of the motor.

For separately-excited synchronous motors: Sets the saturated magnetizing inductance in the rotor direction (d-axis).

This parameter value is automatically calculated using the motor model (p0340 = 1, 2) or using the motor identification routine (p1910) (not for separately-excited synchronous motors).

**Caution:**
When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.

**Note:**
The parameter is not used for synchronous motors (p0300 = 2xx).
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>r0370[0...n]</strong> Motor stator resistance, cold / Mot R_stator cold</td>
<td>Displays the motor stator resistance at an ambient temperature (p0625). The value does not include the cable resistance.</td>
<td>Refer to: p0625</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>The parameter is not used for synchronous motors (p0300 = 2xx).</td>
</tr>
<tr>
<td><strong>r0373[0...n]</strong> Motor rated stator resistance / Mot R_stator rated</td>
<td>Displays the rated motor stator resistance at rated temperature (total of p0625 and p0627).</td>
<td>Refer to: p0627</td>
<td></td>
</tr>
<tr>
<td><strong>r0374[0...n]</strong> Motor rotor resistance cold / damping resistance d axis / Mot R_r cold / RDd</td>
<td>Displays the rotor/secondary section resistance of the motor for the ambient temperature p0625. For separately-excited synchronous motors: Displays the damping resistance in the rotor direction (d-axis).</td>
<td>Refer to: p0625</td>
<td></td>
</tr>
<tr>
<td><strong>r0376[0...n]</strong> Rated motor rotor resistance / Mot RRotor rated</td>
<td>Displays the rated (nominal) rotor/secondary section resistance of the motor at the rated temperature (total of p0625 and p0628).</td>
<td>Refer to: p0628</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>The parameter is not used for synchronous motors (p0300 = 2xx).</td>
</tr>
</tbody>
</table>
### List of parameters

**r0377[0...n]**  
**Motor leakage inductance, total / Mot L_leak total**

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

<table>
<thead>
<tr>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>4</td>
</tr>
</tbody>
</table>

**Data type:** FloatingPoint32  
**P-Group:** Motor  
**Not for motor type:** -  
**Min**
- [-mH]  
**Max**
- [-mH]

**Description:**  
Induction motor: Displays the stator leakage inductance of the motor including the series inductance (p0353).  
Synchronous motor: Displays the stator quadrature axis inductance of the motor including the series inductance (p0353).

**Note:**  
The parameter is not used for synchronous motors (p0300 = 2xx).

**r0382[0...n]**  
**Motor magnetizing inductance transformed / Lh d axis saturated / Mot L_m tr/Lhd sat**

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

<table>
<thead>
<tr>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>4</td>
</tr>
</tbody>
</table>

**Data type:** FloatingPoint32  
**P-Group:** Motor  
**Not for motor type:** PEM, REL  
**Min**
- [-mH]  
**Max**
- [-mH]

**Description:**  
Displays the magnetizing inductance of the motor.  
For separately-excited synchronous motors: Displays the saturated magnetizing inductance in the rotor direction (d-axis).

**Note:**  
The parameter is not used for synchronous motors (p0300 = 2xx).

**r0384[0...n]**  
**Motor rotor time constant / damping time constant d axis / Mot T_rotor/T_Dd**

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

<table>
<thead>
<tr>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>4</td>
</tr>
</tbody>
</table>

**Data type:** FloatingPoint32  
**P-Group:** Motor  
**Not for motor type:** PEM, REL  
**Min**
- [ms]  
**Max**
- [ms]

**Description:**  
Displays the rotor time constant.  
For separately-excited synchronous motors: Displays the damping time constant in the rotor direction (d-axis).

**Note:**  
The parameter is not used for synchronous motors.

**The value is calculated from the total of the inductances on the rotor side (p0358, p0360) divided by the rotor/damping resistance (p0354). The temperature adaptation of the rotor resistance for induction motors is not taken into account.**

**r0386[0...n]**  
**Motor stator leakage time constant / Mot T_stator leak**

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

<table>
<thead>
<tr>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>4</td>
</tr>
</tbody>
</table>

**Data type:** FloatingPoint32  
**P-Group:** Motor  
**Not for motor type:** -  
**Min**
- [ms]  
**Max**
- [ms]

**Description:**  
Displays the stator leakage time constant.

**Note:**  
The value is calculated from the total of all leakage inductances (p0233*, p0353, p0356, p0358) divided by the total of all motor resistances (p0350, p0352, p0354). The temperature adaptation of the resistances is not taken into account.  
* only applies for VECTOR (r0107).
### p0391[0...n]

**Current controller adaptation, starting point KP / I adapted pt KP**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Caution</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Can be changed:</strong> C2(3), U, T</td>
<td>Sets the starting point of the current-dependent current controller adaptation where the current controller gain p1715 is effective.</td>
<td>Refer to: p0392, p0393, p1402, p1715</td>
<td>When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.</td>
<td>For p0393 = 100 % or p1402.2 = 0, the current controller adaptation is disabled and p1715 is effective over the entire range.</td>
</tr>
<tr>
<td><strong>Data type:</strong> FloatingPoint32</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>P-Group:</strong> Motor</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Not for motor type:</strong> REL</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Min</strong></td>
<td>0.00 [Arms]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Max</strong></td>
<td>6000.00 [Arms]</td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>Value</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Expert list:</strong> 1</td>
<td></td>
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</tr>
</tbody>
</table>

**Description:**
Sets the starting point of the current-dependent current controller adaptation where the current controller gain p1715 is effective.

**Dependency:**
Refer to: p0392, p0393, p1402, p1715

**Caution:**
When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.

**Note:**
For p0393 = 100 % or p1402.2 = 0, the current controller adaptation is disabled and p1715 is effective over the entire range.

### p0392[0...n]

**Current controller adaptation, starting point KP adapted / I adapt pt KP adap**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Caution</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Can be changed:</strong> C2(3), U, T</td>
<td>Sets the starting point of the current-dependent current controller adaptation where the adapted current controller gain p1715 x p0393 is effective.</td>
<td>Refer to: p0391, p0393, p1402, p1715</td>
<td>When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.</td>
<td>For p0393 = 100 % or p1402.2 = 0, the current controller adaptation is disabled and p1715 is effective over the entire range.</td>
</tr>
<tr>
<td><strong>Data type:</strong> FloatingPoint32</td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>P-Group:</strong> Motor</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Not for motor type:</strong> REL</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Min</strong></td>
<td>0.00 [Arms]</td>
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<tr>
<td><strong>Max</strong></td>
<td>6000.00 [Arms]</td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>Value</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Expert list:</strong> 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:**
Sets the starting point of the current-dependent current controller adaptation where the adapted current controller gain p1715 x p0393 is effective.

**Dependency:**
Refer to: p0391, p0393, p1402, p1715

**Caution:**
When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.

**Note:**
For p0393 = 100 % or p1402.2 = 0, the current controller adaptation is disabled and p1715 is effective over the entire range.

### p0393[0...n]

**Current controller adaptation p gain adaptation / I adapt Kp adapt**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Caution</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Can be changed:</strong> C2(3), U, T</td>
<td>Sets the factor for the current controller P gain in the adaptation range (current &gt; p0392). The value is referred to p1715.</td>
<td>Refer to: p0391, p0392, p1402, p1715</td>
<td>When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.</td>
<td>For p0393 = 100 % or p1402.2 = 0, the current controller adaptation is disabled and p1715 is effective over the entire range.</td>
</tr>
<tr>
<td><strong>Data type:</strong> FloatingPoint32</td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>P-Group:</strong> Motor</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Not for motor type:</strong> REL</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Min</strong></td>
<td>0.00 [%]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Max</strong></td>
<td>1000.00 [%]</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:**
Sets the factor for the current controller P gain in the adaptation range (current > p0392).

**Dependency:**
Refer to: p0391, p0392, p1402, p1715

**Caution:**
When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.

**Note:**
For p0393 = 100 % or p1402.2 = 0, the current controller adaptation is disabled and p1715 is effective over the entire range.
### Parameter List of parameters

#### r0395[0...n]
**Actual stator resistance / R_stator act**
- **Can be changed:** -
- **Data type:** FloatingPoint32
- **P-Group:** Motor
- **Not for motor type:** -
- **Min:** - [ohm]
- **Access level:** 3
- **Description:** Displays the actual stator resistance (phase value).
- **Dependency:** In the case of induction motors the parameter is also affected by the motor temperature model.
- **Note:** In each case, only the stator resistance of the active Motor Data Set is included with the stator temperature of the thermal motor model.

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No encoder</td>
</tr>
<tr>
<td>202</td>
<td>DRIVE-CLiQ encoder AS20, singleturn</td>
</tr>
<tr>
<td>204</td>
<td>DRIVE-CLiQ encoder AM20, multiturn 4096</td>
</tr>
<tr>
<td>242</td>
<td>DRIVE-CLiQ encoder AS24, singleturn</td>
</tr>
<tr>
<td>244</td>
<td>DRIVE-CLiQ encoder AM24, multiturn 4096</td>
</tr>
<tr>
<td>1001</td>
<td>Resolver 1 speed</td>
</tr>
<tr>
<td>1002</td>
<td>Resolver 2 speed</td>
</tr>
<tr>
<td>1003</td>
<td>Resolver 3 speed</td>
</tr>
<tr>
<td>1004</td>
<td>Resolver 4 speed</td>
</tr>
<tr>
<td>2001</td>
<td>2048, 1 Vpp, A/B C/D R</td>
</tr>
<tr>
<td>2002</td>
<td>2048, 1 Vpp, A/B R</td>
</tr>
<tr>
<td>2003</td>
<td>256, 1 Vpp, A/B R</td>
</tr>
<tr>
<td>2004</td>
<td>400, 1 Vpp, A/B R</td>
</tr>
<tr>
<td>2005</td>
<td>512, 1 Vpp, A/B R</td>
</tr>
<tr>
<td>2006</td>
<td>192, 1 Vpp, A/B R</td>
</tr>
<tr>
<td>2007</td>
<td>480, 1 Vpp, A/B R</td>
</tr>
<tr>
<td>2008</td>
<td>800, 1 Vpp, A/B R</td>
</tr>
<tr>
<td>2010</td>
<td>18000, 1 Vpp, A/B R distance-coded</td>
</tr>
</tbody>
</table>

#### r0396[0...n]
**Actual rotor resistance / RRotor act**
- **Can be changed:** -
- **Data type:** FloatingPoint32
- **P-Group:** Motor
- **Not for motor type:** PEM, REL, FEM
- **Min:** - [ohm]
- **Access level:** 3
- **Description:** Displays the actual rotor/secondary section resistance (phase value).
- **Dependency:** In each case, only the rotor resistance of the active Motor Data Set is included with the rotor temperature of the thermal motor model.
- **Note:** This parameter is not used for synchronous motors (p0300 = 2xx).

#### p0400[0...n]
**Encoder type selection / Enc_typ sel**
- **Can be changed:** C2(1, 4)
- **Data type:** Integer16
- **P-Group:** Encoder
- **Value:**
  - 0: No encoder
  - 202: DRIVE-CLiQ encoder AS20, singleturn
  - 204: DRIVE-CLiQ encoder AM20, multiturn 4096
  - 242: DRIVE-CLiQ encoder AS24, singleturn
  - 244: DRIVE-CLiQ encoder AM24, multiturn 4096
  - 1001: Resolver 1 speed
  - 1002: Resolver 2 speed
  - 1003: Resolver 3 speed
  - 1004: Resolver 4 speed
  - 2001: 2048, 1 Vpp, A/B C/D R
  - 2002: 2048, 1 Vpp, A/B R
  - 2003: 256, 1 Vpp, A/B R
  - 2004: 400, 1 Vpp, A/B R
  - 2005: 512, 1 Vpp, A/B R
  - 2006: 192, 1 Vpp, A/B R
  - 2007: 480, 1 Vpp, A/B R
  - 2008: 800, 1 Vpp, A/B R
  - 2010: 18000, 1 Vpp, A/B R distance-coded
- **Access level:** 1
- **Dependency:** Refer to: p0354, p0620
Parameter

List of parameters

2051: 2048, 1 Vpp, A/B, EnDat, Multiturn 4096
2052: 32, 1 Vpp, A/B, EnDat, Multiturn 4096
2053: 512, 1 Vpp, A/B, EnDat, Multiturn 4096
2054: 16, 1 Vpp, A/B, EnDat, Multiturn 4096
2055: 2048, 1 Vpp, A/B, EnDat, Singleturn
2081: 2048, 1 Vpp, A/B, SSI, Singleturn
2082: 2048, 1 Vpp, A/B, SSI, Multiturn 4096
2083: 2048, 1 Vpp, A/B, SSI, singleturn, error bit
2084: 2048, 1 Vpp, A/B, SSI, multiturn 4096, error bit
3001: 1024 HTL A/B R
3002: 1024 TTL A/B R
3003: 2048 HTL A/B R
3005: 1024 HTL A/B
3006: 1024 TTL A/B
3007: 2048 HTL A/B
3008: 2048 TTL A/B
3009: 1024 HTL A/B unipolar
3011: 2048 HTL A/B unipolar
3200: 2048 TTL A/B R, with sense
3081: SSI, Singleturn, 24 V
3082: SSI, Multiturn 4096, 24 V
3090: 4096, HTL, A/B, SSI, Singleturn
9000: Pulse encoder s_set
9001: Pulse encoder n_set
9999: User-defined
10000: Identify encoder
10050: Encoder with EnDat interface identified
10051: DRIVE-CLiQ encoder identified
10100: Identify encoder (waiting)

Caution: An encoder type with p0400 < 9000 defines an encoder for which there is an encoder parameter list. When selecting a catalog encoder (p0400 < 9000) the parameters from the encoder parameter list cannot be changed (write protection). To remove write protection, the encoder type should be set to a third-party encoder (p0400 = 9999).

Notice: If required, the list of motor codes/encoder codes can be found in the Appendix of the List Manual.

Note: The connected encoder can be identified by setting p0400 to 10000 or 10100. This assumes that the encoder supports this method, which is possible in the following cases: Motor with DRIVE-CLiQ, encoder with EnDat interface, DRIVE-CLiQ encoder.

The encoder data (e.g. pulse number p0408) can only be changed when p0400 = 9999.

When using an encoder with track A/B and zero pulse, as standard, fine synchronization is not set using a zero mark. If, for a synchronous motor, fine synchronization is to be realized using a zero mark, then the following must be executed:
- set p0400 to 9999
- set p0404.15 to 1

Prerequisite:
Coarse synchronization must be selected (e.g. pole position identification) and the zero pulse of the encoder must be either mechanically or electronically (p0431) adjusted to the pole position.

For p0400 = 10000 the following applies:
If an identification is not possible, then p0400 is set to 0.

For p0400 = 10100 the following applies:
If an identification is not possible, p0400 remains set to 10100 until it becomes possible.
For p0400 = 9000, 9001 the following applies:
- for p0400 = 9000 and p0184 > 0 the following BICO interconnection is established: CI: p2530 = CO: r2531
- for p0400 = 9001 and p0184 > 0 the following BICO interconnection is established: CI: p1155 = CO: r0061
- write protection for the parameters from the encoder parameter list is lifted
- check the encoder parameters and make any necessary corrections
**Parameter List**

**p0401[0...n]** Encoder type, OEM selection / Enc type OEM sel

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Selects the encoder from the list of encoder types that the OEM supports.</td>
<td>C2(1, 4)</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>Data type:</td>
<td>Integer16</td>
<td>Dynamic index: EDS, p0140</td>
<td>Func. diagram: 1580, 4704</td>
<td></td>
</tr>
<tr>
<td>P-Group:</td>
<td>Encoder</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
<td></td>
</tr>
</tbody>
</table>

**Description:**
Selects the encoder from the list of encoder types that the OEM supports.

**Note:**
The connected encoder can be identified by p0400 = 10000. This means that the encoder must support this and is possible in the following cases: Motor with DRIVE-CLiQ, encoder with EnDat interface.

If an identification is not possible, then p0400 is set to 0.

The encoder data (e.g. pulse number p0408) can only be changed when p0400 = 9999.
Using p0400 = 20000, the encoder type can be selected from the list of OEM encoders using p0401.

**p0404[0...n]** Encoder configuration effective / Enc_config eff

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Settings for the basic encoder properties.</td>
<td>C2(4)</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>Data type:</td>
<td>Unsigned32</td>
<td>Dynamic index: EDS, p0140</td>
<td>Func. diagram: 4010, 4704</td>
<td></td>
</tr>
<tr>
<td>P-Group:</td>
<td>Encoder</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
<td></td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
</tr>
</tbody>
</table>

**Description:**
Settings for the basic encoder properties.

<table>
<thead>
<tr>
<th>Bit field:</th>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Linear encoder</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>01</td>
<td>Abs value encoder</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>02</td>
<td>Multiturn encoder</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>03</td>
<td>Track A/B sq-wave</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>04</td>
<td>Track A/B sinus</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>05</td>
<td>Track C/D</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>06</td>
<td>Hall sensor</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>08</td>
<td>EnDat encoder</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>09</td>
<td>SSI encoder</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>DRIVE-CLiQ encoder</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Digital encoder</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Equidistant zero mark</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Irregular zero mark</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Distance-coded zero mark</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Commutation with zero mark (not ASM)</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Acceleration</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Track A/B analog</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Voltage level 5 V</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Voltage level 24 V</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Remote sense (only SMC30)</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Resolver exc.</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

**Caution:**
This parameter is automatically pre-set for encoders from the encoder list (p0400).
When selecting a catalog encoder, this parameter cannot be changed (write protection). Information in p0400 should be carefully observed when removing write protection.

**Notice:**
If an SSI encoder (bit 9 = 1) is used as motor encoder for permanent-magnet synchronous motors, then this is only permissible in conjunction with an additional A/B track (bit 3 = 1 or bit 4 = 1).

**Note:**
ZM: Zero mark
SMC: Sensor Module Cabinet
If a technique to determine the commutation information/data has not been selected (e.g. track C/D, Hall sensor), and the encoder pulse number is an integer multiple of the pole number, then the following applies:
The track A/B is adjusted to match the magnetic position of the motor.
Parameter

List of parameters

Re bit 01, 02 (absolute encoder, multiturn encoder):
These bits can only be selected for EnDat encoders, SSI encoders or DRIVE-CLiQ encoders.
Re bit 10 (DRIVE-CLiQ encoder):
This bit is only used for the large-scale integrated DRIVE-CLiQ encoders that provide their encoder data directly in
DRIVE-CLiQ format without converting this data. This bit is not, therefore, set for first-generation DRIVE-CLiQ
encoders.
Re bit 12 (equidistant zero mark):
The zero marks occur at regular intervals (e.g. rotary encoder with 1 zero mark per revolution or linear encoder with
constant zero mark distance).
The bit activates monitoring of the zero mark distance (p0424/p0425, linear/rotary) or in the case of the linear
encoder with 1 zero mark and p0424 = 0 zero mark monitoring is activated.
Re bit 13 (irregular zero mark):
The zero marks occur at irregular intervals (e.g. a linear scale with only 1 zero mark in the traversing range). The
zero mark distance is not monitored.
Re bit 14 (distance-coded zero mark):
The distance (clearance) between two or several consecutive zero marks allows the absolute position to be calcu-
lated.
Re bit 15 (commutation with zero mark):
Only applicable for synchronous motors.
The function can be de-selected by priority via p0430.23.
For distance-coded zero marks, the following applies:
The phase sequence of the C/D track (if available) must be the same as the phase sequence of the encoder (A/B
track).
The phase sequence of the Hall signal (if available) must be the same as the phase sequence of the motor. Further,
the position of the Hall sensor must be mechanically adjusted to the motor EMF.
The fine synchronization is only started after two zero marks have been passed.

<table>
<thead>
<tr>
<th>p0405[0...n]</th>
<th>Square-wave encoder track A/B / Sq-wave enc A/B</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Can be changed: C2(4) Calculated: - Access level: 3</td>
</tr>
<tr>
<td>Data type: Unsigned32 Dynamic index: EDS, p0140 Func. diagram: 4704</td>
<td></td>
</tr>
<tr>
<td>P-Group: Encoder Units group: - Unit selection: -</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: - Scaling: - Expert list: 1</td>
<td></td>
</tr>
<tr>
<td>Min Max Factory setting</td>
<td></td>
</tr>
<tr>
<td>- - 0000 1111 bin</td>
<td></td>
</tr>
</tbody>
</table>

Description:
Settings for the track A/B in a square-wave encoder.
For square-wave encoders, p0404.3 must also be 1.

Bit field:

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Signal</td>
<td>Bipolar</td>
<td>Unipolar</td>
<td>-</td>
</tr>
<tr>
<td>01</td>
<td>Level</td>
<td>TTL</td>
<td>HTL</td>
<td>-</td>
</tr>
<tr>
<td>02</td>
<td>Track monitoring</td>
<td>A/B &lt;&gt; -A/B</td>
<td>None</td>
<td>-</td>
</tr>
<tr>
<td>03</td>
<td>Zero pulse</td>
<td>Same as A/B track</td>
<td>24 V unipolar</td>
<td>-</td>
</tr>
<tr>
<td>04</td>
<td>Switching thresh</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>05</td>
<td>Pulse/direction</td>
<td>Active</td>
<td>Inactive</td>
<td>-</td>
</tr>
</tbody>
</table>

Caution:
This parameter is automatically pre-set for encoders from the encoder list (p0400). When selecting a catalog
encoder, this parameter cannot be changed (write protection). Information in p0400 should be carefully observed
when removing write protection.

Note:
Re bit 02:
When the function is activated, track monitoring can be de-activated by setting p0437.26.
Re bit 05:
When the function is activated, a frequency setpoint and a direction for traveling can be entered via an encoder
interface.
**List of parameters**

### p0408[0...n] Rotary encoder pulse No. / Rot enc pulse No.

- **SERVO_S110-CAN**, **SERVO_S110-DP**, **SERVO_S110-PN**
- **Can be changed:** C2(4)
- **Data type:** Unsigned32
- **P-Group:** Encoder
- **Not for motor type:** -
- **Min:** 0
- **Max:** 16777215
- **Factory setting:** 2048

**Description:**
Sets the number of pulses for a rotary encoder.

**Caution:**
This parameter is automatically pre-set for encoders from the encoder list (p0400). When selecting a catalog encoder, this parameter cannot be changed (write protection). Information in p0400 should be carefully observed when removing write protection.

**Note:**
The number of pole pairs for a resolver is entered here. The smallest permissible value is 1 pulse.

### p0410[0...n] Encoder inversion actual value / Enc inv act value

- **SERVO_S110-CAN**, **SERVO_S110-DP**, **SERVO_S110-PN**
- **Can be changed:** C2(4)
- **Data type:** Unsigned16
- **P-Group:** Encoder
- **Min:** -
- **Max:** -
- **Factory setting:** 0000 bin

**Description:**
Setting to invert actual values.

**Bit field:**
- **Bit 00:** Invert speed actual value
  - **Signal name:** Yes
  - **0 signal:** No
  - **FP:** 4710, 4715
- **Bit 01:** Invert position actual value
  - **Signal name:** Yes
  - **0 signal:** No
  - **FP:** 4704

**Note:**
The inversion influences the following parameters:
- Bit 00: r0061, r0063 (exception: encoderless control), r0094
- Bit 01: r0482, r0483

### p0414[0...n] Redundant coarse position value relevant bits (identified) / Relevant bits

- **SERVO_S110-CAN**, **SERVO_S110-DP**, **SERVO_S110-PN**
- **Can be changed:** C2(4)
- **Data type:** Unsigned16
- **P-Group:** Encoder
- **Min:** 0
- **Max:** 16
- **Factory setting:** 16

**Description:**
Sets the number of relevant bits for the redundant coarse position value.

### p0415[0...n] Gx_XIST1 Coarse position safe most significant bit (identified) / Gx_XIST1 safe MSB

- **SERVO_S110-CAN**, **SERVO_S110-DP**, **SERVO_S110-PN**
- **Can be changed:** C2(4)
- **Data type:** Unsigned16
- **P-Group:** Encoder
- **Min:** 0
- **Max:** 31
- **Factory setting:** 14

**Description:**
Sets the bit number for the safe most significant bit (MSB) of the Gx_XIST1 coarse position.

**Note:**
MSB: Most Significant Bit
### Parameter List of parameters

#### p0418[0...n]  Fine resolution Gx_XIST1 (in bits) / Enc fine Gx_XIST1

**Description:** Sets the fine resolution in bits of the incremental position actual values.

**Note:** The parameter applies for the following process data:
- Gx_XIST1
- Gx_XIST2 for reference mark or flying measurement

The fine resolution specifies the fraction between two encoder pulses. Depending on the physical measurement principle, an encoder pulse can be broken down into a different number of fractions (e.g. squarewave encoder: 2 bit = resolution 4, sin/cos encoder: Typical 11 bit = resolution 2048).

For a squarewave encoder, with the factory setting, the least significant bits have the value zero, i.e. they do not supply any useful information.

For especially high quality measuring systems, the fine resolution must be increased corresponding to the available accuracy.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Access level</th>
<th>Func. diagram</th>
<th>Unit selection</th>
</tr>
</thead>
<tbody>
<tr>
<td>p0418[0...n]</td>
<td>2</td>
<td>3</td>
<td>4010, 4704</td>
<td></td>
</tr>
</tbody>
</table>

#### p0419[0...n]  Fine resolution absolute value Gx_XIST2 (in bits) / Enc fine Gx_XIST2

**Description:** Sets the fine resolution in bits of the absolute position actual values.

**Dependency:** Refer to: p0418

**Note:** This parameter applies to process data Gx_XIST2 when reading the absolute value.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Access level</th>
<th>Func. diagram</th>
<th>Unit selection</th>
</tr>
</thead>
<tbody>
<tr>
<td>p0419[0...n]</td>
<td>2</td>
<td>3</td>
<td>4704, 4710</td>
<td></td>
</tr>
</tbody>
</table>

#### p0421[0...n]  Absolute encoder rotary multiturn resolution / Enc abs multiturn

**Description:** Sets the number of rotations that can be resolved for a rotary absolute encoder.

**Caution:** This parameter is automatically pre-set for encoders from the encoder list (p0400). When selecting a catalog encoder, this parameter cannot be changed (write protection). Information in p0400 should be carefully observed when removing write protection.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Access level</th>
<th>Func. diagram</th>
<th>Unit selection</th>
</tr>
</thead>
<tbody>
<tr>
<td>p0421[0...n]</td>
<td>65535</td>
<td>3</td>
<td>4704</td>
<td></td>
</tr>
</tbody>
</table>

#### p0423[0...n]  Absolute encoder rotary singleturn resolution / Enc abs singleturn

**Description:** Sets the number of measuring steps per revolution for a rotary absolute encoder. The resolution refers to the absolute position.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Access level</th>
<th>Func. diagram</th>
<th>Unit selection</th>
</tr>
</thead>
<tbody>
<tr>
<td>p0423[0...n]</td>
<td>1073741823</td>
<td>3</td>
<td>4704</td>
<td></td>
</tr>
</tbody>
</table>
### Caution:
This parameter is automatically pre-set for encoders from the encoder list (p0400). When selecting a catalog encoder, this parameter cannot be changed (write protection). Information in p0400 should be carefully observed when removing write protection.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Encoder, rotary zero mark distance / Enc rot dist ZM</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</strong></td>
<td><strong>Access level: 3</strong></td>
</tr>
<tr>
<td><strong>Can be changed: C2(4)</strong></td>
<td><strong>Calculated: -</strong></td>
</tr>
<tr>
<td><strong>Data type: Unsigned32</strong></td>
<td><strong>Dynamic index: EDS, p0140</strong></td>
</tr>
<tr>
<td><strong>P-Group:</strong></td>
<td><strong>Units group:</strong></td>
</tr>
<tr>
<td><strong>Enc</strong></td>
<td><strong>-</strong></td>
</tr>
<tr>
<td><strong>Not for motor type:</strong></td>
<td><strong>Scalings:</strong></td>
</tr>
<tr>
<td><strong>Min</strong></td>
<td><strong>Max</strong></td>
</tr>
<tr>
<td><strong>0</strong></td>
<td><strong>16777215</strong></td>
</tr>
<tr>
<td></td>
<td><strong>2048</strong></td>
</tr>
<tr>
<td><strong>Description:</strong></td>
<td>Sets the distance in pulses between two zero marks for a rotary encoder. This information is used for zero mark monitoring.</td>
</tr>
<tr>
<td><strong>Caution:</strong></td>
<td>This parameter is automatically pre-set for encoders from the encoder list (p0400). When selecting a catalog encoder, this parameter cannot be changed (write protection). Information in p0400 should be carefully observed when removing write protection.</td>
</tr>
<tr>
<td><strong>Note:</strong></td>
<td>For distance-coded zero marks, this means the basic distance.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Encoder zero mark differential distance / Enc ZM Dif_dist</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</strong></td>
<td><strong>Access level: 3</strong></td>
</tr>
<tr>
<td><strong>Can be changed: C2(4)</strong></td>
<td><strong>Calculated: -</strong></td>
</tr>
<tr>
<td><strong>Data type: Unsigned16</strong></td>
<td><strong>Dynamic index: EDS, p0140</strong></td>
</tr>
<tr>
<td><strong>P-Group:</strong></td>
<td><strong>Units group:</strong></td>
</tr>
<tr>
<td><strong>Enc</strong></td>
<td><strong>-</strong></td>
</tr>
<tr>
<td><strong>Not for motor type:</strong></td>
<td><strong>Scalings:</strong></td>
</tr>
<tr>
<td><strong>Min</strong></td>
<td><strong>Max</strong></td>
</tr>
<tr>
<td><strong>1</strong></td>
<td><strong>65535</strong></td>
</tr>
<tr>
<td><strong>Description:</strong></td>
<td>Sets the differential distance with distance-coded zero marks [signal periods]. The value corresponds to jump displacement of &quot;zero mark with interference&quot;.</td>
</tr>
<tr>
<td><strong>Caution:</strong></td>
<td>This parameter is automatically pre-set for encoders from the encoder list (p0400). When selecting a catalog encoder, this parameter cannot be changed (write protection). Information in p0400 should be carefully observed when removing write protection.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Encoder SSI baud rate / Enc SSI baud rate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</strong></td>
<td><strong>Access level: 3</strong></td>
</tr>
<tr>
<td><strong>Can be changed: C2(4)</strong></td>
<td><strong>Calculated: -</strong></td>
</tr>
<tr>
<td><strong>Data type: FloatingPoint32</strong></td>
<td><strong>Dynamic index: EDS, p0140</strong></td>
</tr>
<tr>
<td><strong>P-Group:</strong></td>
<td><strong>Units group:</strong></td>
</tr>
<tr>
<td><strong>Enc</strong></td>
<td><strong>-</strong></td>
</tr>
<tr>
<td><strong>Not for motor type:</strong></td>
<td><strong>Scalings:</strong></td>
</tr>
<tr>
<td><strong>Min</strong></td>
<td><strong>Max</strong></td>
</tr>
<tr>
<td><strong>0 [kHz]</strong></td>
<td><strong>65535 [kHz]</strong></td>
</tr>
<tr>
<td><strong>Description:</strong></td>
<td>Sets the baud rate for an SSI encoder.</td>
</tr>
<tr>
<td><strong>Caution:</strong></td>
<td>This parameter is automatically pre-set for encoders from the encoder list (p0400). When selecting a catalog encoder, this parameter cannot be changed (write protection). Information in p0400 should be carefully observed when removing write protection.</td>
</tr>
<tr>
<td><strong>Note:</strong></td>
<td>SSI: Synchronous Serial Interface</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Encoder SSI monoflop time / Enc SSI t_monoflop</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</strong></td>
<td><strong>Access level: 3</strong></td>
</tr>
<tr>
<td><strong>Can be changed: C2(4)</strong></td>
<td><strong>Calculated: -</strong></td>
</tr>
<tr>
<td><strong>Data type: Unsigned16</strong></td>
<td><strong>Dynamic index: EDS, p0140</strong></td>
</tr>
<tr>
<td><strong>P-Group:</strong></td>
<td><strong>Units group:</strong></td>
</tr>
<tr>
<td><strong>Enc</strong></td>
<td><strong>-</strong></td>
</tr>
<tr>
<td><strong>Not for motor type:</strong></td>
<td><strong>Scalings:</strong></td>
</tr>
<tr>
<td><strong>Min</strong></td>
<td><strong>Max</strong></td>
</tr>
<tr>
<td><strong>0 [µs]</strong></td>
<td><strong>65535 [µs]</strong></td>
</tr>
<tr>
<td><strong>Description:</strong></td>
<td>Sets the minimum delay time between two data transfers of the absolute value for an SSI encoder.</td>
</tr>
</tbody>
</table>
### Caution:
This parameter is automatically pre-set for encoders from the encoder list (p0400). When selecting a catalog encoder, this parameter cannot be changed (write protection). Information in p0400 should be carefully observed when removing write protection.

### p0429[0...n] Encoder SSI configuration / Enc SSI config

- **SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**
- **Can be changed:** C2(4)
- **Data type:** Unsigned16
- **P-Group:** Encoder
- **Not for motor type:** -
- **Min:** -
- **Max:** -
- **Factory setting:** 0000 0000 bin

**Description:**
Sets the configuration for an SSI encoder.

**Bit field:**

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Transfer code</td>
<td>Binary code</td>
<td>Gray code</td>
<td>-</td>
</tr>
<tr>
<td>02</td>
<td>Transfer absolute value twice</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>06</td>
<td>Data line during the monoflop time</td>
<td>High level</td>
<td>Low level</td>
<td>-</td>
</tr>
</tbody>
</table>

**Caution:**
This parameter is automatically pre-set for encoders from the encoder list (p0400). When selecting a catalog encoder, this parameter cannot be changed (write protection). Information in p0400 should be carefully observed when removing write protection.

**Note:**
Re bit 06:
The quiescent signal level of the data line corresponds to the inverted, set level.

### p0430[0...n] Sensor Module configuration / SM config

- **SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**
- **Can be changed:** C2(4)
- **Data type:** Unsigned32
- **P-Group:** Encoder
- **Not for motor type:** -
- **Min:** -
- **Max:** -
- **Factory setting:** 1110 0000 0000 1000 0000 0000 0000 bin

**Description:**
Sets the configuration of the Sensor Module.

**Bit field:**

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
<td>Burst oversampling</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>18</td>
<td>Continuous oversampling (reserved)</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>19</td>
<td>Safety position actual value sensing</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>20</td>
<td>Speed calculation mode (only SMC30)</td>
<td>Incremental diff</td>
<td>Flank time meas</td>
<td>-</td>
</tr>
<tr>
<td>21</td>
<td>Zero mark tolerance</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>22</td>
<td>Rot pos adapt</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>23</td>
<td>De-select commutation with zero mark</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>24</td>
<td>Commutation with selected zero mark</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>25</td>
<td>Switch off encoder voltage supply during parking</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>27</td>
<td>Extrapolate position values</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>28</td>
<td>Cubic correction</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>29</td>
<td>Phase correction</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>30</td>
<td>Amplitude correction</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>31</td>
<td>Offset correction</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
</tbody>
</table>

**Notice:**
A bit-wise configuration is only possible if the corresponding property is also present in r0458.

**Note:**
Re bit 17 (burst oversampling):
- if bit = 1, burst oversampling is switched on.
Re bit 18 (continuous oversampling):
- if bit = 1, continuous oversampling is switched on.
Re bit 19 (Safety position actual value sensing):
- if bit = 1, the Safety position actual value is transferred in the cyclic telegram.
Re bit 20 (speed calculation mode):
- if bit = 1, the speed is calculated via incremental difference without extrapolation.
- if bit = 0, the speed is calculated via edge time measurement with extrapolation. p0453 is effective in this mode.

Re bit 21 (zero mark tolerance):
- if bit = 1, a one-off zero mark distance error is tolerated. In the event of a defect, the fault F3x100/F3x101 does not appear, but alarm A3x400/A3x401 does.

Re bit 22 (rotor position adaptation):
- if bit = 1, the rotor position is corrected automatically. The correction speed is +/-1/4 encoder pulse per zero mark distance.

Re bit 23 (de-select commutation with zero mark):
- The bit should only be set for encoders that have not been adjusted.

Re bit 24 (commutation with selected zero mark):
- if bit = 1, the commutation position is corrected via a selected zero mark.

Re bit 25 (disconnect the encoder power supply on parking):
- if bit = 1, the encoder power supply is switched off on parking (0 V).
- if bit = 0, the encoder power supply is not switched off on parking, it is reduced from 24 V to 5 V.

Re bit 27 (extrapolate position values):
- if bit = 1, the extrapolation of the position values is activated.

Re bit 28 (cubic correction):
- if bit = 1, the cubic correction for track A/B sine is activated.

Re bit 29 (phase correction):
- if bit = 1, the phase correction for track A/B sine is activated.

Re bit 30 (amplitude correction):
- if bit = 1, the amplitude correction for track A/B sine is activated.

Re bit 31 (offset correction):
- if bit = 1, the offset correction for track A/B sine is activated.

---

<table>
<thead>
<tr>
<th>p0431[0...n]</th>
<th>Angular commutation offset / Ang_com offset</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td><strong>Can be changed:</strong> C2(4) <strong>Calculated:</strong> - <strong>Access level:</strong> 3</td>
</tr>
<tr>
<td><strong>Data type:</strong> FloatingPoint32</td>
<td><strong>Dynamic index:</strong> EDS, p0140 <strong>Func. diagram:</strong> -</td>
</tr>
<tr>
<td><strong>P-Group:</strong> Encoder</td>
<td><strong>Units group:</strong> - <strong>Unit selection:</strong> -</td>
</tr>
<tr>
<td><strong>Not for motor type:</strong> -</td>
<td><strong>Scaling:</strong> - <strong>Expert list:</strong> 1</td>
</tr>
<tr>
<td><strong>Min</strong></td>
<td><strong>Max</strong></td>
</tr>
<tr>
<td>-180.00 [°]</td>
<td>180.00 [°]</td>
</tr>
</tbody>
</table>

**Description:** Sets the angular commutation offset.

**Dependency:** The value is taken into account in r0094.

**Refer to:** r0094, r1778

**Caution:** When the firmware is upgraded from V2.3 to V2.4 or higher, the value must be reduced by 60° if all the following conditions are fulfilled:
- The motor is a synchronous motor (p0300 = 2, 2xx, 4, 4xx).
- The encoder is a resolver (p0404.23 = 1).
- The actual speed value is inverted (p0410.0 = 1).

**Notice:** The angular commutation offset cannot be generally taken from other drive systems. As a minimum - the sign of the offset determined for SIMODRIVE 611 digital and SIMODRIVE 611 universal must be reversed for SINAMICS (p0431 (SINAMICS) = -p1016 (SIMODRIVE)).

**Note:** Angular commutation offset, angular difference between electrical position of encoder and flux position.

For p0404.5 = 1 (track C/D) the following applies:
The angular offset in p0431 acts on track A/B, the zero mark on track C/D.
For p0404.6 = 1 (Hall sensor) the following applies:
The angular offset in p0431 acts on track A/B and the zero mark.
Parameter

List of parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>p0432[0...n]</strong> Gearbox factor, encoder revolutions / Grbx_fact_enc_rev</td>
<td>Sets the encoder revolutions for the gearbox factor of the encoder evaluation. The gearbox factor specifies the ratio between the encoder shaft and motor shaft (for motor encoders) or between the encoder shaft and the load.</td>
<td>This parameter can only be set for p0402 = 9999. Refer to: p0410, p0433</td>
<td>Negative gearbox factors should be implemented with p0410.</td>
</tr>
<tr>
<td><strong>p0433[0...n]</strong> Gearbox factor, motor/load revolutions / Grbx_fact_mot_rev</td>
<td>Sets the motor and load revolutions for the gearbox factor of the encoder evaluation. The gearbox factor specifies the ratio between the encoder shaft and motor shaft (for motor encoders) or between the encoder shaft and the load.</td>
<td>This parameter can only be set for p0402 = 9999. Refer to: p0410, p0432</td>
<td>Negative gearbox factors should be implemented with p0410.</td>
</tr>
<tr>
<td><strong>p0434[0...n]</strong> Encoder SSI error bit / Enc SSI error bit</td>
<td>Sets the position and level of the error bit in the SSI protocol.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Example:**
p0434 = 1013
--> The evaluation is switched in and the error bit is at position 13 with a low level.
p0434 = 1113
--> The evaluation is switched in and the error bit is at position 13 with a high level.
**List of parameters**

### p0435[0...n] Encoder SSI alarm bit / Enc SSI alarm bit

| SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN |
| Can be changed: C2(4) |
| Data type: Unsigned16 |
| P-Group: Encoder |
| Min | Max |
| 0 | 65535 |

**Description:** Sets the position and level of the alarm bit in the SSI protocol.

**Notice:** The bit may only be positioned before (p0446) or after (p0448) the absolute value in the SSI protocol.

**Note:**
- Value = dcba
  - ba: Position of the alarm bit in protocol (0 ... 63).
  - c: Level (0: Low level, 1: High level).
  - d: State of the evaluation (0: Off, 1: On).

**Example:**
- `p0435 = 1014`
  --> The evaluation is switched in and the alarm bit is at position 14 with a low level.
- `p0435 = 1114`
  --> The evaluation is switched in and the alarm bit is at position 14 with a high level.

### p0436[0...n] Encoder SSI parity bit / Enc SSI parity bit

| SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN |
| Can be changed: C2(4) |
| Data type: Unsigned16 |
| P-Group: Encoder |
| Min | Max |
| 0 | 65535 |

**Description:** Sets the position and parity of the parity bit in the SSI protocol.

**Notice:** The bit may only be positioned before (p0446) or after (p0448) the absolute value in the SSI protocol.

**Note:**
- Value = dcba
  - ba: Position of the parity bit in the protocol (0 ... 63).
  - c: Parity (0: even, 1: uneven).
  - d: State of the evaluation (0: Off, 1: On).

**Example:**
- `p0436 = 1015`
  --> The evaluation is switched in and the parity bit is at position 15 with even parity.
- `p0436 = 1115`
  --> The evaluation is switched in and the parity bit is at position 15 with uneven parity.

### p0437[0...n] Sensor Module configuration extended / SM config ext

<p>| SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN |
| Can be changed: C2(4) |
| Data type: Unsigned32 |
| P-Group: Encoder |</p>
<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
</table>

**Description:** Sets the extended configuration of the Sensor Module.

**Bit field:**

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Data logger</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>01</td>
<td>Zero mark edge detection</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>02</td>
<td>Correction position actual value XIST1</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>04</td>
<td>Edge evaluation bit 0</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
</tbody>
</table>
Parameter

List of parameters

05  Edge evaluation bit 1  Yes  No  -
06  Freeze the speed actual value for dn/dt errors  Yes  No  -
07  Accumulate uncorrected encoder pulses  Yes  No  -
11  Fault handling after PROFIdrive  Yes  No  -
12  Activate additional messages  Yes  No  -
26  Track monitoring de-selection  Yes  No  -
28  EnDat linear encoder monitoring incremental/absolute  Yes  No  -
29  EnDat encoder initialization with high accuracy  Yes  No  -
31  Analog unipolar track monitoring  Yes  No  -

Dependency: Refer to: p0430, r0459

Note:
A value of zero is displayed if an encoder is not present.

Re bit 00:
When the data logger (trace) is activated, in the case of a fault, data before and after the event are recorded (traced) and saved in files on the non-volatile memory medium. Experts can then evaluate this data.

Re bit 01:
If bit = 0, the zero mark is evaluated by ANDing tracks A and B and the zero mark.
For bit = 1, the zero mark is evaluated depending on the direction of rotation detected. For a positive direction of rotation, the positive edge of the zero mark is considered and for a negative direction of rotation, the negative edge of the zero mark.

Re bit 02:
If the bit is set, in the event of a deviation less than the tolerance window for the zero mark (p4681, p4682), the pulses per revolution are corrected. If the bit is not set, encoder fault F3x131 is triggered.

Re Bit 04 and Bit 05:
The current hardware only supports 1x or 4x signal evaluation.
Bit 5/4 = 0/0: Signal evaluation per period, 4x.
Bit 5/4 = 1/0: Illegal setting.
Bit 5/4 = 0/1: Signal evaluation per period, 1x.
Bit 5/4 = 1/1: Illegal setting.

Re bit 06:
If the function is active, when dn/dt monitoring responds, the speed actual value is internally frozen for a time equivalent to two current controller clock cycles. The rotor position continues to be integrated. The actual value is then re-enabled after this time has expired.

Re bit 07:
If the bit is set, the encoder pulses which have not been corrected are added to p4688 at the zero mark.

Re bit 11:
If the bit is set, the Sensor Module checks within a certain time grid whether the fault cause is still present. This enables the Sensor Module to switch from the fault state to the operating state and provide valid actual values automatically. The faults are displayed until the user acknowledges them.

Re bit 12:
Additional fault messages can be activated for extended fault diagnostics.

Re bit 20:
If the bit is set, the bandwidth of the analog filter for SMx10 (resolver) and SMx20 (sin/cos encoder) can be set via p4660.

Re bit 26:
Track monitoring is de-activated for the square-wave encoders when the bit is set, even if the monitoring function is selected in p0405.2.

Re bit 28:
Monitoring of the difference between incremental and absolute position in the case of linear encoders.

Re bit 29:
When the bit is set, the EnDat encoder is initialized under a certain speed and, therefore, with high accuracy. If initialization at a higher speed is requested, fault F31151, F32151, or F33151 is output.

Re bit 31:
When monitoring is active, the levels of the individual track signals and the corresponding inverted track signals are monitored separately.
### p0438[0...n] Squarewave encoder filter time / Enc t_filt

<table>
<thead>
<tr>
<th>Service Group(s)</th>
<th>Data type</th>
<th>P-Group</th>
<th>Units group</th>
<th>Not for motor type</th>
<th>Units</th>
<th>Scaling</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>FloatingPoint32</td>
<td>Encoder</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.00 [µs]</td>
<td>100.00 [µs]</td>
<td>0.64 [µs]</td>
</tr>
</tbody>
</table>

**Description:** Sets the filter time for a squarewave encoder. The hardware of the squarewave encoder only supports the following values:

- 0: No filtering
- 0.04 µs
- 0.64 µs
- 2.56 µs
- 10.24 µs
- 20.48 µs

**Dependency:** Refer to: r0452

**Notice:** If the filter time is too long, the track signals A/B/R may be suppressed and the appropriate messages output.

**Note:** The most suitable filter time depends on the number of pulses and maximum speed of the square-wave encoder. The filter time is automatically corrected to the next value when entering a non-specified value. In this case, no message is output. The effective filter time is displayed in r0452.

### p0439[0...n] Encoder ramp-up time / Enc ramp-up time

<table>
<thead>
<tr>
<th>Service Group(s)</th>
<th>Data type</th>
<th>P-Group</th>
<th>Units group</th>
<th>Not for motor type</th>
<th>Units</th>
<th>Scaling</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Unsigned16</td>
<td>Encoder</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0 [ms]</td>
<td>65535 [ms]</td>
<td>0 [ms]</td>
</tr>
</tbody>
</table>

**Description:** Sets the ramp-up time for the encoder. The encoder supplies stable track signals once this time has elapsed.

**Caution:** This parameter is automatically pre-set for encoders from the encoder list (p0400). When selecting a catalog encoder, this parameter cannot be changed (write protection). Information in p0400 should be carefully observed when removing write protection.

### p0440[0...n] Copy encoder serial number / Copy enc ser_no

<table>
<thead>
<tr>
<th>Service Group(s)</th>
<th>Data type</th>
<th>P-Group</th>
<th>Units group</th>
<th>Not for motor type</th>
<th>Units</th>
<th>Scaling</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Integer16</td>
<td>Encoder</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

**Description:** Copies the actual serial number of the encoder belonging to this Encoder Data Set (EDS) to p0441 ... p0445.

**Example:**
For p0440[0] = 1, the serial number of the encoder belonging EDS0 is copied to p0441[0] ... p0445[0].

**Value:**

- 0: No action
- 1: Transfer serial number

**Dependency:** Refer to: p0441, p0442, p0443, p0444, p0445, r0460, r0461, r0462, r0463, r0464, p1990

**Note:** For encoders with serial number, encoder replacement is monitored in order to request angular commutation calibration (adjustment) for motor encoders and absolute calibration for direct measuring systems with absolute value data. The serial number, which from then onwards is used for monitoring purposes, can be transferred using p0440.
In the following cases, copying is automatically started in the following cases:
1.) When commissioning 1FT6, 1FK6, 1FK7 motors.
2.) When writing into p0431.
3.) For p1990 = 1.
p0440 is automatically set to 0 when the copying has been completed.

In order to permanently accept the copied values, it is necessary to save in a non-volatile fashion (p0977).

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p0441[0...n]</td>
<td>Encoder commissioning serial number part 1 / Enc comm ser_no 1</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>A value of zero is displayed if an encoder is not present.</td>
</tr>
<tr>
<td>p0442[0...n]</td>
<td>Encoder commissioning serial number part 2 / Enc comm ser_no 2</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td></td>
</tr>
<tr>
<td>p0443[0...n]</td>
<td>Encoder commissioning serial number part 3 / Enc comm ser_no 3</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td></td>
</tr>
<tr>
<td>p0444[0...n]</td>
<td>Encoder commissioning serial number part 4 / Enc comm ser_no 4</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td></td>
</tr>
</tbody>
</table>
### List of parameters

**Dependency:**
Refer to: p0440, p0441, p0442, p0443, p0445, r0460, r0461, r0462, r0463, r0464
Refer to: F07414

**Note:** A value of zero is displayed if an encoder is not present.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p0445[0...n]</td>
<td>Encoder commissioning serial number part 5 / Enc comm ser_no 5</td>
<td>Can be changed: C2(4)</td>
<td>A value of zero is displayed if an encoder is not present.</td>
</tr>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td></td>
<td>Calculated: CALC_MOD_ALL</td>
<td></td>
</tr>
<tr>
<td>Data type: Unsigned32</td>
<td>Dynamic index: EDS, p0140</td>
<td>Access level: 4</td>
<td></td>
</tr>
<tr>
<td>P-Group: Encoder</td>
<td>Units group: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min Max</td>
<td>Factory setting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0000 hex</td>
<td>FFFF FFFF hex 0000 hex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>p0446[0...n]</td>
<td>Encoder SSI number of bits before the absolute value / Enc SSI bit before</td>
<td>Can be changed: C2(4)</td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Calculated: -</td>
<td>Access level: 3</td>
<td></td>
</tr>
<tr>
<td>Data type: Unsigned16</td>
<td>Dynamic index: EDS, p0140</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P-Group: Encoder</td>
<td>Units group: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min Max</td>
<td>Factory setting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 65535</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>p0447[0...n]</td>
<td>Encoder SSI number of bits absolute value / Enc SSI bit val</td>
<td>Can be changed: C2(4)</td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Calculated: -</td>
<td>Access level: 3</td>
<td></td>
</tr>
<tr>
<td>Data type: Unsigned16</td>
<td>Dynamic index: EDS, p0140</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P-Group: Encoder</td>
<td>Units group: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min Max</td>
<td>Factory setting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 65535</td>
<td>25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>p0448[0...n]</td>
<td>Encoder SSI number of bits after the absolute value / Enc SSI bit after</td>
<td>Can be changed: C2(4)</td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Calculated: -</td>
<td>Access level: 3</td>
<td></td>
</tr>
<tr>
<td>Data type: Unsigned16</td>
<td>Dynamic index: EDS, p0140</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P-Group: Encoder</td>
<td>Units group: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min Max</td>
<td>Factory setting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 65535</td>
<td>0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### List of parameters

#### p0449[0...n] Encoder SSI number of bits, filler bits / Enc SSI fill bits

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Caution</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p0449[0...n]</td>
<td>Sets the number of filler bits for double absolute value transfer in the SSI protocol.</td>
<td>Refer to: p0429</td>
<td>This parameter is automatically pre-set for encoders from the encoder list (p0400). When selecting a catalog encoder, this parameter cannot be changed (write protection). Information in p0400 should be carefully observed when removing write protection.</td>
<td>This parameter is only of significance for p0429.2 = 1.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Can be changed: C2(4)</th>
<th>Calculated: -</th>
<th>Access level: 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN</td>
<td>Unsigned16</td>
<td>Dynamic index: EDS, p0140</td>
<td>Func. diagram: -</td>
</tr>
<tr>
<td>SERVO_S110-DP</td>
<td>Encoder</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>SERVO_S110-PN</td>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>65535</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

#### r0451[0...2] Commutation angle factor / Enc commut_factor

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Index</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>r0451[0...2]</td>
<td>Displays the relationship between the electrical and mechanical pole positions.</td>
<td>[0] = Encoder 1, [1] = Encoder 2, [2] = Reserved</td>
<td>A value of zero is displayed if an encoder is not present.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Can be changed: -</th>
<th>Calculated: -</th>
<th>Access level: 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN</td>
<td>Unsigned16</td>
<td>Dynamic index:</td>
<td>Func. diagram: 4710</td>
</tr>
<tr>
<td>SERVO_S110-DP</td>
<td>Encoder</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>SERVO_S110-PN</td>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

#### r0452[0...2] Squarewave encoder filter time display / Enc t_filt displ

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Index</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>r0452[0...2]</td>
<td>Displays the effective filter time for a squarewave encoder. The filter time is set using p0438.</td>
<td>[0] = Encoder 1, [1] = Encoder 2, [2] = Reserved</td>
<td>Refer to: p0438</td>
<td>A value of zero is displayed if an encoder is not present.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Can be changed: C2(4)</th>
<th>Calculated: -</th>
<th>Access level: 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN</td>
<td>FloatingPoint32</td>
<td>Dynamic index:</td>
<td>Func. diagram: -</td>
</tr>
<tr>
<td>SERVO_S110-DP</td>
<td>Encoder</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>SERVO_S110-PN</td>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>- [µs]</td>
<td>- [µs]</td>
<td>- [µs]</td>
<td></td>
</tr>
</tbody>
</table>

#### p0453[0...n] Pulse encoder evaluation zero speed measuring time / Enc_ev z 0 t_meas

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p0453[0...n]</td>
<td>Sets the measuring time for evaluating zero speed. If no pulses are detected from track A/B during this time, a speed actual value of zero is output.</td>
<td>Refer to: r0452</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Can be changed: C2(4)</th>
<th>Calculated: -</th>
<th>Access level: 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN</td>
<td>FloatingPoint32</td>
<td>Dynamic index: EDS, p0140</td>
<td>Func. diagram: -</td>
</tr>
<tr>
<td>SERVO_S110-DP</td>
<td>Encoder</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>SERVO_S110-PN</td>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.10 [ms]</td>
<td>10000.00 [ms]</td>
<td>1000.00 [ms]</td>
<td></td>
</tr>
</tbody>
</table>
Note: This function is required for slow-running motors so that actual speeds close to zero can be output correctly.

**r0455[0...2]**  Encoder configuration recognized / Enc config act

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
<th>Can be changed: -</th>
<th>Calculated: -</th>
<th>Access level: 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type: Unsigned32</td>
<td>Dynamic index: -</td>
<td>Func. diagram: -</td>
<td></td>
</tr>
<tr>
<td>P-Group: Encoder</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
</tr>
</tbody>
</table>

**Index:**

- [0] = Encoder 1
- [1] = Encoder 2
- [2] = Reserved

**Description:** Displays the detected encoder configuration.

In this case, the encoder must automatically support the function (e.g. encoder with EnDat interface).

**Dependency:** Refer to: p0404

**Note:**

- ZM: Zero mark
  - This parameter is only used for diagnostics.
  - A value of zero is displayed if an encoder is not present.
  - Re bit 20, 21 (voltage level 5 V, voltage level 24 V):
    - The voltage level cannot be detected. Therefore, these bits are always set to 0.

**r0456[0...2]**  Encoder configuration supported / Enc config supp

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
<th>Can be changed: -</th>
<th>Calculated: -</th>
<th>Access level: 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type: Unsigned32</td>
<td>Dynamic index: -</td>
<td>Func. diagram: -</td>
<td></td>
</tr>
<tr>
<td>P-Group: Encoder</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Contains the encoder configuration supported by the Sensor Module.

**Index:**

- [0] = Encoder 1
- [1] = Encoder 2
- [2] = Reserved

**Dependency:**

**Note:**

- This parameter is only used for diagnostics.
  - A value of zero is displayed if an encoder is not present.
  - Re bit 20, 21 (voltage level 5 V, voltage level 24 V):
    - The voltage level cannot be detected. Therefore, these bits are always set to 0.
Parameter

List of parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Index</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>02</td>
<td>Multiturn encoder</td>
<td>[0...2]</td>
<td>-</td>
</tr>
<tr>
<td>03</td>
<td>Track A/B sq-wave</td>
<td>[0...2]</td>
<td>-</td>
</tr>
<tr>
<td>04</td>
<td>Track A/B sinus</td>
<td>[0...2]</td>
<td>-</td>
</tr>
<tr>
<td>05</td>
<td>Track C/D</td>
<td>[0...2]</td>
<td>-</td>
</tr>
<tr>
<td>06</td>
<td>Hall sensor</td>
<td>[0...2]</td>
<td>-</td>
</tr>
<tr>
<td>08</td>
<td>EnDat encoder</td>
<td>[0...2]</td>
<td>-</td>
</tr>
<tr>
<td>09</td>
<td>SSI encoder</td>
<td>[0...2]</td>
<td>-</td>
</tr>
<tr>
<td>10</td>
<td>DRIVE-CLiQ encoder</td>
<td>[0...2]</td>
<td>-</td>
</tr>
<tr>
<td>11</td>
<td>Digital encoder</td>
<td>[0...2]</td>
<td>-</td>
</tr>
<tr>
<td>12</td>
<td>Equidistant zero mark</td>
<td>[0...2]</td>
<td>-</td>
</tr>
<tr>
<td>13</td>
<td>Irregular zero mark</td>
<td>[0...2]</td>
<td>-</td>
</tr>
<tr>
<td>14</td>
<td>Distance-coded zero mark</td>
<td>[0...2]</td>
<td>-</td>
</tr>
<tr>
<td>15</td>
<td>Commutation with zero mark (not ASM)</td>
<td>[0...2]</td>
<td>-</td>
</tr>
<tr>
<td>16</td>
<td>Acceleration</td>
<td>[0...2]</td>
<td>-</td>
</tr>
<tr>
<td>17</td>
<td>Track A/B analog</td>
<td>[0...2]</td>
<td>-</td>
</tr>
<tr>
<td>20</td>
<td>Voltage level 5 V</td>
<td>[0...2]</td>
<td>-</td>
</tr>
<tr>
<td>21</td>
<td>Voltage level 24 V</td>
<td>[0...2]</td>
<td>-</td>
</tr>
<tr>
<td>22</td>
<td>Remote sense (only SMC30)</td>
<td>[0...2]</td>
<td>-</td>
</tr>
<tr>
<td>23</td>
<td>Resolver excit.</td>
<td>[0...2]</td>
<td>-</td>
</tr>
</tbody>
</table>

Dependency:
Refer to: p0404

Note:
ZM: Zero mark
This parameter is only used for diagnostics.
A value of zero is displayed if an encoder is not present.

<table>
<thead>
<tr>
<th>Bit field</th>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Encoder data available</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>01</td>
<td>Motor data available</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>02</td>
<td>Temperature sensor connection available</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>03</td>
<td>Connection for PTC for motor with DRIVE-CLiQ also available</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>04</td>
<td>Module temperature available</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>05</td>
<td>Absolute encoder p0408/p0421, no power of 2</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>06</td>
<td>Sensor Module permits parking/unparking</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>07</td>
<td>Hall sensor can be combined with actual value inversion</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>08</td>
<td>Evaluation through several temperature channels possible</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>09</td>
<td>Encoder fault and its associated information available</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Speed diagnostics in the Sensor Module</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Configuring without park state possible</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Extended functions available</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Extended encoder fault handling</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Extended singleturn/multiturn information available</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Valuation figures available</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Pole position identification</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Burst oversampling</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>
### List of parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>1-113 © Siemens AG 2012 All Rights Reserved</th>
<th>SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependency:</td>
<td>Refer to: p0437, p0600, p0601</td>
<td></td>
</tr>
<tr>
<td>Note:</td>
<td>A value of zero is displayed if an encoder is not present.</td>
<td></td>
</tr>
<tr>
<td>Re bit 11:</td>
<td>When the property is set, the following parameters can be changed without the actual value in the encoder interface becoming invalid (state r0481.14 = 1 &quot;parking encoder active&quot;):</td>
<td></td>
</tr>
<tr>
<td>Re bit 12:</td>
<td>The extended functions can be configured using p0437.</td>
<td></td>
</tr>
<tr>
<td>Re bit 13:</td>
<td>Encoder faults can be acknowledged via Gn_STW.15.</td>
<td></td>
</tr>
<tr>
<td>Re bit 14:</td>
<td>Only for internal Siemens use.</td>
<td></td>
</tr>
<tr>
<td>Re bit 23:</td>
<td>When the property is set, commutation with zero mark can be de-selected using p0430.23.</td>
<td></td>
</tr>
<tr>
<td>Re bit 24:</td>
<td>If the property is set, commutation to the selected zero mark can be carried out.</td>
<td></td>
</tr>
</tbody>
</table>

#### r0459[0...2] Sensor Module properties extended / SM prop ext

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
<th>Can be changed: - Calculated: - Access level: 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type: Unsigned32</td>
<td>Dynamic index: - Func. diagram: -</td>
</tr>
<tr>
<td>P-Group: Encoder</td>
<td>Units group: - Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: - Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

#### Description:
Displays the extended properties supported by the Sensor Module.

#### Index:
- [0] = Encoder 1
- [1] = Encoder 2
- [2] = Reserved

#### Bit field:

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Data logger</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>01</td>
<td>Zero mark edge detection</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>02</td>
<td>Correction position actual value XIST1</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>04</td>
<td>Edge evaluation bit 0</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>05</td>
<td>Edge evaluation bit 1</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>06</td>
<td>Freeze the speed actual value for dn/dt errors</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>07</td>
<td>Accumulate uncorrected encoder pulses</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>09</td>
<td>Support function p0426, p0439</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>10</td>
<td>Pulse/direction interface</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>11</td>
<td>Fault handling after PROFIdrive</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>12</td>
<td>Activate additional messages</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
</tbody>
</table>
Parameter
List of parameters

14 Spindle functionality	Yes	No	-
25 Parameter check shift factor Gx_XIST2	Yes	No	-
26 Track monitoring de-selection	Yes	No	-
28 EnDat linear encoder monitoring incremental/absolute	Yes	No	-
29 EnDat encoder initialization with high accuracy	Yes	No	-
31 Analog unipolar track monitoring	Yes	No	-

Dependency:
Refer to: p0437

Note:
A value of zero is displayed if an encoder is not present.
Re bit 09:
Parameter p0426 or p0439 has been modified. These functions are not supported by the connected Sensor Module.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Index</th>
<th>Dependency</th>
</tr>
</thead>
<tbody>
<tr>
<td>r0460[0...2]</td>
<td>Encoder serial number part 1 / Enc ser_no 1</td>
<td></td>
<td>Refer to: p0441, p0442, p0443, p0444, p0445, r0461, r0462, r0463, r0464</td>
</tr>
<tr>
<td>r0461[0...2]</td>
<td>Encoder serial number part 2 / Enc ser_no 2</td>
<td></td>
<td>Refer to: p0441, p0442, p0443, p0444, p0445, r0460, r0462, r0463, r0464</td>
</tr>
<tr>
<td>r0462[0...2]</td>
<td>Encoder serial number part 3 / Enc ser_no 3</td>
<td></td>
<td>Refer to: p0441, p0442, p0443, p0444, p0445, r0460, r0461, r0463, r0464</td>
</tr>
<tr>
<td>Parameter</td>
<td>Description</td>
<td>Index</td>
<td>Dependency</td>
</tr>
<tr>
<td>-----------</td>
<td>-------------</td>
<td>-------</td>
<td>------------</td>
</tr>
<tr>
<td><strong>r0463[0...2]</strong></td>
<td>Encoder serial number part 4 / Enc ser_no 4</td>
<td>Displays the actual serial number part 4 of the appropriate encoder.</td>
<td>Refer to: p0441, p0442, p0443, p0444, p0445, r0460, r0461, r0462, r0464</td>
</tr>
<tr>
<td><strong>r0464[0...2]</strong></td>
<td>Encoder serial number part 5 / Enc ser_no 5</td>
<td>Displays the actual serial number part 5 of the appropriate encoder.</td>
<td>Refer to: p0441, p0442, p0443, p0444, p0445, r0460, r0461, r0462, r0463</td>
</tr>
<tr>
<td><strong>r0465[0...27]</strong></td>
<td>Encoder 1 identification number/serial number / Enc1 ID_no/Ser_no</td>
<td>Displays the identification/serial number of encoder 1.</td>
<td>Refer to: r0460, r0461, r0462, r0463, r0464</td>
</tr>
</tbody>
</table>

**Description:**
- Displays the identification/serial number of encoder 1.
- Index 0 = first character of the identification number
- Index x = 20 hex (blank) --> separation between the identification number and serial number
- Index y with contents = last character of the serial number

**Dependency:**
- Refer to: r0460, r0461, r0462, r0463, r0464

**Notice:**
- An ASCII table (excerpt) can be found, for example, in the appendix to the List Manual.

**Note:**
- The individual characters of the identification number/serial number are available coded as ASCII characters.
### Parameter List of parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Index</th>
<th>Dependency</th>
<th>Notice</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>r0466[0...27]</td>
<td>Encoder 2 identification number/serial number / Enc2 ID_no/Ser_no</td>
<td>Displays the identification/serial number of encoder 2.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Can be changed: -</td>
<td>Calculated: -</td>
<td>Access level: 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Data type: Unsigned8</td>
<td>Dynamic index: -</td>
<td>Func. diagram: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P-Group: Encoder</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Index 0 = first character of the identification number</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Index x = 20 hex (blank) --&gt; separation between the identification number of serial number</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Index x + 1 = 2F hex (slash) --&gt; separation between the identification number of serial number</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Index x + 2 = 20 hex (blank) --&gt; separation between the identification number of serial number</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Index x + 3 = first character of the serial number</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>...</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Index y with contents = last character of the serial number</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Refer to: r0460, r0461, r0462, r0463, r0464</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>An ASCII table (excerpt) can be found, for example, in the appendix to the List Manual.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The individual characters of the identification number/serial number are available coded as ASCII characters.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>r0470[0...2]</td>
<td>Redundant coarse value valid bits / Valid bits</td>
<td>Displays the valid bits of the redundant coarse position value.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Can be changed: -</td>
<td>Calculated: -</td>
<td>Access level: 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Data type: Unsigned16</td>
<td>Dynamic index: -</td>
<td>Func. diagram: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P-Group: Encoder</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Index:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0] = Encoder 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[1] = Encoder 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[2] = Reserved</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Refer to: p9323, p9523</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>r0471[0...2]</td>
<td>Redundant coarse value fine resolution bits / Fine bit</td>
<td>Displays the number of valid bits for the fine resolution of the redundant coarse position value.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Can be changed: -</td>
<td>Calculated: -</td>
<td>Access level: 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Data type: Integer16</td>
<td>Dynamic index: -</td>
<td>Func. diagram: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P-Group: Encoder</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Index:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0] = Encoder 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[1] = Encoder 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[2] = Reserved</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Refer to: p9324, p9524</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### r0472[0...2] Redundant coarse position value relevant bits / Relevant bits

**Parameter**

- **SERVO_S110-CAN**, **SERVO_S110-DP**, **SERVO_S110-PN**
- **Can be changed:** -
- **Data type:** Unsigned16
- **P-Group:** Encoder
- **Not for motor type:** -
- **Min:** Max
- **Expert list:** 1
- **Factory setting:**

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Incrementer</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>01</td>
<td>Encoder CRC least significant byte first</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>02</td>
<td>Redundant coarse position val. most significant bit left-aligned</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
</tbody>
</table>

**Description:** Displays the number of relevant bits for the redundant coarse position value.

**Index:**
- [0] = Encoder 1
- [1] = Encoder 2
- [2] = Reserved

**Dependency:** Refer to: p9315, p9515

### r0474[0...2] Redundant coarse position value configuration / Red pos config

**Parameter**

- **SERVO_S110-CAN**, **SERVO_S110-DP**, **SERVO_S110-PN**
- **Can be changed:** -
- **Data type:** Unsigned32
- **P-Group:** Encoder
- **Not for motor type:** -
- **Min:** Max
- **Expert list:** 1
- **Factory setting:**

**Description:** Displays the encoder configuration for the redundant coarse position value.

**Index:**
- [0] = Encoder 1
- [1] = Encoder 2
- [2] = Reserved

**Dependency:** Refer to: p9315, p9515

### r0475[0...2] Gx_XIST1 coarse position safe most significant bit / Gx_XIST1 safe MSB

**Parameter**

- **SERVO_S110-CAN**, **SERVO_S110-DP**, **SERVO_S110-PN**
- **Can be changed:** -
- **Data type:** Unsigned16
- **P-Group:** Encoder
- **Not for motor type:** -
- **Min:** Max
- **Expert list:** 1
- **Factory setting:**

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Incrementer</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>01</td>
<td>Encoder CRC least significant byte first</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>02</td>
<td>Redundant coarse position val. most significant bit left-aligned</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
</tbody>
</table>

**Description:** Displays the bit number for the safe most significant bit (MSB) of the Gx_XIST1 coarse position.

**Index:**
- [0] = Encoder 1
- [1] = Encoder 2
- [2] = Reserved

**Note:** MSB: Most Significant Bit

### r0479[0...2] CO: Diagnostics encoder position actual value Gn_XIST1 / Diag Gn_XIST1

**Parameter**

- **SERVO_S110-CAN**, **SERVO_S110-DP**, **SERVO_S110-PN**
- **Can be changed:** -
- **Data type:** Integer32
- **P-Group:** Encoder
- **Not for motor type:** -
- **Min:** Max
- **Expert list:** 1
- **Factory setting:**

**Description:** Displays the encoder actual position value Gn_XIST1 according to PROFIdrive for diagnostics.

In contrast to r0482, the value is updated in each DRIVE-CLiQ basic clock cycle and displayed with sign.
**Parameter**

**List of parameters**

**Index:**

- [0] = Encoder 1
- [1] = Encoder 2
- [2] = Reserved

**Caution:**

Following ramping-up or after a data set changeover, the new value is present at connector inputs which are interconnected to connector output r0479 and under certain circumstances take 100 ms to become available.

**Reason:**

These interconnections are updated in the background, unlike interconnections involving other connector outputs (e.g., CO: r0482).

The value is immediately available when non-cyclically reading r0479 (e.g., via the expert list).

---

**Cl: Signal source for encoder control word Gn_STW / Enc S_src Gn_STW**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN,</td>
<td>T</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>SERVO_S110-DP,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-PN</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:**

Sets the signal source for the encoder control word Gn_STW according to PROFIdrive.

**Index:**

- [0] = Encoder 1
- [1] = Encoder 2
- [2] = Reserved

**Note:**

When the function module "basic positioner" (r0108.4 = 1) is activated, the following BICO interconnection is established:


---

**CO: Encoder status word Gn_ZSW / Enc Gn_ZSW**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN,</td>
<td>-</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>SERVO_S110-DP,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-PN</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:**

Displays the encoder status word Gn_ZSW according to PROFIdrive.

**Index:**

- [0] = Encoder 1
- [1] = Encoder 2
- [2] = Reserved

**Bit field: Bit Signal name 1 signal 0 signal FP**

- **00 Function 1 active**
  - Yes
  - No
  - -

- **01 Function 2 active**
  - Yes
  - No
  - -

- **02 Function 3 active**
  - Yes
  - No
  - -

- **03 Function 4 active**
  - Yes
  - No
  - -

- **04 Value 1**
  - Displayed in r0483
  - Not present
  - -

- **05 Value 2**
  - Displayed in r0483
  - Not present
  - -

- **06 Value 3**
  - Displayed in r0483
  - Not present
  - -

- **07 Value 4**
  - Displayed in r0483
  - Not present
  - -

- **08 Measuring probe 1 deflected**
  - Yes
  - No
  - -

- **09 Measuring probe 2 deflected**
  - Yes
  - No
  - -

- **11 Encoder fault acknowledge active**
  - Yes
  - No
  - 9676

- **13 Absolute value cyclically**
  - Displayed in r0483
  - No
  - -

- **14 Parking encoder active**
  - Yes
  - No
  - -

- **15 Encoder fault**
  - Displayed in r0483
  - None
  - -

**Notice:**

Information on Gn_STW/Gn_ZSW can, e.g., be found in the following literature:

SINAMICS S120 Function Manual Drive Functions

**Note:**

Re bit 14:

Displays the acknowledgement for "activate parking encoder" (Gn_STW.14 = 1) or encoder position actual value (Gn_XIST1) invalid.
List of parameters

Parameter

Re bit 14, 15:
r0481.14 = 1 and r0481.15 = 0 can have one of the following causes:
- the encoder is parked.
- the encoder is de-activated.
- the encoder is being commissioned.
- no parameterized encoder available.
- encoder data set is being changed over.
r0481.14 = 1 and r0481.15 = 1 has the following significance:
An encoder error has occurred and the encoder position actual value (Gn_XIST1) is invalid.

### r0482[0...2]
**CO:** Encoder actual position value Gn_XIST1 / Enc Gn_XIST1

- **SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**
- **Can be changed:** -
- **Data type:** Unsigned32
- **Dynamic index:** -
- **P-Group:** Encoder
- **Not for motor type:** -
- **Min**
- **Max**
- **Access level:** 3
- **Func. diagram:** 1580, 2450, 4010, 4704, 4735, 4740
- **Unit selection:** -
- **Expert list:** 1
- **Units group:** -
- **Description:** Displays the encoder actual position value Gn_XIST1 according to PROFIdrive.
- **Index:**
  - [0] = Encoder 1
  - [1] = Encoder 2
  - [2] = Reserved
- **Note:**
  - this value is reset if necessary when the "parking encoder" (r0481.14) function is de-selected.
  - in this value, the measuring gear (p0432, p0433) is only taken into account when the position tracking is activated (p0411.0 = 1).

### r0483[0...2]
**CO:** Encoder actual position value Gn_XIST2 / Enc Gn_XIST2

- **SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**
- **Can be changed:** -
- **Data type:** Unsigned32
- **Dynamic index:** -
- **P-Group:** Encoder
- **Not for motor type:** -
- **Min**
- **Max**
- **Access level:** 3
- **Func. diagram:** 1580, 2450, 4010, 4704
- **Unit selection:** -
- **Expert list:** 1
- **Units group:** -
- **Description:** Displays the encoder actual position value Gn_XIST2 according to PROFIdrive.
- **Recommend.:** Possible causes of the error codes:
  - Error code 4097 and 4098: Defective Control Unit hardware.
  - Error codes 4099 and 4100: Too many measuring pulses have occurred.
- **Index:**
  - [0] = Encoder 1
  - [1] = Encoder 2
  - [2] = Reserved
- **Notice:** The encoder position actual value must be requested using the encoder control word Gn_STW.13.
- **Note:**
  - in this value, the measuring gear (p0432, p0433) is only taken into account when the position tracking is activated (p0411.0 = 1).
  - if GxZSW.15 = 1 (r0481), then an error code with the following significance is located in Gx_XIST2 (r0483):
    1: Encoder fault.
    2: Possible position shift in Gx_XIST1.
    3: Encoder parking not possible.
    4: Abort, reference mark search.
    5: Abort, retrieve reference value.
    6: Abort, flying measurement.
    7: Abort, retrieve measured value.
    8: Abort, absolute value transfer.
    3841: Function not supported.
Parameter

List of parameters

4097: Abort, reference mark search due to an initialization error.
4098: Abort, flying measurement due to an initialization error.
4099: Abort, reference mark search due to a measuring error.
4100: Abort, flying measurement due to a measuring error.

r0484[0...2]  **CO: Redundant coarse encoder position + CRC Gn_XIST1 / Enc red pos+CRC**

| SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN | Can be changed: - | Calculated: - | Access level: 3 |
| Data type: Unsigned32 | Dynamic index: - | Func. diagram: - |
| P-Group: Encoder | Units group: - | Unit selection: - |
| Not for motor type: - | Scaling: - | Expert list: 1 |
| Min | Max | Factory setting |

**Description:**
Displays the redundant coarse encoder position including CRC (Cyclic Redundancy Check).

Upper 16 bits:
CRC over the redundant coarse encoder position.

Lower 16 bits:
Redundant coarse encoder position.

On an SMx Sensor Module, the encoder coarse position count direction is opposite to r0482 (encoder actual value Gn_XIST1). The value contains 2 bit fine resolution.

With a DRIVE-CLiQ encoder, the encoder coarse position count direction is the same as r0482. The encoder coarse position contains 9 valid bits and no bits for fine resolution.

**Index:**
[0] = Encoder 1
[1] = Encoder 2
[2] = Reserved

**Dependency:**
The values are valid when the safety position actual value sensing is activated (p0430.19 = 1).

Refer to: p0430

**Note:**
This absolute value does not change, contrary to r0482, when de-selecting the function "parking axis".

r0487[0...2]  **Diagnostic encoder control word Gn_STW / Enc Gn_STW**

| SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN | Can be changed: - | Calculated: - | Access level: 3 |
| Data type: Unsigned16 | Dynamic index: - | Func. diagram: 1580, 4704, 4720, 4740 |
| P-Group: Encoder | Units group: - | Unit selection: - |
| Not for motor type: - | Scaling: - | Expert list: 1 |
| Min | Max | Factory setting |

**Description:**
Displays the encoder control word Gn_STW according to PROFIdrive for diagnostics.

**Index:**
[0] = Encoder 1
[1] = Encoder 2
[2] = Reserved

**Bit field:**

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Request function 1</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>01</td>
<td>Request function 2</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>02</td>
<td>Request function 3</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>03</td>
<td>Request function 4</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>04</td>
<td>Request command bit 0</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>05</td>
<td>Request command bit 1</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>06</td>
<td>Request command bit 2</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>07</td>
<td>Flying measurement mode/search for reference mark</td>
<td>Flying measurement</td>
<td>Reference marks</td>
<td>-</td>
</tr>
<tr>
<td>13</td>
<td>Request absolute value cyclic</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>14</td>
<td>Request parking encoder</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>15</td>
<td>Request acknowledge encoder fault</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
</tbody>
</table>

**Notice:**
Information on Gn_STW/Gn_ZSW should be taken from the corresponding product documentation.

**Note:**
The signal source for the encoder control word is set with p0480.
### p0488[0...2] Measuring probe 1 input terminal / Meas probe 1 inp

- **SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**
- **Can be changed:** U, T
- **Data type:** Integer16
- **P-Group:** Encoder
- **Not for motor type:** -
- **Min**
- **Max**
  - **Value:**
    - 0: No measuring probe
    - 1: DI/DO 9 (X132.2)
    - 2: DI/DO 10 (X132.3)
    - 3: DI/DO 11 (X132.4)
    - 7: DI/DO 8 (X132.1)
- **Index:**
  - [0] = Encoder 1
  - [1] = Encoder 2
  - [2] = Reserved
- **Dependency:** Refer to: p0489, p0490, p0728
- **Note:**
  - DI/DO: Bidirectional Digital Input/Output
  - The terminal must be set as input (p0728).
  - Refer to the encoder interface for PROFIdrive.
  - If parameterization is rejected, check whether the terminal is already being used in p0580, p0680, p2517 or p2518.

### p0489[0...2] Measuring probe 2 input terminal / Meas probe 2 inp

- **SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**
- **Can be changed:** U, T
- **Data type:** Integer16
- **P-Group:** Encoder
- **Not for motor type:** -
- **Min**
- **Max**
  - **Value:**
    - 0: No measuring probe
    - 1: DI/DO 9 (X132.2)
    - 2: DI/DO 10 (X132.3)
    - 3: DI/DO 11 (X132.4)
    - 7: DI/DO 8 (X132.1)
- **Index:**
  - [0] = Encoder 1
  - [1] = Encoder 2
  - [2] = Reserved
- **Dependency:** Refer to: p0488, p0490, p0728
- **Note:**
  - DI/DO: Bidirectional Digital Input/Output
  - The terminal must be set as input (p0728).
  - Refer to the encoder interface for PROFIdrive.
  - If parameterization is rejected, check whether the terminal is already being used in p0580, p0680, p2517 or p2518.

### p0490 Invert measuring probe or equivalent zero mark / Pr or ZM_equiv inv

- **CU_S110-CAN, CU_S110-DP, CU_S110-PN**
- **Can be changed:** U, T
- **Data type:** Unsigned32
- **P-Group:** Encoder
- **Not for motor type:** -
- **Min**
- **Max**
  - **Value:**
    - - - 0000 0000 0000 0000 bin
- **Description:** Setting to invert the digital input signals to connect a measuring probe or an equivalent zero mark.

---

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SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3
**Parameter**

**List of parameters**

<table>
<thead>
<tr>
<th>Bit field</th>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>08</td>
<td>DI/DO 8 (X132.1)</td>
<td>Inverted</td>
<td>Not inverted</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>09</td>
<td>DI/DO 9 (X132.2)</td>
<td>Inverted</td>
<td>Not inverted</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>DI/DO 10 (X132.3)</td>
<td>Inverted</td>
<td>Not inverted</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>DI/DO 11 (X132.4)</td>
<td>Inverted</td>
<td>Not inverted</td>
<td>-</td>
</tr>
</tbody>
</table>

**Dependency:**
- Refer to: p0488, p0489, p0493, p0495, p0728

**Note:**
- The terminal must be set as input.
- When the measuring probe or the equivalent zero mark is inverted, this has no effect on the status displays of the digital inputs (r0721, r0722, r0723).

**DI/DO: Bidirectional Digital Input/Output**

**Description:**
Sets the behavior for the ENCODER fault response (motor encoder).
This means, for example, if an encoder fault occurs, encoderless operation can be automatically selected with a shutdown behavior that can be selected.

**Value:**
- 0: Encoder fault results in OFF2
- 1: Encoder fault results in encoderless operation and oper. continues
- 2: Encoder fault results in encoderless operation and OFF1
- 3: Encoder fault results in encoderless operation and OFF3
- 4: Encoder fault results in DC braking
- 5: Encoder fault results in encoderless op, operation continues, alarm

**Dependency:**
- The following parameters are relevant for encoderless operation.
  - Refer to: p0341, p0342, p1470, p1472, p1517, p1612, p1755
  - Refer to: F07575

**Caution:**
For a value = 1, 2, 3, 5 the following applies:
- encoderless operation must have been started.
- if, for synchronous motors, an encoder fault occurs below the switchover speed p1755, when switching over to encoderless operation, the motor can stall.
For a value = 1, 5 the following applies:
- in spite of the motor encoder fault that has occurred, the motor continues to operate.

**Note:**
For a value = 1, 2, 3, the following applies:
- for encoderless operation the following condition must be fulfilled: p1800 >= n / (2 * p0115[0]), n = 1, 2, etc.
- Refer to the status signal "encoderless operation due to a fault" (BO: r1407.13).
- If, when setting r1407.13, a different drive data set is selected (e.g. interconnection from p0820), then the open-loop or closed-loop control type p1300 of this data set must match that of the original data set (e.g. p1300 = 21). Encoderless closed-loop controlled operation is kept when changing over.
For a value = 4, the following applies:
- the value can only be set for all motor data sets when p1231 = 4
- the function is not supported on synchronous motors
- For induction motors, DC braking is initiated on an encoder fault. DC braking must be commissioned (p1232, p1233, p1234).
### p0492 Square-wave encoder, maximum speed difference per sampling cycle / \( n_{\text{dif max/samp_cyc}} \)

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
<th>Can be changed: U, T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type: FloatingPoint32</td>
<td>Dynamic index: -</td>
</tr>
<tr>
<td>P-Group: Encoder</td>
<td>Units group: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td>0.00 [rpm]</td>
<td>210000.00 [rpm]</td>
</tr>
<tr>
<td>Factory setting</td>
<td>0.00 [rpm]</td>
</tr>
</tbody>
</table>

**Description:**
Sets the maximum permissible speed difference within the current controller sampling time for squarewave encoders.

When the value is exceeded, depending on p0491, either encoderless closed-loop speed/torque control is selected or the drive is powered down.

**Dependency:**
Refer to: F31118, A31418, F32118, A32418

**Note:**
- For a value of 0.0, the speed change monitoring is disabled.
- if the set maximum speed difference is only exceeded for one sampling time of the current controller, then an appropriate alarm is output. However, if the maximum speed difference is exceeded over several sampling times, then a corresponding fault is output.

### p0493[0...n] Zero mark selection, input terminal / ZM_sel inp_term

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
<th>Can be changed: U, T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type: Integer16</td>
<td>Dynamic index: EDS, p0140</td>
</tr>
<tr>
<td>P-Group: Encoder</td>
<td>Units group: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>Factory setting</td>
<td>0</td>
</tr>
</tbody>
</table>

**Description:**
Sets the input terminal for selecting the reference mark via BERO/switching signal when performing referencing with several zero marks.

The encoder interface supplies the position of the reference mark, which was detected immediately after the positive edge of the BERO signal.

**Value:**
- 0: No selection via BERO
- 1: DI/DO 9 (X132.2)
- 2: DI/DO 10 (X132.3)
- 3: DI/DO 11 (X132.4)
- 7: DI/DO 8 (X132.1)

**Dependency:**
Refer to: p0490

**Notice:**
For CU310, CX32, NX10 and NX15, only DI/DO 9, 10, 11 can be selected as fast inputs (refer to the Equipment Manual).

**Note:**
- Refer to the encoder interface for PROFIdrive.
- The terminal must be set as input (p0728).
- For p0493 = 0 (factory setting) the following applies:
  - there is no logic operation between the reference mark search and an input signal.
- For p0493 > 0, the following applies:
  - the positive edge of the input signal is evaluated. If the negative edge is to be evaluated, signal inversion must be parameterized via p0490.
  - if a parameter change is rejected, a check should be performed as to whether the input terminal is already being used in p0580, p0680, p2517, or p2518.
### p0494[0...n] Equivalent zero mark, input terminal / ZM_equiv input

<table>
<thead>
<tr>
<th>Description</th>
<th>Selects the input terminal for connecting an equivalent zero mark (external encoder zero mark).</th>
</tr>
</thead>
</table>
| Value       | 0: No equivalent zero mark (evaluation of the encoder zero mark)  
1: DI/DO 9 (X132.2)  
2: DI/DO 10 (X132.3)  
3: DI/DO 11 (X132.4)  
7: DI/DO 8 (X132.1) |
| Dependency  | Refer to: p0490 |
| Notice      | For p0494 = 0 (factory setting), the setting in p0495 is effective. |
| Note        | Refer to the encoder interface for PROFIdrive. The terminal must be set as input. |

### p0495[0...2] Equivalent zero mark, input terminal / ZM_equiv input

<table>
<thead>
<tr>
<th>Description</th>
<th>Selects the input terminal for connecting an equivalent zero mark (external encoder zero mark).</th>
</tr>
</thead>
</table>
| Value       | 0: No equivalent zero mark (evaluation of the encoder zero mark)  
1: DI/DO 9 (X132.2)  
2: DI/DO 10 (X132.3)  
3: DI/DO 11 (X132.4)  
7: DI/DO 8 (X132.1) |
| Dependency  | Refer to: p0490, p0494 |
| Notice      | For p0494 > 0, the setting in p0494 and p0495 is invalid. |
| Note        | Refer to the encoder interface for PROFIdrive. The terminal must be set as input.  
For p0495 = 0 (factory setting), the encoder zero mark is evaluated as zero mark.  
For p0495 > 0, the following applies:  
Depending on the direction of motion, the positive or negative edge at the appropriate input is evaluated.  
- increasing position actual values (r0482) --> the 0/1 edge is evaluated.  
- decreasing position actual values (r0482) --> the 1/0 edge is evaluated.  
Only one zero mark is supported. If function 2, 3 or 4 is selected, this results in a fault message in Gn_ZSW.  
The inversion of the inputs via p0490 affects the function "referencing with equivalent zero mark". This is the reason that the edge evaluation is interchanged as a function of the direction of motion.  
An input can only be assigned to one encoder as measuring probe 1, 2 or equivalent zero mark. Exception: The same encoder can be simultaneously used as measuring probe and equivalent zero mark as both functions cannot be simultaneously requested. |
<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selects the trace signal to be output in r0497, r0498 and r0499 for encoder diagnostics.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>r0497: Mechanical revolution</td>
<td>1</td>
</tr>
<tr>
<td>r0499: Fine position X (-A/2)</td>
<td>11</td>
</tr>
<tr>
<td>r0499: Fine position Y (-B/2)</td>
<td></td>
</tr>
<tr>
<td>r0499: Fine position Phi</td>
<td></td>
</tr>
<tr>
<td>r0499: Offset correction X</td>
<td></td>
</tr>
<tr>
<td>r0499: Offset correction Y</td>
<td></td>
</tr>
<tr>
<td>r0499: Phase correction X</td>
<td></td>
</tr>
<tr>
<td>r0499: Amplitude correction Y</td>
<td></td>
</tr>
<tr>
<td>r0499: Cubic correction X</td>
<td></td>
</tr>
<tr>
<td>r0499: Fine position X</td>
<td></td>
</tr>
<tr>
<td>r0499: Oversampling channel A</td>
<td></td>
</tr>
<tr>
<td>r0499: Oversampling channel B</td>
<td></td>
</tr>
<tr>
<td>r0498: Fan-out, amount</td>
<td></td>
</tr>
<tr>
<td>r0498: Oversampling amount</td>
<td></td>
</tr>
<tr>
<td>r0498: Raw value, track C</td>
<td></td>
</tr>
<tr>
<td>r0498: Raw value, track D</td>
<td></td>
</tr>
<tr>
<td>r0498: CD position X (-D/2)</td>
<td></td>
</tr>
<tr>
<td>r0498: CD position Y (C/2)</td>
<td></td>
</tr>
<tr>
<td>r0498: CD position Phi</td>
<td></td>
</tr>
<tr>
<td>r0498: CD pos. Phi - mech. revolution</td>
<td></td>
</tr>
<tr>
<td>r0498: Zero mark status</td>
<td></td>
</tr>
<tr>
<td>r0498: Raw value, track R</td>
<td></td>
</tr>
<tr>
<td>r0498: Raw value, track A</td>
<td></td>
</tr>
<tr>
<td>r0499: Raw value, track R</td>
<td></td>
</tr>
<tr>
<td>r0497: Absolute position serial</td>
<td></td>
</tr>
<tr>
<td>r0497: Absolute position, incremental</td>
<td></td>
</tr>
<tr>
<td>r0497: Zero mark position</td>
<td></td>
</tr>
<tr>
<td>r0497: Correction absolute position difference</td>
<td></td>
</tr>
<tr>
<td>r0498: Raw temperature, r0499: Temperature in 0.1 ºC</td>
<td></td>
</tr>
<tr>
<td>r0498: Resistance in 0.1 Ohm, r0499: Resistance in 0.1 ºC</td>
<td></td>
</tr>
<tr>
<td>r0497: Resistance 2500 Ohm</td>
<td></td>
</tr>
<tr>
<td>r0497: Absolute speed difference (dn/dt)</td>
<td></td>
</tr>
<tr>
<td>r0497: Xact1 corrected quadrants</td>
<td></td>
</tr>
<tr>
<td>r0498: Raw val chann. A, r0499: raw val chann. A</td>
<td></td>
</tr>
<tr>
<td>r0498: fine pos chann. A, r0499: fine pos chann. A</td>
<td></td>
</tr>
<tr>
<td>r0498: fine pos before characteristic, r0499: -</td>
<td></td>
</tr>
<tr>
<td>r0498: Transformation ratio, r0499: phase</td>
<td></td>
</tr>
<tr>
<td>r0498: Sensor S1 (raw)</td>
<td></td>
</tr>
<tr>
<td>r0498: Sensor S5 (raw)</td>
<td></td>
</tr>
<tr>
<td>r0499: Sensor S1 (cal)</td>
<td></td>
</tr>
<tr>
<td>r0499: Sensor S5 (cal)</td>
<td></td>
</tr>
<tr>
<td>r0498: Sensor S1 (raw)</td>
<td></td>
</tr>
<tr>
<td>r0498: Sensor S5 (raw)</td>
<td></td>
</tr>
<tr>
<td>r0499: Sensor S1 (cal)</td>
<td></td>
</tr>
<tr>
<td>r0499: Sensor S5 (cal)</td>
<td></td>
</tr>
</tbody>
</table>

Index: [0] = Encoder 1
[1] = Encoder 2
[2] = Reserved

Dependency: Refer to: r0497, r0498, r0499

Notice: The setting option depends on the following properties:
Sensor Module type, hardware version, firmware version (Sensor Module and Control Units), order number (last digit).
Not all combinations are supported.

Note:
Re p0496 = 1: 360 ° <-> 2³2
Re p0496 = 10 (resolver): 2900 mV <-> 26214 dec
Re p0496 = 10, 20 (sin/cos 1 Vpp, EnDat): 500 mV <-> 21299 dec
Re p0496 = 11 (resolver): 2900 mV <-> 13107 dec, internal processor offset is corrected
Re p0496 = 11, 21 (sin/cos 1 Vpp, EnDat): 500 mV <-> 10650 dec, internal processor offset is corrected
Re p0496 = 12: 180 ° fine position <-> 32768 dec
Re p0496 = 13 (resolver): 2900 mV <-> 13107 dec
Re p0496 = 13 (sin/cos 1 Vpp, EnDat): 500 mV <-> 10650 dec
Parameter

List of parameters

Re p0496 = 14: 1 ° <--> 286 dec, 100% <--> 16384 dec
Re p0496 = 15: 100 % <--> 16384 dec
Re p0496 = 16: (resolver): channel A: 2900 mV <--> 26214 dec, channel B: 2900 mV <--> 26214 dec
Re p0496 = 16: (sin/cos 1 Vpp, EnDat): channel A: 500 mV <--> 21299 dec, channel B: 500 mV <--> 21299 dec
Re p0496 = 17 (resolver): absolute value: 2900 mV <--> 13107 dec, number: 1 ... 8
Re p0496 = 17 (sin/cos 1 Vpp, EnDat): absolute value 500 mV <--> 10650 dec, number: 1 ... 8
Re p0496 = 18 (resolver): angle: signal period <--> 2^16, absolute value: 2900 mV <--> 13107 dec
Re p0496 = 18 (sin/cos 1 Vpp, EnDat): angle: signal period <--> 2^16, absolute value: 500 mV <--> 10650 dec
Re p0496 = 22: 180 ° <--> 32768 dec
Re p0496 = 23, 24: r0497.31 (r0499.15) set for at least 1 current controller cycle when encoder zero mark detected
Re p0496 = 24, 25: 500 mV <--> 21299 dec
Re p0496 = 30: Rotary: 1 singleturn measuring step <--> 1 dec, linear: 1 measuring step <--> 1 dec
Re p0496 = 31: Absolute position, incremental in 1/4 encoder pulses
Re p0496 = 32: Zero mark position in 1/4 encoder pulses
Re p0496 = 33: counter offset absolute value in 1/4 encoder pulses
Re p0496 = 40: r0498 <--> (R_KTY/1 kOhm - 0.9) * 32768
Re p0496 = 42: 2500 Ohm <--> 2^32
Re p0496 = 51: 1 rpm <--> 1000 dec
Re p0496 = 52: In 1/4 encoder pulses
Re p0496 = 60: voltage, channel A in mV, voltage, channel B in mV
Re p0496 = 61: Channel A: encoder periods <--> 2^16, channel B: encoder periods <--> 2^16
Re p0496 = 62: encoder periods <--> 2^16
Re p0496 = 70: r: 100% <--> 10000 dec, phase: 180 ° <--> 18000 dec
Re p0496 = 80, 81, 85, 86: 1V <--> 1000 inc

r0497[0...2] CO: Encoder diagnostic signal double word / Enc diag DW
SERVO_S110-CAN,
SERVO_S110-DP,
SERVO_S110-PN
Can be changed: - Calculated: - Access level: 4
Data type: Unsigned32 Dynamic index: - Func. diagram: -
P-Group: Encoder Units group: - Unit selection: -
Not for motor type: - Scaling: - Expert list: 1
Min - Max Factory setting

Description: Displays the trace signal for encoder diagnostics (double word).
The signal to be output is selected in p0496.

Index: [0] = Encoder 1
[1] = Encoder 2
[2] = Reserved

Dependency: Refer to: p0496, r0498, r0499

r0498[0...2] CO: Encoder diagnostic signal low word / Enc diag low word
SERVO_S110-CAN,
SERVO_S110-DP,
SERVO_S110-PN
Can be changed: - Calculated: - Access level: 4
Data type: Integer16 Dynamic index: - Func. diagram: -
P-Group: Encoder Units group: - Unit selection: -
Not for motor type: - Scaling: - Expert list: 1
Min - Max Factory setting

Description: Displays the trace signal for encoder diagnostics (low component).
The signal to be output is selected in p0496.

Index: [0] = Encoder 1
[1] = Encoder 2
[2] = Reserved

Dependency: Refer to: p0496, r0497, r0499
### r0499[0...2]

**Description:** Displays the trace signal for encoder diagnostics (high component). The signal to be output is selected in p0496.

**Index:**
- [0] = Encoder 1
- [1] = Encoder 2
- [2] = Reserved

**Dependency:** Refer to: p0496, r0497, r0498

### p0500

**Description:** Sets the technology application. The parameter influences the calculation of open-loop and closed-loop control parameters that is e.g. initiated using p0578.

**Value:**
- 100: Standard drive (SERVO)
- 101: Feed drive (limit current limitation)
- 102: Spindle drive (rated current limitation)

**Dependency:** Refer to: p1520, p1521, p1530, p1531, p2000, p2175, p2177

**Caution:** After changing over the technological application and then calculating the open-loop and closed-loop parameters, the behavior of the motor can have changed very significantly (e.g. the same setpoint results in a higher speed due to a different reference speed). For this reason extreme caution must be taken when the motor is started for the first time.

**Note:** The calculation of parameters dependent on the technology application can be called up as follows:
- when exiting quick commissioning using p3900 > 0
- when writing p0340 = 1, 3, 5
- when writing p0578 = 1

For p0500 = 100 and when the calculation is initiated, the following parameters are set:
- p1520 = rated motor torque (r0333)
- p1530 = torque at the maximum motor current (p0323) and power at the maximum motor current (p0323) and rated motor speed (p0311)
- p2000 = rated motor speed (p0311)
- p2175 = factory setting
- p2177 = factory setting

For p0500 = 101 and when the calculation is initiated, the following parameters are set:
- p1521 = torque at the maximum motor current (p0323)
- p1531 = power at the maximum motor current (p0323) and rated motor speed (p0311)
- p2000 = rated motor speed (p0311)
- p2175 = maximum value
- p2177 = 0.2 s

For p0500 = 102 and when the calculation is initiated, the following parameters are set:
- p1520 = rated motor torque (r0333)
- p1530 = torque at the maximum motor current (p0323) and power at the maximum motor current (p0323) and rated motor speed (p0311)
- p2000 = maximum motor speed (p0322) if p0322 is not equal to 0, otherwise rated motor speed (p0311)
Parameter

List of parameters

- p2175 = factory setting
- p2177 = factory setting

**p0505** Selecting the system of units / Unit sys select

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Can be changed:</strong> C2(5)</td>
</tr>
<tr>
<td><strong>Data type:</strong> Integer16</td>
</tr>
<tr>
<td><strong>P-Group:</strong> Applications</td>
</tr>
<tr>
<td><strong>Not for motor type:</strong> -</td>
</tr>
<tr>
<td><strong>Min</strong></td>
</tr>
<tr>
<td>1</td>
</tr>
</tbody>
</table>

**Description:** Adjustable parameter of the actual system of units.

**Value:**
1: SI system of units
2: System of units, referred/SI
3: US system of units
4: System of units, referred/US

**Dependency:** The parameter cannot be changed if the master control was fetched.

**Caution:** If a per unit representation is selected and if the reference parameters (e.g. p2000) are subsequently changed, then the physical significance of several control parameters is also adapted at the same time. As a consequence, the control behavior can change (see p1576, p1621, p1744, p1752, p1755 and p1609, p1612, p1619, p1620).

**Note:** Reference parameter for the unit system % are, for example, p2000 ... p2004. Depending on what has been selected, these are displayed using either SI or US units.

**p0528** Controller gain, system of units / Ctrl_gain unit_sys

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Can be changed:</strong> C2(5)</td>
</tr>
<tr>
<td><strong>Data type:</strong> Integer16</td>
</tr>
<tr>
<td><strong>P-Group:</strong> Applications</td>
</tr>
<tr>
<td><strong>Not for motor type:</strong> -</td>
</tr>
<tr>
<td><strong>Min</strong></td>
</tr>
<tr>
<td>0</td>
</tr>
</tbody>
</table>

**Description:** Sets the system of units for the controller gains.

**Value:**
0: Representation, physical/% (p0505)
1: Representation, no dimensions (referred)

**Note:** For p0528 = 0 (physical%), the following applies:
Using p0505, the dependent parameters can be changed over between physical and % representation.
For SERVO (r0107) the following applies:
The parameter is pre-assigned a value of 0 and cannot be changed.

**p0530[0...n]** Bearing type selection / Bearing type sel

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Can be changed:</strong> C2(1, 3)</td>
</tr>
<tr>
<td><strong>Data type:</strong> Unsigned16</td>
</tr>
<tr>
<td><strong>P-Group:</strong> Motor</td>
</tr>
<tr>
<td><strong>Not for motor type:</strong> FEM</td>
</tr>
<tr>
<td><strong>Min</strong></td>
</tr>
<tr>
<td>0</td>
</tr>
</tbody>
</table>

**Description:** Sets the bearing type.
0 = No selection
1 = Manual entry
101 = STANDARD
102 = PERFORMANCE
103 = HIGH PERFORMANCE
104 = ADVANCED LIFETIME

**Dependency:** Refer to: p0301, p0531, p1082

If the bearing type changes the bearing code number (p0531) is pre-assigned accordingly.
**Caution:**
If a valid bearing type (p0530) is entered, the parameters in the bearing list cannot be changed (write protection). Write protection is canceled if bearing type 1 is entered.

**Notice:**
If p0530 is changed during quick commissioning (p0010 = 1), then the maximum speed p1082, which is also associated with quick commissioning, is pre-assigned appropriately. This is not the case when commissioning the motor (p0010 = 3). The maximum speed of the bearing is factored into the limit for the maximum speed p1082.

**Note:**
For a motor with DRIVE-CLIQ, p0530 can only be changed to the value 1 (manual entry).

### p0531[0...n] Bearing code number selection / Bear. code num sel

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Can be changed</th>
<th>Calculated</th>
<th>Dynamic index</th>
<th>Access level</th>
<th>Access level</th>
<th>Access level</th>
<th>Expert list</th>
</tr>
</thead>
<tbody>
<tr>
<td>p0531</td>
<td>Display and setting the bearing code number. It is pre-assigned automatically (from the parameter lists which are available internally) when p0301 and p0530 are entered and cannot be changed (write protection). The information in p0530 should be observed when removing write protection. When changing the bearing code number (except in the case of changing the value to 0), all of the bearing parameters are pre-assigned from the parameter lists which are available internally.</td>
<td>C2(3)</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dependency: Refer to: p0301, p0530, p1082</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Notice: If p0531 is changed during quick commissioning (p0010 = 1), then the maximum speed p1082, which is also associated with quick commissioning, is pre-assigned appropriately. This is not the case when commissioning the motor (p0010 = 3). The maximum speed of the bearing is factored into the limit for the maximum speed p1082.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Note: p0531 cannot be changed on a motor with DRIVE-CLIQ.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### p0532[0...n] Bearing maximum speed / Bearing n_max

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Can be changed</th>
<th>Calculated</th>
<th>Dynamic index</th>
<th>Access level</th>
<th>Access level</th>
<th>Access level</th>
<th>Expert list</th>
</tr>
</thead>
<tbody>
<tr>
<td>p0532</td>
<td>Sets the maximum speed for the bearing.</td>
<td>C2(1, 3)</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dependency: Refer to: p1082</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Caution: This parameter is pre-assigned in the case of motors from the motor list (p0301) if a bearing type (p0530) or a bearing code (p0531) is selected. When selecting a catalog motor, this parameter cannot be changed (write protection). The information in p0530 should be observed when removing write protection.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Notice: If p0532 is changed during quick commissioning (p0010 = 1), then the maximum speed p1082, which is also associated with quick commissioning, is pre-assigned appropriately. This is not the case when commissioning the motor (p0010 = 3). The maximum speed of the bearing is factored into the limit for the maximum speed p1082.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### p0570 Inhibit list values effective number / Inhibit list no

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Can be changed</th>
<th>Calculated</th>
<th>Dynamic index</th>
<th>Access level</th>
<th>Access level</th>
<th>Access level</th>
<th>Expert list</th>
</tr>
</thead>
<tbody>
<tr>
<td>p0570</td>
<td>Sets the number of parameters in the inhibit list p0571 that should be withdrawn from the automatic motor and closed-loop control parameter calculation (refer to p0340, p0578), starting from index 0.</td>
<td>U, T</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Note: Defines the number of entries in p0571 that should be taken into account. This means that a value of 0 de-activates the complete list.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## List of parameters

### p0571[0...49] Inhibit list, motor/closed-loop control parameter calculation / Inhib list calc

<table>
<thead>
<tr>
<th>Data type: Integer16</th>
<th>Dynamic index: -</th>
<th>Func. diagram: -</th>
<th>Access level: 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-Group: Applications</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
</tr>
<tr>
<td><strong>Min</strong></td>
<td><strong>Max</strong></td>
<td><strong>Factory setting</strong></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>2142</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

**Description:**
The inhibit list contains parameters that should be withdrawn from the automatic motor and closed-loop control parameter calculation (p0340, p0578).

**Value:**
- 0: No parameter
- 348: Speed at the start of field weakening Vdc = 600 V
- 600: Motor temperature sensor
- 640: Current limit
- 1082: Maximum speed
- 1441: Actual speed smoothing time
- 1460: Speed controller P gain
- 1462: Speed controller integral time
- 1470: Speed controller P gain, encoderless
- 1472: Speed controller integral time, encoderless
- 1520: Torque limit upper/motoring
- 1521: Torque limit lower/regenerative
- 1530: Power limit motoring
- 1531: Power limit regenerative
- 1590: Flux controller P gain
- 1592: Flux controller integral time
- 1656: Activates current setpoint filter
- 2141: Speed threshold 1
- 2142: Hysteresis speed 1

**Note:**
p0570 defines the number of entries (starting at index 0) for which the inhibit should apply. p0572 can be used to define for which drive data sets the inhibit list should apply.

If a motor data set is entered into a parameter number, then this is not overwritten as soon as only one drive data set refers to the motor data set (p0186).

### p0572[0...n] Activate inhibit list / Act inhib list

<table>
<thead>
<tr>
<th>Data type: Integer16</th>
<th>Dynamic index: DDS, p0180</th>
<th>Func. diagram: -</th>
<th>Access level: 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-Group: Applications</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
</tr>
<tr>
<td><strong>Min</strong></td>
<td><strong>Max</strong></td>
<td><strong>Factory setting</strong></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

**Description:**
Enable ID as to whether the parameters of the inhibit list p0571 should be overwritten when calculating the motor and closed-loop control parameters for the particular drive data set (index = DDS).

**Value:**
- 0: No
- 1: Yes

**Note:**
- 0: The automatic calculation (p0340, p0578) also overwrites the parameters of list p0571.
- 1: The automatic calculation (p0340, p0578) does not overwrite the parameters of list p0571.

### p0573 Inhibit automatic reference value calculation / Inhibit calc

<table>
<thead>
<tr>
<th>Data type: Integer16</th>
<th>Dynamic index: -</th>
<th>Func. diagram: -</th>
<th>Access level: 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-Group: Applications</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
</tr>
<tr>
<td><strong>Min</strong></td>
<td><strong>Max</strong></td>
<td><strong>Factory setting</strong></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

**Description:**
Setting to inhibit the calculation of reference parameters (e.g. p2000) when automatically calculating the motor and closed-loop control parameters (p0340, p3900).
## List of parameters

### p0578[0...n] Calculate technology-dependent parameters / Calc tec par

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Notice</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p0578</td>
<td>Calculate technology-dependent parameters / Calc tec par</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-CAN</td>
<td>Can be changed: C2(5), T</td>
<td>Calculated:</td>
<td>Access level: 2</td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-DP</td>
<td>Data type: Integer16</td>
<td>Dynamic index: DDS, p0180</td>
<td>Func. diagram: -</td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-PN</td>
<td>P-Group: Applications</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### p0580 Measuring probe, input terminal / MT input terminal

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Notice</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p0580</td>
<td>Measuring probe, input terminal / MT input terminal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-CAN</td>
<td>Can be changed: U, T</td>
<td>Calculated:</td>
<td>Access level: 3</td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-DP</td>
<td>Data type: Integer16</td>
<td>Dynamic index: -</td>
<td>Func. diagram: -</td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-PN</td>
<td>P-Group: Encoder</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
<td></td>
</tr>
<tr>
<td></td>
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<td>Scaling: -</td>
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<tr>
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<td>Max</td>
<td>Factory setting</td>
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<tr>
<td>0</td>
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<td></td>
</tr>
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</table>

### p0595 Selecting technological units / Select tech units

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Notice</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p0595</td>
<td>Selecting technological units / Select tech units</td>
<td></td>
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</tr>
<tr>
<td>SERVO_S110-CAN</td>
<td>Can be changed: C2(5)</td>
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<td>SERVO_S110-DP</td>
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<td>SERVO_S110-PN</td>
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<td>Scaling: -</td>
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<td>Factory setting</td>
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<tr>
<td>1</td>
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</tr>
</tbody>
</table>

---

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SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3
### Parameter

#### List of parameters

**Value:**

1:  
   - %
2:  
   - 1 referred, no dimensions
3:  
   - bar
4:  
   - °C
5:  
   - Pa
6:  
   - ltr/s
7:  
   - m³/s
8:  
   - ltr/min
9:  
   - m³/min
10:  
    - ltr/h
11:  
    - m³/h
12:  
    - kg/s
13:  
    - kg/min
14:  
    - kg/h
15:  
    - t/min
16:  
    - t/h
17:  
    - N
18:  
    - kN
19:  
    - Nm
20:  
    - °F
21:  
    - gallon/s
22:  
    - inch³/s
23:  
    - gallon/min
24:  
    - inch³/min
25:  
    - gallon/h
26:  
    - inch³/h
27:  
    - lb/s
28:  
    - lb/min
29:  
    - lb/h
30:  
    - lbf
31:  
    - lbf ft
32:  
    - lbf

**Dependency:**

Only units of parameters with unit group 9_1 can be changed over using this parameter.

Refer to: p0596

---

**p0596 Reference quantity, technological units / Ref tech units**

**Can be changed:** T

**Data type:** FloatingPoint32

**P-Group:** -

**Not for motor type:** -

**Calculated:** -

**Dynamic index:** -

**Units group:** -

**Unit selection:** -

**Expert list:** 1

**Access level:** 1

**Func. diagram:** -

**Min:** 0.01

**Max:** 340.28235E36

**Factory setting:** 1.00

**Description:**

Sets the reference quantity for the technological units. When changing over using changeover parameter 595 to absolute units, all of the parameters involved refer to the reference quantity.

**Dependency:**

Refer to: p0595

---

**p0600[0...n] Motor temperature sensor for monitoring / Mot temp_sensor**

**Can be changed:** C2(3), U, T

**Data type:** Integer16

**P-Group:** Motor

**Not for motor type:** -

**Calculated:** CALC_MOD_ALL

**Dynamic index:** MDS, p0130

**Units group:** -

**Unit selection:** -

**Expert list:** 1

**Access level:** 2

**Func. diagram:** 8016

**Min:** 0

**Max:** 11

**Factory setting:** 1

**Description:**

Sets the sensor to monitor the motor temperature.

**Value:**

0:  
   - No sensor
1:  
   - Temperature sensor via encoder 1
10:  
    - Temperature sensor via a BICO interconnection
11:  
    - Temperature sensor via Motor Module / CU terminals
**Dependency:**
Refer to: r0458, p0601, p0603

**Caution:**
If, for a selected temperature sensor (p0600 > 0), the motor temperature sensor is not connected but another encoder, then the temperature adaptation of the motor resistances must be switched out. Otherwise, in controlled-loop operation, torque errors will occur that will mean that the drive will not be able to be stopped.

**Notice:**
The parameter is calculated in the drive using p0340 and is inhibited for p0340 > 0.

**Note:**
Re p0600 = 0:
With induction motors, the motor temperature is calculated using the motor temperature model (see also p0612, bit 1).
Re p0600 = 10:
The BICO interconnection should be executed via connector input CI: p0603.
Re p0600 = 11:
For SINAMICS S120 AC Drive (AC/AC) and using the Control Unit Adapter CUA31, the temperature sensor is connected at the adapter (X210).

<table>
<thead>
<tr>
<th>p0601[0...n]</th>
<th>Motor temperature sensor type / Mot_temp_sens type</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Can be changed: C2(3), U, T</td>
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<tr>
<td>Data type: Integer16</td>
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</tr>
<tr>
<td>P-Group: Motor</td>
<td>Dynamic index: MDS, p0130</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Units group: -</td>
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<tr>
<td>Min</td>
<td>Scaling: -</td>
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<tr>
<td>Max</td>
<td>Factory setting</td>
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<tr>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

**Description:**
Sets the sensor type for the motor temperature monitoring.

**Value:**
0: No sensor
1: PTC alarm & timer
2: KTY84
3: KTY84 and PTC (only for motors with DRIVE-CLiQ):

**Dependency:**
The thermal motor model is only calculated for p0612.1 = 1.

**Note:**
The temperature sensor for the temperature evaluation is set in p0600.
For p0600 = 10 (temperature sensor via a BICO interconnection), the setting in p0601 has no significance.
Information on using temperature sensors is provided in the following literature:
- hardware description of the appropriate components
- SINAMICS S120 Commissioning Manual
Re p0601 = 1 (PTC alarm & timer):
Tripping resistance = 1650 Ohm.
After the tripping resistance has been exceeded, an appropriate alarm is output and after the delay time set in p0606 has expired, an appropriate fault is output.
Re p0601 = 3 (KTY84 and PTC (only for motors with DRIVE-CLiQ)):
For motors with DRIVE-CLiQ and 2 temperature sensors, the value is automatically set.

<table>
<thead>
<tr>
<th>p0603</th>
<th>CI: Motor temperature signal source / Mot temp S_src</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Can be changed: C2(3), T</td>
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<tr>
<td>Data type: Unsigned32 / FloatingPoint32</td>
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<tr>
<td>P-Group: Motor</td>
<td>Dynamic index: -</td>
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<tr>
<td>Not for motor type: -</td>
<td>Units group: -</td>
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<td>Min</td>
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<td>Max</td>
<td>Factory setting</td>
</tr>
<tr>
<td>-</td>
<td>0</td>
</tr>
</tbody>
</table>

**Description:**
Sets the signal source to evaluate the motor temperature via a BICO interconnection.

**Dependancy:**
Refer to: p0600

**Note:**
Temperature sensor KTY: Valid temperature range -48 °C ... 248 °C.
PTC temperature sensor:
For a value = -50 °C, the following applies: Motor temperature < nominal response temperature of the PTC.
For a value = 250 °C, the following applies: Motor temperature >= nominal response temperature of the PTC.
Note:
When using a Terminal Module 31 (TM31), the following applies:
- the sensor type used is set using p4100.
- the temperature signal is interconnected using CO: r4105.

Description:
Sets the alarm threshold for monitoring the motor temperature.

Dependency:
Refer to: p0606

Caution:
When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.

Note:
The hysteresis for canceling the alarm is 2 Kelvin.
When quick commissioning is exited with p3900 > 0, then the parameter is reset if a catalog motor has not been selected (refer to p0300).

Description:
Sets the fault threshold for monitoring the motor temperature.

Caution:
When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.

Note:
The hysteresis for canceling the fault is 2 Kelvin.
When quick commissioning is exited with p3900 > 0, then the parameter is reset if a catalog motor has not been selected (refer to p0300).

Description:
Sets the timer for the alarm threshold for the motor temperature monitoring function.

This timer is started when the temperature alarm threshold (p0604) is exceeded.
If the timer expires before the temperature in the meantime falls below the alarm threshold, the fault F07011 is output.
If the temperature fault threshold (p0605) is prematurely exceeded before the timer has expired, then fault F07011 is immediately output.
As long as the motor temperature has still not exceeded the fault threshold and the alarm thresholds have again been undershot, the fault can be acknowledged.

Dependency:
Refer to: p0604, p0605
Refer to: F07011, A07910
### Parameter List

**Parameter**

**List of parameters**

**Note:**
With p0606 = 0 s, the timer is de-activated and only the fault threshold is effective.

KTY sensor: When setting the minimum value, the timer is disabled and a fault is not output until p0605 is exceeded.

PTC sensor, bimetallic NC contact: The timer minimum value has no special significance.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Access level</th>
<th>Units group</th>
<th>Expert list</th>
<th>Bit field</th>
<th>Dependency</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>p0607[0...n]</strong></td>
<td>Temperature sensor fault timer / Sensor fault time</td>
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<td>Can be changed: C2(3), U, T</td>
<td>Calculated: -</td>
<td>Dynamic index: MDS, p0130</td>
<td>Func. diagram: -</td>
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<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<td>0.000 [s]</td>
<td>600.000 [s]</td>
<td>0.100 [s]</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td><strong>p0611[0...n]</strong></td>
<td>I2t motor model thermal time constant / I2t mot_mod T</td>
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<td>1</td>
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<td>-</td>
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<td>Can be changed: C2(3), U, T</td>
<td>Calculated: -</td>
<td>Dynamic index: MDS, p0130</td>
<td>Func. diagram: 8017</td>
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<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
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<td>-</td>
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<td>0 [s]</td>
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<td><strong>p0612[0...n]</strong></td>
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<td>Can be changed: U, T</td>
<td>Calculated: -</td>
<td>Dynamic index: MDS, p0130</td>
<td>Func. diagram: 8017</td>
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<td>Unit selection: -</td>
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<tr>
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<td>Max</td>
<td>Factory setting</td>
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<td><strong>0 signal</strong></td>
<td><strong>FP</strong></td>
<td><strong>Dependency:</strong></td>
<td><strong>Refer to:</strong></td>
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<td>00</td>
<td>Activate I2t motor model</td>
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<td>No</td>
<td>-</td>
<td>-</td>
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<tr>
<td>01</td>
<td>Activate motor temperature model</td>
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<td>No</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

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SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3

1-135
Note:
Re bit 00:
This bit is only used for permanent-magnet synchronous motors (p0300 = 2xx). It is only possible to switch in thermal I2t monitoring with a time constant greater than zero (p0611 > 0).
Re bit 01:
This bit is used to activate/de-activate the thermal motor model for induction motors.

p0615[0...n]
I2t motor model fault threshold / I2t mot_mod thresh

<table>
<thead>
<tr>
<th>Data type</th>
<th>Dynamic index</th>
<th>Units group</th>
<th>Group</th>
<th>Access level</th>
<th>Calculated</th>
<th>Expert list</th>
<th>Func. diagram</th>
<th>p0130</th>
</tr>
</thead>
<tbody>
<tr>
<td>FloatingPoint32</td>
<td>MDS, p0130</td>
<td>21_1</td>
<td>Motor</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>8017</td>
<td></td>
</tr>
</tbody>
</table>

Min Max Factory setting
0.0 [°C] 220.0 [°C] 180.0 [°C]

Description:
Sets the fault threshold for monitoring using the thermal I2t motor model.

Dependency:
The parameter is only used for permanent-magnet synchronous motors (p0300 = 2xx).
Refer to: r0034, p0611, p0612
Refer to: F07011, A07012

Caution:
When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.

p0616[0...n]
Motor overtemperature alarm threshold 1 / Mot temp alarm 1

<table>
<thead>
<tr>
<th>Data type</th>
<th>Dynamic index</th>
<th>Units group</th>
<th>Group</th>
<th>Access level</th>
<th>Calculated</th>
<th>Expert list</th>
<th>Func. diagram</th>
<th>p0130</th>
</tr>
</thead>
<tbody>
<tr>
<td>FloatingPoint32</td>
<td>MDS, p0130</td>
<td>21_1</td>
<td>Motor</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>8016</td>
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</tr>
</tbody>
</table>

Min Max Factory setting
0.0 [°C] 200.0 [°C] 195.0 [°C]

Description:
Sets the alarm threshold 1 for monitoring the motor temperature.

Note:
The alarm threshold is not, as for p0604, coupled to the timer p0606. The hysteresis for canceling the fault is 2 Kelvin.

p0620[0...n]
Thermal adaptation, stator and rotor resistance / Mot therm_adapt R

<table>
<thead>
<tr>
<th>Data type</th>
<th>Dynamic index</th>
<th>Units group</th>
<th>Group</th>
<th>Access level</th>
<th>Calculated</th>
<th>Expert list</th>
<th>Func. diagram</th>
<th>p0130</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integer16</td>
<td>MDS, p0130</td>
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<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Min Max Factory setting
0 2 2

Description:
Sets the thermal adaptation of the stator/primary section resistance and rotor/secondary section resistance according to r0395 and r0396.

Value:
0: No thermal adaptation of stator and rotor resistances
1: Resistances adapted to the temperatures of the thermal model
2: Resistances adapted to the measured stator winding temperature

Note:
For p0620 = 1, the following applies:
The stator resistance is adapted using the temperature in r0035 and the rotor resistance together with the model temperature in r0633.
For p0620 = 2, the following applies:
The stator resistance is adapted using the temperature in r0035. If applicable, the rotor temperature for adapting the rotor resistance is calculated from the stator temperature (r0035) as follows:
theta_R = (r0628 + r0625) / (r0627 + r0625) * r0035
### List of Parameters

#### p0624[0...n] Motor Temperature Offset PT100 / Mot T_offset PT100

- **Description:** Sets the temperature offset for the PT100 measured value. If there is a difference between the motor temperature displayed in r0035 and the actual motor temperature, this offset can be entered in this parameter, thereby compensating for the difference.
- **Dependency:** Refer to: p0600, p0601
- **Note:** The parameter only takes effect with the following settings:
  - Temperature sensor of the power unit detected (p0600 = 11).
  - Sensor type PT100 selected (p0601 = 5).
- **Conversion formula:**
  \[
  \text{Offset in p0624} = \text{Measured resistance in ohms} \times 2.5 \text{ K/Ohm}
  \]
- **Example:**
  - Measured cable resistance = 2 Ohm
  - \(2 \text{ Ohm} \times 2.5 \text{ K/Ohm} = 5.0 \text{ K}\)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>p0624</td>
<td>Motor T_offset PT100</td>
<td>C2(3), U, T</td>
<td>-</td>
<td>3</td>
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<td></td>
<td></td>
<td>Data type:</td>
<td>Dynamic index:</td>
<td>Func. diagram:</td>
</tr>
<tr>
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<td></td>
<td>FloatingPoint32</td>
<td>MDS, p0130</td>
<td>8016</td>
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<td></td>
<td></td>
<td>P-Group:</td>
<td>Units group:</td>
<td>Unit selection:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Motor</td>
<td>21_2</td>
<td>p0505</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Not for motor type:</td>
<td>Scaling:</td>
<td>Expert list:</td>
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<tr>
<td></td>
<td></td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-100.0 [K]</td>
<td>100.0 [K]</td>
<td>0.0 [K]</td>
</tr>
</tbody>
</table>

#### p0625[0...n] Motor ambient temperature / Mot T_ambient

- **Description:** Defines the ambient temperature of the motor for calculating the motor temperature model.
- **Dependency:** The parameters for stator and rotor resistance (p0350, p0354) refer to this temperature. If the thermal I2t motor model is activated for permanent-magnet synchronous motors (refer to p0611), p0625 is included in the model calculation if a temperature sensor is not being used (see p0601).
- **Note:** The parameters for stator and rotor resistance (p0350, p0354) refer to this temperature. If the thermal I2t motor model is activated for permanent-magnet synchronous motors (refer to p0611), p0625 is included in the model calculation if a temperature sensor is not being used (see p0601).

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>p0625</td>
<td>Motor T_ambient</td>
<td>C2(3), U, T</td>
<td>CALC_MOD_EQU</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Data type:</td>
<td>Dynamic index:</td>
<td>Func. diagram:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FloatingPoint32</td>
<td>MDS, p0130</td>
<td>8016</td>
</tr>
<tr>
<td></td>
<td></td>
<td>P-Group:</td>
<td>Units group:</td>
<td>Unit selection:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Motor</td>
<td>21_1</td>
<td>p0505</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Not for motor type:</td>
<td>Scaling:</td>
<td>Expert list:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-40 [°C]</td>
<td>80 [°C]</td>
<td>20 [°C]</td>
</tr>
</tbody>
</table>

#### p0626[0...n] Motor overtemperature, stator core / Mot T_over core

- **Description:** Defines the rated overtemperature of the stator core referred to the ambient temperature.
- **Dependency:** For 1LA5 and 1LA7 motors (refer to p0300), the parameter is pre-set as a function of p0307 and p0311. Refer to: p0625
- **Note:** When quick commissioning is exited with p3900 > 0, then the parameter is reset if a catalog motor has not been selected (refer to p0300).

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>p0626</td>
<td>Motor T_over core</td>
<td>C2(3), U, T</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Data type:</td>
<td>Dynamic index:</td>
<td>Func. diagram:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FloatingPoint32</td>
<td>MDS, p0130</td>
<td>8016</td>
</tr>
<tr>
<td></td>
<td></td>
<td>P-Group:</td>
<td>Units group:</td>
<td>Unit selection:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PEM, REL, FEM</td>
<td>21_2</td>
<td>p0505</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Not for motor type:</td>
<td>Scaling:</td>
<td>Expert list:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PEM, REL, FEM</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
</tr>
</tbody>
</table>
### Parameter List of parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p0627[0...n]</td>
<td>Motor overtemperature, stator winding / Mot T_over stator</td>
<td>Defined the rated overtemperature of the stator winding referred to the ambient temperature.</td>
<td>For 1LA5 and 1LA7 motors (refer to p0300), the parameter is pre-set as a function of p0307 and p0311. Refer to: p0625</td>
</tr>
<tr>
<td>p0628[0...n]</td>
<td>Motor overtemperature rotor winding / Mot T_over rotor</td>
<td>Defined the rated overtemperature of the squirrel cage rotor referred to ambient temperature.</td>
<td>For 1LA5 and 1LA7 motors (refer to p0300), the parameter is pre-set as a function of p0307 and p0311. Refer to: p0625</td>
</tr>
<tr>
<td>r0630[0...n]</td>
<td>Motor temperature model ambient temperature / MotTMod T_amb.</td>
<td>Displays the ambient temperature of the motor temperature model.</td>
<td></td>
</tr>
<tr>
<td>r0631[0...n]</td>
<td>Motor temperature model, stator core temperature / MotTMod T_core</td>
<td>Displays the stator core temperature of the motor temperature model.</td>
<td></td>
</tr>
<tr>
<td>r0632[0...n]</td>
<td>Motor temperature model, stator winding temperature / MotTMod T_copper</td>
<td>Displays the stator winding temperature of the motor temperature model.</td>
<td></td>
</tr>
</tbody>
</table>
**Parameter**

### List of parameters

#### r0633[0...n]
**Motor temperature model, rotor temperature / MotTMod T_rotor**
- **Can be changed:** -
- **Data type:** FloatingPoint32
- **P-Group:** Motor
- **Not for motor type:** PEM, REL, FEM
- **Min:** - [°C]
- **Max:** - [°C]
- **Description:** Displays the rotor temperature of the motor temperature model.

#### p0640[0...n]
**Current limit / Current limit**
- **Can be changed:** C2(1, 3), U, T
- **Data type:** FloatingPoint32
- **P-Group:** Motor
- **Not for motor type:** -
- **Min:** 0.00 [Arms]
- **Max:** 10000.00 [Arms]
- **Description:** Sets the current limit.
- **Dependency:** Refer to: r0209, p0323
- **Note:**
  - The parameter is part of the quick commissioning (p0010 = 1); this means that it is appropriately pre-assigned when changing r0305, p0323 and p0338.
  - The current limit p0640 is limited to r0209 and p0323. The limit to p0323 is not realized if a value of zero is entered there.
  - The resulting current limit is displayed in r0067 and if required, r0067 is reduced by the thermal model of the Motor Module.
  - The torque and power limits (p1520, p1521, p1530, p1531) matching the current limit are automatically calculated when exiting the quick commissioning using p3900 > 0 or using the automatic parameterization with p0340 = 3, 5.
  - For VECTOR the following applies (p0107):
    - p0640 is limited to 4.0 x p0305.
    - p0640 is pre-assigned for the automatic self commissioning routine (e.g. to 1.5 x p0305, with p0305 = r0207[1]).
    - p0640 must be entered when commissioning the system. This is the reason that p0640 is not calculated by the automatic parameterization when exiting the quick commissioning (p3900 > 0).
    - For SERVO the following applies (p0107):
      - p0640 is pre-assigned as follows using the automatic parameterization (p0340 = 1, p3900 > 0) taking into account the limits r0209 and r0323:
        - for induction motors: p0640 = 1.5 x p0305
        - for synchronous motors: p0640 = p0338

#### p0642[0...n]
**Encoderless operation current reduction / Encoderl op I_red**
- **Can be changed:** C2(1, 3), U, T
- **Data type:** FloatingPoint32
- **P-Group:** Motor
- **Not for motor type:** -
- **Min:** 0.00 [%]
- **Max:** 100.00 [%]
- **Description:** Sets the reduction for the current limit in encoderless operation.
- **Dependency:** Refer to: r0209, p0323, p0491, p0640, p1300, p1404
- **Note:**
  - The value is referred to p0640.
  - If the motor is operated both with encoder as well as without encoder (e.g. p0491 is not equal to 0 or p1404 < p1082) then the maximum current can be reduced in encoderless operation. This reduces disturbing saturation-related motor data changes in encoderless operation.

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SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3
### List of parameters

#### p0643[0...n] Overvoltage protection for synchronous motors / Overvolt_protect

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Dependency</th>
<th>Notice</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p0643</td>
<td>Sets the overvoltage protection for synchronous motors in the field-weakening range.</td>
<td></td>
<td></td>
<td></td>
<td>In the field-weakening range, synchronous motors can, when a fault condition exists, generate high DC link voltages. The following possibilities exist to protect the drive system from being destroyed due to overvoltage: - limit the maximum speed (p1082) without any additional protection. The maximum speed without protection is calculated as follows: p1082 [rpm] = 11.695 * r0297/p0316 [Nm/A] - use a Voltage Protection Module (VPM) in conjunction with the function “Safe Torque Off” (p9601, p9801). When a fault condition exists, the VPM short-circuits the motors. During the short-circuit, the pulses must be suppressed - this means that the terminals for the function “Safe Torque Off” must be connected to the VPM. - activating the internal voltage protection (IVP) with p1231 = 3.</td>
</tr>
</tbody>
</table>

#### p0650[0...n] Actual motor operating hours / Mot t_oper act

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Dependency</th>
<th>Notice</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p0650</td>
<td>Displays the operating hours for the corresponding motor. The motor operating time counter continues to run when the pulses are enabled. When the pulse enable is withdrawn, the counter is held and the value saved.</td>
<td></td>
<td></td>
<td></td>
<td>The motor operating time counter continues to run when the pulses are enabled. When the pulse enable is withdrawn, the counter is held and the value saved.</td>
</tr>
</tbody>
</table>

#### p0651[0...n] Motor operating hours maintenance interval / Mot t_op maint

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Dependency</th>
<th>Notice</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p0651</td>
<td>Sets the service/maintenance intervals in hours for the appropriate motor. An appropriate fault is output when the operating hours set here are reached.</td>
<td></td>
<td></td>
<td></td>
<td>The operating hours counter only runs with motor data set 0 and 1 (MDS).</td>
</tr>
</tbody>
</table>

---

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

**Can be changed:** T  
**Data type:** Integer16  
**Dynamic index:** MDS, p0130  
**P-Group:** Motor  
**Units group:** -  
**Not for motor type:** -  
**Scaling:** -  
**Expert list:** 1  
**Factory setting**

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

**Description:**

**Value:**

- 0: No measure
- 1: Voltage Protection Module (VPM)

**Dependency:**

Refer to: p0316, p1082, p1231, p9601, p9801  
Refer to: F07432, F07906, F07907

**Notice:**

When the speed limiting is removed, the user is responsible for implementing a suitable overvoltage protection.

**Note:**

In the field-weakening range, synchronous motors can, when a fault condition exists, generate high DC link voltages. The following possibilities exist to protect the drive system from being destroyed due to overvoltage:

- limit the maximum speed (p1082) without any additional protection. The maximum speed without protection is calculated as follows: p1082 [rpm] = 11.695 * r0297/p0316 [Nm/A]
- use a Voltage Protection Module (VPM) in conjunction with the function “Safe Torque Off” (p9601, p9801). When a fault condition exists, the VPM short-circuits the motors. During the short-circuit, the pulses must be suppressed - this means that the terminals for the function “Safe Torque Off” must be connected to the VPM.
- activating the internal voltage protection (IVP) with p1231 = 3.

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

**Can be changed:** T  
**Data type:** Unsigned32  
**Dynamic index:** MDS, p0130  
**P-Group:** Motor  
**Units group:** -  
**Not for motor type:** -  
**Scaling:** -  
**Expert list:** 1  
**Factory setting**

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0 [h]</td>
<td>4294967295 [h]</td>
<td>0 [h]</td>
</tr>
</tbody>
</table>

**Description:**

Displays the operating hours for the corresponding motor.

The motor operating time counter continues to run when the pulses are enabled. When the pulse enable is withdrawn, the counter is held and the value saved.

**Dependency:**

Refer to: p0651  
Refer to: A01590

**Note:**

The operating hours counter in p0650 can only be reset to 0. In this case, p0651 is automatically set to 0. For p0651 = 0, the operating hours counter is disabled. The operating hours counter only runs with motor data set 0 and 1 (MDS).

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

**Can be changed:** T  
**Data type:** Unsigned32  
**Dynamic index:** MDS, p0130  
**P-Group:** Motor  
**Units group:** -  
**Not for motor type:** -  
**Scaling:** -  
**Expert list:** 1  
**Factory setting**

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0 [h]</td>
<td>150000 [h]</td>
<td>0 [h]</td>
</tr>
</tbody>
</table>
### p0680[0...7]

**Central measuring probe, input terminal / Cen meas inp**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>p0680[0]</td>
<td>0</td>
<td>No measuring probe</td>
<td>p0488, p0489, p0493, p0494, p0495, p0580, p2517, p2518</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>DI/DO 9 (X132.2)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>DI/DO 10 (X132.3)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>DI/DO 11 (X132.4)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>DI/DO 8 (X132.1)</td>
<td></td>
</tr>
</tbody>
</table>

**Note:**
DI/DO: Bidirectional Digital Input/Output
Prerequisite: The DI/DO must be set as input (p0728.x = 0).
If a parameter change is rejected, a check should be performed as to whether the input terminal is already being used in p0488, p0489, p0493, p0494, p0495, p0580, p2517 or p2518.

### p0681

**BI: Central measuring probe, synchronizing signal signal source / Cen meas sync_sig**

**Description:**
Sets the signal source for the synchronizing signal (SYN) of the function "central measuring probe evaluation".

**Notice:**
The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

### p0682

**CI: Central measuring probe, control word signal source / Cen meas STW S_src**

**Description:**
Sets the signal source for the control word of the function "central measuring probe evaluation".

### p0684

**Central measuring probe evaluation technique / Cen meas eval_tech**

**Description:**
Sets the evaluation technique for the "central measuring probe evaluation" function.
**Parameter**

**List of parameters**

**Value:**
- 0: Measurement with handshake
- 1: Measurement without handshake

**Note:**
During measurement without a handshake, the probe may have a higher evaluation frequency.

The setting "Measurement without handshake" must be supported by the higher-level control. This setting cannot be used for SIMOTION D with integrated SINAMICS or with CX32.

**r0685**
Central measuring probe, control word display / Cen meas STW disp

<table>
<thead>
<tr>
<th>CU_S110-CAN, CU_S110-DP, CU_S110-PN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed:  -</td>
</tr>
<tr>
<td>Data type: Unsigned16</td>
</tr>
<tr>
<td>P-Group: Commands</td>
</tr>
<tr>
<td>Not for motor type: -</td>
</tr>
</tbody>
</table>

**Description:**
Displays the control word for the function "central measuring probe evaluation".

**Bit field:**

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Falling edge, measuring probe 1</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>01</td>
<td>Falling edge, measuring probe 2</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>02</td>
<td>Falling edge, measuring probe 3</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>03</td>
<td>Falling edge, measuring probe 4</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>04</td>
<td>Falling edge, measuring probe 5</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>05</td>
<td>Falling edge, measuring probe 6</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>06</td>
<td>Falling edge, measuring probe 7</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>07</td>
<td>Falling edge, measuring probe 8</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>08</td>
<td>Rising edge, measuring probe 1</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>09</td>
<td>Rising edge, measuring probe 2</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>10</td>
<td>Rising edge, measuring probe 3</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>11</td>
<td>Rising edge, measuring probe 4</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>12</td>
<td>Rising edge, measuring probe 5</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>13</td>
<td>Rising edge, measuring probe 6</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>14</td>
<td>Rising edge, measuring probe 7</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>15</td>
<td>Rising edge, measuring probe 8</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
</tbody>
</table>

**r0686[0...7]**
CO: Central measuring probe, measuring time rising edge / CenMeas t meas 0/1

<table>
<thead>
<tr>
<th>CU_S110-CAN, CU_S110-DP, CU_S110-PN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed:  -</td>
</tr>
<tr>
<td>Data type: Unsigned16</td>
</tr>
<tr>
<td>P-Group: Displays, signals</td>
</tr>
<tr>
<td>Not for motor type: -</td>
</tr>
</tbody>
</table>

**Description:**
Displays the measuring time for a rising edge at the digital input for the "central measuring probe evaluation" function.

The measuring time is specified as 16-bit value with a resolution of 0.25 µs.

r0686[0]: Measuring time, rising edge measuring probe 1
r0686[1]: Measuring time, rising edge measuring probe 2
r0686[2]: Measuring time, rising edge measuring probe 3
r0686[3]: Measuring time, rising edge measuring probe 4
r0686[4]: Measuring time, rising edge measuring probe 5
r0686[5]: Measuring time, rising edge measuring probe 6
r0686[6]: Measuring time, rising edge measuring probe 7
r0686[7]: Measuring time, rising edge measuring probe 8
## List of parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>r0687[0...7]</td>
<td>Displays the measuring time for a falling edge at the digital input for the &quot;central measuring probe evaluation&quot; function. The measuring time is specified as 16-bit value with a resolution of 0.25 µs.</td>
<td>-</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>r0688</td>
<td>Displays the status word for the function &quot;central measuring probe evaluation&quot;.</td>
<td>-</td>
<td>-</td>
<td>3</td>
</tr>
</tbody>
</table>

### Bit field:

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Digital input, measuring probe 1</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>01</td>
<td>Digital input, measuring probe 2</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>02</td>
<td>Digital input, measuring probe 3</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>03</td>
<td>Digital input, measuring probe 4</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>04</td>
<td>Digital input, measuring probe 5</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>05</td>
<td>Digital input, measuring probe 6</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>06</td>
<td>Digital input, measuring probe 7</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>07</td>
<td>Digital input, measuring probe 8</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>08</td>
<td>Sub-sampling, measuring probe 1</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>09</td>
<td>Sub-sampling, measuring probe 2</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>10</td>
<td>Sub-sampling, measuring probe 3</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>11</td>
<td>Sub-sampling, measuring probe 4</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>12</td>
<td>Sub-sampling, measuring probe 5</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>13</td>
<td>Sub-sampling, measuring probe 6</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>14</td>
<td>Sub-sampling, measuring probe 7</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>15</td>
<td>Sub-sampling, measuring probe 8</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
</tbody>
</table>
### r0721

- **CU digital inputs, terminal actual value / CU DI actual value**

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>DI 0 (X133.1)</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>01</td>
<td>DI 1 (X133.2)</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>02</td>
<td>DI 2 (X133.3)</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>03</td>
<td>DI 3 (X133.4)</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>08</td>
<td>DI/DO 8 (X132.1)</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>09</td>
<td>DI/DO 9 (X132.2)</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>10</td>
<td>DI/DO 10 (X132.3)</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>11</td>
<td>DI/DO 11 (X132.4)</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>16</td>
<td>DI 16 (X130.1)</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>17</td>
<td>DI 17 (X130.2)</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>18</td>
<td>DI 18 (X130.4)</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>19</td>
<td>DI 19 (X130.5)</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>20</td>
<td>DI 20 (X131.1)</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>21</td>
<td>DI 21 (X131.2)</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>22</td>
<td>DI 22 (X131.4)</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
</tbody>
</table>

**Note:**
- If a DI/DO is parameterized as output (p0728.x = 1), then r0721.x = 0 is displayed.

- DI: Digital Input
- DI/DO: Bidirectional Digital Input/Output

### r0722.0...22

- **CO/BO: CU digital inputs, status / CU DI status**

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>DI 0 (X133.1)</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>01</td>
<td>DI 1 (X133.2)</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>02</td>
<td>DI 2 (X133.3)</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>03</td>
<td>DI 3 (X133.4)</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>08</td>
<td>DI/DO 8 (X132.1)</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>09</td>
<td>DI/DO 9 (X132.2)</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>10</td>
<td>DI/DO 10 (X132.3)</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>11</td>
<td>DI/DO 11 (X132.4)</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>16</td>
<td>DI 16 (X130.1)</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>17</td>
<td>DI 17 (X130.2)</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>18</td>
<td>DI 18 (X130.4)</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>19</td>
<td>DI 19 (X130.5)</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>20</td>
<td>DI 20 (X131.1)</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
</tbody>
</table>

**Note:**
- If a DI/DO is parameterized as output (p0728.x = 1), then r0721.x = 0 is displayed.

- DI: Digital Input
- DI/DO: Bidirectional Digital Input/Output
### List of parameters

#### Parameter 21 DI 21 (X131.2)
- High: 2
- Low: 1

#### Parameter 22 DI 22 (X131.4)
- High: 2
- Low: 1

### Dependency:
Refer to: r0723

### Notice:
To the terminal designation:
The first designation is valid for CU320, the second for CU310.

### Note:
- DI: Digital Input
- DI/DO: Bidirectional Digital Input/Output

#### r0723.0...22 CO/BO: CU digital inputs, status inverted / CU DI status inv

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DI 0 (X133.1)</td>
<td>High</td>
<td>Displays the inverted status of the digital inputs.</td>
</tr>
<tr>
<td>DI 1 (X133.2)</td>
<td>High</td>
<td></td>
</tr>
<tr>
<td>DI 2 (X133.3)</td>
<td>High</td>
<td></td>
</tr>
<tr>
<td>DI 3 (X133.4)</td>
<td>High</td>
<td></td>
</tr>
<tr>
<td>DI/DO 8 (X132.1)</td>
<td>High</td>
<td></td>
</tr>
<tr>
<td>DI/DO 9 (X132.2)</td>
<td>High</td>
<td></td>
</tr>
<tr>
<td>DI/DO 10 (X132.3)</td>
<td>High</td>
<td></td>
</tr>
<tr>
<td>DI/DO 11 (X132.4)</td>
<td>High</td>
<td></td>
</tr>
<tr>
<td>DI 16 (X130.1)</td>
<td>High</td>
<td></td>
</tr>
<tr>
<td>DI 17 (X130.2)</td>
<td>High</td>
<td></td>
</tr>
<tr>
<td>DI 18 (X130.3)</td>
<td>High</td>
<td></td>
</tr>
<tr>
<td>DI 19 (X130.5)</td>
<td>High</td>
<td></td>
</tr>
<tr>
<td>DI 20 (X131.1)</td>
<td>High</td>
<td></td>
</tr>
<tr>
<td>DI 21 (X131.2)</td>
<td>High</td>
<td></td>
</tr>
<tr>
<td>DI 22 (X131.4)</td>
<td>High</td>
<td></td>
</tr>
</tbody>
</table>

### Dependency:
Refer to: r0723

### Notice:
To the terminal designation:
The first designation is valid for CU320, the second for CU310.

### Note:
- DI/DO: Bidirectional Digital Input/Output

#### p0728 CU, set input or output / CU DI or DO

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DI/DO 8 (X132.1)</td>
<td>Output</td>
<td>Sets the bidirectional digital inputs/outputs as an input or output.</td>
</tr>
<tr>
<td>DI/DO 9 (X132.2)</td>
<td>Output</td>
<td></td>
</tr>
<tr>
<td>DI/DO 10 (X132.3)</td>
<td>Output</td>
<td></td>
</tr>
<tr>
<td>DI/DO 11 (X132.4)</td>
<td>Output</td>
<td></td>
</tr>
</tbody>
</table>

### Dependency:
Refer to: r0722

### Notice:
To the terminal designation:
The first designation is valid for CU320, the second for CU310.

### Note:
- DI/DO: Bidirectional Digital Input/Output
Parameter

List of parameters

r0729  
CU digital outputs access authority / CU DO acc_auth

- Can be changed: -
- Calculated: -
- Access level: 1

CU_S110-CAN, CU_S110-DP, CU_S110-PN

- Data type: Unsigned32
- Dynamic index: -
- Func. diagram: 2030, 2031

- P-Group: Commands
- Units group: -
- Unit selection: -

- Not for motor type: -
- Scaling: -
- Expert list: 1

- Min
- Max
- Factory setting

- Bit field: Bit Signal name 1 signal 0 signal FP
  08 DI/DO 8 (X132.1) High Low -
  09 DI/DO 9 (X132.2) High Low -
  10 DI/DO 10 (X132.3) High Low -
  11 DI/DO 11 (X132.4) High Low -
  16 DO 16 (X131.5) High Low -

Description: Displays the access authority at the digital outputs.

- Bit = 1:
The control has access authority to the digital output via PROFIBUS or direct access.

- Bit = 0:
The drive has access authority to the digital output or the digital input/output is not set as digital output or is not available.

Dependency:
- Refer to: p0728, p0738, p0739, p0740, p0741, r0747, p0748

Note:
- The DI/DO must be connected as output (p0728).
- DI/DO: Bidirectional Digital Input/Output

p0738  
BI: CU, signal source for terminal DI/DO 8 / CU S_src DI/DO 8

- Can be changed: U, T
- Calculated: -
- Access level: 1

CU_S110-CAN, CU_S110-DP, CU_S110-PN

- Data type: Unsigned32 / Binary
- Dynamic index: -
- Func. diagram: 1510, 2030

- P-Group: Commands
- Units group: -
- Unit selection: -

- Not for motor type: -
- Scaling: -
- Expert list: 1

- Min
- Max
- Factory setting

- Data type:
- Unsigned32 / Binary
- Dynamic index:
- Func. diagram: 1510, 2030, 2130, 2497, 2498

- P-Group:
- Commands
- Units group:
- Unit selection:

- Not for motor type:
- Scaling:
- Expert list:

- Min
- Max
- Factory setting

Dependency:
- Refer to: p0728, p0738, p0739, p0740, p0741, r0747, p0748

Description:
- Sets the signal source for terminal DI/DO 8 (X132.1).

Notice:
The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

Note:
- Prerequisite: The DI/DO must be set as an output (p0728.8 = 1).
- DI/DO: Bidirectional Digital Input/Output

p0739  
BI: CU, signal source for terminal DI/DO 9 / CU S_src DI/DO 9

- Can be changed: U, T
- Calculated: -
- Access level: 1

CU_S110-CAN, CU_S110-DP, CU_S110-PN

- Data type: Unsigned32 / Binary
- Dynamic index: -
- Func. diagram: 1510, 2030, 2130, 2497, 2498

- P-Group: Commands
- Units group: -
- Unit selection: -

- Not for motor type: -
- Scaling: -
- Expert list: 1

- Min
- Max
- Factory setting

- Data type:
- Unsigned32 / Binary
- Dynamic index:
- Func. diagram: 1510, 2030, 2130, 2497, 2498

- P-Group:
- Commands
- Units group:
- Unit selection:

- Not for motor type:
- Scaling:
- Expert list:

- Min
- Max
- Factory setting

Description:
- Sets the signal source for terminal DI/DO 9 (X132.2).

Notice:
The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

Note:
- Prerequisite: The DI/DO must be set as an output (p0728.9 = 1).
- DI/DO: Bidirectional Digital Input/Output
**Parameter**

**List of parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Notice</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p0740</td>
<td>BI: CU, signal source for terminal DI/DO 10 / CU S_src DI/DO 10</td>
<td>Sets the signal source for terminal DI/DO 10 (X132.3).</td>
<td>The parameter may be protected as a result of p0922 or p2079 and cannot be changed.</td>
</tr>
<tr>
<td></td>
<td>Prerequisite: The DI/DO must be set as an output (p0728.10 = 1).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>p0741</td>
<td>BI: CU, signal source for terminal DI/DO 11 / CU S_src DI/DO 11</td>
<td>Sets the signal source for terminal DI/DO 11 (X132.4).</td>
<td>The parameter may be protected as a result of p0922 or p2079 and cannot be changed.</td>
</tr>
<tr>
<td></td>
<td>Prerequisite: The DI/DO must be set as an output (p0728.11 = 1).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>p0746</td>
<td>BI: CU signal source for terminal DO 16 / CU S_src DO 16</td>
<td>Sets the signal source for terminal DO 16.</td>
<td>The parameter may be protected as a result of p0922 or p2079 and cannot be changed.</td>
</tr>
<tr>
<td></td>
<td>Terminal DO 16 is used for Safety Extended Functions if these have been enabled using p9601 and are not controlled via PROFiSafe, and provided that a signal source has been set for the F-DO using p10042.</td>
<td></td>
<td>The signal source entered in p0746 is then no longer output at terminal DO 16.</td>
</tr>
<tr>
<td></td>
<td>Prerequisite: The DI/DO must be set as an output (p0728.11 = 1).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>r0747</td>
<td>CU, digital outputs status / CU DO status</td>
<td>Displays the status of digital outputs.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>p0740</td>
<td>U, T</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>p0741</td>
<td>U, T</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>p0746</td>
<td>U, T</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>r0747</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Data type:</th>
<th>Dynamic index:</th>
<th>Func. diagram:</th>
</tr>
</thead>
<tbody>
<tr>
<td>p0740</td>
<td>Unsigned32 / Binary</td>
<td>-</td>
<td>1510, 2031, 2497, 2498</td>
</tr>
<tr>
<td>p0741</td>
<td>Unsigned32 / Binary</td>
<td>-</td>
<td>1510, 2031, 2497, 2498</td>
</tr>
<tr>
<td>p0746</td>
<td>Unsigned32</td>
<td>-</td>
<td>1510, 2032</td>
</tr>
<tr>
<td>r0747</td>
<td>Unsigned32</td>
<td>-</td>
<td>2130, 2131, 2132, 2133</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units group:</th>
<th>Scaling:</th>
<th>Expert list:</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p0740</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>p0741</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>p0746</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>r0747</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
### Bit field: Bit Signal name 1 signal 0 signal FP
| 08 | DI/DO 8 (X132.1) | High | Low |
| 09 | DI/DO 9 (X132.2) | High | Low |
| 10 | DI/DO 10 (X132.3) | High | Low |
| 11 | DI/DO 11 (X132.4) | High | Low |
| 16 | DO 16 (X131.5) | High | Low |

#### Notice:
Terminal DO 16 is used for Safety Extended Functions as soon as this is enabled using p9601 and assuming that it is not controlled via PROFIsafe.

The signal source set in p0746 is then no longer output at terminal DO 16.

#### Note:
Inversion using p0748 has been taken into account.

#### p0748 CU, invert digital outputs / CU DO inv

- **CU_S110-CAN, CU_S110-DP, CU_S110-PN**
- **Can be changed:** U, T
- **Data type:** Unsigned32
- **P-Group:** Commands
- **Not for motor type:** -
- **Min:** Max

#### Description:
Setting to invert the signals at the digital outputs.

#### Bit field: Bit Signal name 1 signal 0 signal FP
| 08 | DI/DO 8 (X132.1) | Inverted | Not inverted | 2030 |
| 09 | DI/DO 9 (X132.2) | Inverted | Not inverted | 2030 |
| 10 | DI/DO 10 (X132.3) | Inverted | Not inverted | 2031 |
| 11 | DI/DO 11 (X132.4) | Inverted | Not inverted | 2031 |
| 16 | DO 16 (X131.5) | Inverted | Not inverted | 2032 |

#### Notice:
If telegram 39x is set via p0922 in SINAMICS Integrated, the inversion of the output has no effect.

#### p0752 CO: CU analog input, input voltage actual / CU AI U_input act

- **CU_S110-CAN, CU_S110-DP, CU_S110-PN**
- **Can be changed:** -
- **Data type:** FloatingPoint32
- **P-Group:** Terminals

#### Description:
Displays the actual input voltage at the analog input.

#### Min Max Factory setting
- - 0000 0000 0000 0000 0000

#### p0753 CU analog input smoothing time constant / CU AI T_smooth

- **CU_S110-CAN, CU_S110-DP, CU_S110-PN**
- **Can be changed:** U, T
- **Data type:** FloatingPoint32
- **P-Group:** Terminals

#### Description:
Sets the smoothing time constant of the 1st-order low pass filter for the analog input.

#### Min Max Factory setting
0.0 [ms] 1000.0 [ms] 0.0 [ms]
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>r0755</strong></td>
<td>CO: CU analog input actual value in percent / CU AI value in %</td>
</tr>
<tr>
<td>CU_S110-CAN, CU_S110-DP, CU_S110-PN</td>
<td>Can be changed: - Calculated: - Access level: 1</td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td>Dynamic index: -</td>
</tr>
<tr>
<td>P-Group: Terminals</td>
<td>Units group: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: PERCENT</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td>- [%]</td>
<td>- [%]</td>
</tr>
<tr>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td><strong>p0756</strong></td>
<td>CU analog input type / CU AI type</td>
</tr>
<tr>
<td>CU_S110-CAN, CU_S110-DP, CU_S110-PN</td>
<td>Can be changed: U, T Calculated: - Access level: 1</td>
</tr>
<tr>
<td>Data type: Integer16</td>
<td>Dynamic index: -</td>
</tr>
<tr>
<td>P-Group: Terminals</td>
<td>Units group: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td><strong>p0757</strong></td>
<td>CU analog input characteristic value x1 / CU AI char x1</td>
</tr>
<tr>
<td>CU_S110-CAN, CU_S110-DP, CU_S110-PN</td>
<td>Can be changed: U, T Calculated: - Access level: 2</td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td>Dynamic index: -</td>
</tr>
<tr>
<td>P-Group: Terminals</td>
<td>Units group: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td>-11.000 [V]</td>
<td>11.000 [V]</td>
</tr>
<tr>
<td>0.000 [V]</td>
<td></td>
</tr>
<tr>
<td><strong>p0758</strong></td>
<td>CU analog input characteristic value y1 / CU AI char y1</td>
</tr>
<tr>
<td>CU_S110-CAN, CU_S110-DP, CU_S110-PN</td>
<td>Can be changed: U, T Calculated: - Access level: 2</td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td>Dynamic index: -</td>
</tr>
<tr>
<td>P-Group: Terminals</td>
<td>Units group: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td>-1000.00 [%]</td>
<td>1000.00 [%]</td>
</tr>
<tr>
<td>0.00 [%]</td>
<td></td>
</tr>
</tbody>
</table>

**Note:**
- **AI: Analog Input**
- The parameters for the characteristic do not have a limiting effect.
- The scaling characteristic for the analog input is defined using 2 points.
- This parameter specifies the y coordinate (percentage) of the 1st value pair of the characteristic.

**Description:**
- Displays the currently referred input value of the analog input.
- When interconnected, the signals are referred to the reference quantities p200x and p205x.

**Value:**
- 0: Unipolar voltage input (0 V ... +10 V)
- 4: Bipolar voltage input (-10 V ... +10 V)
**p0759  CU analog input characteristic value x2 / CU AI char x2**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CU_S110-CAN, CU_S110-DP, CU_S110-PN</strong></td>
<td>Can be changed: U, T</td>
</tr>
<tr>
<td><strong>Data type:</strong> FloatingPoint32</td>
<td>Calculated: -</td>
</tr>
<tr>
<td><strong>P-Group:</strong> Terminals</td>
<td>Dynamic index: -</td>
</tr>
<tr>
<td><strong>Not for motor type:</strong></td>
<td>Units group: -</td>
</tr>
<tr>
<td><strong>Min</strong></td>
<td>Scaling: -</td>
</tr>
<tr>
<td>-11.000 [V]</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td><strong>Max</strong></td>
<td>Factory setting</td>
</tr>
<tr>
<td>11.000 [V]</td>
<td>10.000 [V]</td>
</tr>
</tbody>
</table>

**Description:**
Sets the scaling characteristic for the analog input.

The scaling characteristic for the analog input is defined using 2 points.

This parameter specifies the x coordinate (input voltage in V) of the 2nd value pair of the characteristic.

**Note:**
The parameters for the characteristic do not have a limiting effect.

**p0760  CU analog input characteristic value y2 / CU AI char y2**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CU_S110-CAN, CU_S110-DP, CU_S110-PN</strong></td>
<td>Can be changed: U, T</td>
</tr>
<tr>
<td><strong>Data type:</strong> FloatingPoint32</td>
<td>Calculated: -</td>
</tr>
<tr>
<td><strong>P-Group:</strong> Terminals</td>
<td>Dynamic index: -</td>
</tr>
<tr>
<td><strong>Not for motor type:</strong></td>
<td>Units group: -</td>
</tr>
<tr>
<td><strong>Min</strong></td>
<td>Scaling: -</td>
</tr>
<tr>
<td>-1000.00 [%]</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td><strong>Max</strong></td>
<td>Factory setting</td>
</tr>
<tr>
<td>1000.00 [%]</td>
<td>100.00 [%]</td>
</tr>
</tbody>
</table>

**Description:**
Sets the scaling characteristic for the analog input.

The scaling characteristic for the analog input is defined using 2 points.

This parameter specifies the y coordinate (percentage) of the 2nd value pair of the characteristic.

**Note:**
The parameters for the characteristic do not have a limiting effect.

**p0763  CU analog input offset / CU AI offset**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CU_S110-CAN, CU_S110-DP, CU_S110-PN</strong></td>
<td>Can be changed: U, T</td>
</tr>
<tr>
<td><strong>Data type:</strong> FloatingPoint32</td>
<td>Calculated: -</td>
</tr>
<tr>
<td><strong>P-Group:</strong> Terminals</td>
<td>Dynamic index: -</td>
</tr>
<tr>
<td><strong>Not for motor type:</strong></td>
<td>Units group: -</td>
</tr>
<tr>
<td><strong>Min</strong></td>
<td>Scaling: -</td>
</tr>
<tr>
<td>-20.000 [V]</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td><strong>Max</strong></td>
<td>Factory setting</td>
</tr>
<tr>
<td>20.000 [V]</td>
<td>0.000 [V]</td>
</tr>
</tbody>
</table>

**Description:**
Sets the offset for the analog input.

The offset is added to the input signal before the scaling characteristic.

**p0766  CU analog input activate absolute value generation / CU AI absVal act**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CU_S110-CAN, CU_S110-DP, CU_S110-PN</strong></td>
<td>Can be changed: U, T</td>
</tr>
<tr>
<td><strong>Data type:</strong> Integer16</td>
<td>Calculated: -</td>
</tr>
<tr>
<td><strong>P-Group:</strong> Terminals</td>
<td>Dynamic index: -</td>
</tr>
<tr>
<td><strong>Not for motor type:</strong></td>
<td>Units group: -</td>
</tr>
<tr>
<td><strong>Min</strong></td>
<td>Scaling: -</td>
</tr>
<tr>
<td>0</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td><strong>Max</strong></td>
<td>Factory setting</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

**Description:**
Activates the absolute value generation of the analog input signal.

**Value:**
0: No absolute value generation
1: Absolute value generation switched in
### List of parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>p0767</td>
<td>BI: CU analog input signal source for inversion / CU AI inv S_src</td>
</tr>
<tr>
<td>p0768</td>
<td>CU analog input noise suppression window / CU AI window</td>
</tr>
<tr>
<td>p0769</td>
<td>BI: CU analog input signal source for enable / CU AI enable</td>
</tr>
<tr>
<td>p0771[0...2]</td>
<td>CI: Test sockets signal source / Test skt S_src</td>
</tr>
<tr>
<td>r0772[0...2]</td>
<td>Test sockets output signal / TestSktsSignalVal</td>
</tr>
</tbody>
</table>

**p0767**

<table>
<thead>
<tr>
<th>Value</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>U, T</td>
<td></td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Data type:</th>
<th>Unsigned32</th>
<th>Binary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dynamic index:</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**p0768**

<table>
<thead>
<tr>
<th>Value</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>U, T</td>
<td></td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Data type:</th>
<th>FloatingPoint32</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dynamic index:</td>
<td>-</td>
</tr>
</tbody>
</table>

**p0769**

<table>
<thead>
<tr>
<th>Value</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>U, T</td>
<td></td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Data type:</th>
<th>Unsigned32</th>
<th>Binary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dynamic index:</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**p0771[0...2]**

<table>
<thead>
<tr>
<th>Value</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>U, T</td>
<td></td>
<td></td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Data type:</th>
<th>Unsigned32</th>
<th>Integer16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dynamic index:</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**r0772[0...2]**

<table>
<thead>
<tr>
<th>Value</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>U, T</td>
<td></td>
<td></td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Data type:</th>
<th>FloatingPoint32</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dynamic index:</td>
<td>-</td>
</tr>
</tbody>
</table>

**Description:**

- **AI: Analog Input**
- **Changes less than the window are suppressed.**
- **Sets the signal source to invert the analog input signal.**
- **Sets the window for noise suppression of the analog input.**
- **Sets the signal source to enable the analog input.**
- **Sets the signal source for the signal to be output at the test sockets.**
- **Displays the actual value of the signal to be output.**

**Index:**

- 
  
**Dependency:**

- Can only be set when p0776 = 99.

- Refer to: r0772, r0774, p0776, p0777, p0778, p0779, p0780, p0783, p0784, r0786

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SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3
### Test sockets output voltage / TestSkts U_output

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>r0774[0...2]</td>
<td>FloatingPoint32</td>
<td>Displays the actual output voltage for the test sockets.</td>
<td>[0...2]</td>
</tr>
</tbody>
</table>

### Test socket mode / Test skt skt mode

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>p0776[0...2]</td>
<td>Integer16</td>
<td>Sets the mode for the test sockets.</td>
<td>[0...2]</td>
</tr>
</tbody>
</table>

### Test socket characteristic value x1 / Test skt char x1

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Description</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>p0777[0...2]</td>
<td>FloatingPoint32</td>
<td>The scaling characteristic for the test sockets is defined using two points.</td>
<td>[0...2]</td>
</tr>
</tbody>
</table>

### Notes
- The value 0.00 % corresponds to 2.49 V.
**p0778[0...2]**  Test socket characteristic value y1 / Test skt char y1

- **CU_S110-CAN, CU_S110-DP, CU_S110-PN**
- **Can be changed:** U, T
- **Data type:** FloatingPoint32
- **P-Group:** Terminals
- **Not for motor type:** -
- **Min:** 0.00 [V]
- **Max:** 4.98 [V]
- **Factory setting:** 2.49 [V]
- **Index:** [0] = T0
  [1] = T1
  [2] = Reserved
- **Dependency:** Can only be set when p0776 = 99.
- **Refer to:** p0777, p0779, p0780, r0786

**Description:**
The scaling characteristic for the test sockets is defined using two points. This parameter specifies the y coordinate (output voltage) of the first point on the characteristic.

**Note:**
The value 100.00 % corresponds to 4.98 V.

**p0779[0...2]**  Test socket characteristic value x2 / Test skt char x2

- **CU_S110-CAN, CU_S110-DP, CU_S110-PN**
- **Can be changed:** U, T
- **Data type:** FloatingPoint32
- **P-Group:** Terminals
- **Not for motor type:** -
- **Min:** -100000.00 [%]
- **Max:** 427.9E9 [%]
- **Factory setting:** 100.00 [%]
- **Index:** [0] = T0
  [1] = T1
  [2] = Reserved
- **Dependency:** Can only be set when p0776 = 99.
- **Refer to:** p0777, p0779, p0780, r0786

**Description:**
The scaling characteristic for the test sockets is defined using two points. This parameter specifies the x coordinate (percentage) of the second point on the characteristic.

**Note:**
The value 100.00 % corresponds to 4.98 V.

**p0780[0...2]**  Test socket characteristic value y2 / Test skt char y2

- **CU_S110-CAN, CU_S110-DP, CU_S110-PN**
- **Can be changed:** U, T
- **Data type:** FloatingPoint32
- **P-Group:** Terminals
- **Not for motor type:** -
- **Min:** 0.00 [V]
- **Max:** 4.98 [V]
- **Factory setting:** 4.98 [V]
- **Index:** [0] = T0
  [1] = T1
  [2] = Reserved
- **Dependency:** Can only be set when p0776 = 99.
- **Refer to:** p0777, p0779, p0780, r0786

**Description:**
The scaling characteristic for the test sockets is defined using two points. This parameter specifies the y coordinate (output voltage) of the second point on the characteristic.
### List of parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Index</th>
<th>Value</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>p0783[0...2]</strong> Test sockets offset / Test skt offset</td>
<td>Sets an additional offset for the test sockets.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CU_S110-CAN, CU_S110-DP, CU_S110-PN</td>
<td>Can be changed: U, T</td>
<td>Calculated: -</td>
<td>Access level: 2</td>
<td></td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td>Dynamic index: -</td>
<td>Func. diagram: 8134</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P-Group: Terminals</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-4.60 [V]</td>
<td>4.60 [V]</td>
<td>0.00 [V]</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>p0784[0...2]</strong> Test socket limit on/off / TestSktLim on/off</td>
<td>Sets the limit for a signal to be output via test sockets.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CU_S110-CAN, CU_S110-DP, CU_S110-PN</td>
<td>Can be changed: U, T</td>
<td>Calculated: -</td>
<td>Access level: 2</td>
<td></td>
</tr>
<tr>
<td>Data type: Integer16</td>
<td>Dynamic index: -</td>
<td>Func. diagram: 8134</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P-Group: Terminals</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>r0786[0...2]</strong> Test socket scaling per volt / TestSktScale/Volt</td>
<td>Displays the scaling of the signal to be output. A change in the output voltage by 1 volt corresponds to the value in this parameter. The units are determined by the interconnected test signal.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CU_S110-CAN, CU_S110-DP, CU_S110-PN</td>
<td>Can be changed: -</td>
<td>Calculated: -</td>
<td>Access level: 2</td>
<td></td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td>Dynamic index: -</td>
<td>Func. diagram: 8134</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P-Group: Terminals</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Dependency:</strong></td>
<td>Reference to: p0771, r0772, r0774, p0777, p0778, p0779, p0780, p0783, p0784</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Note:</strong></td>
<td>Example: r0786[0] = 1500.0 and the measuring signal is r0063 (CO: Actual speed smoothed [rpm]). A change of 1 V at the output of test socket T0 corresponds to 1500.0 [rpm].</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### p0788[0...2] Test sockets physical address / Test skt PhyAddr

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Index</th>
<th>Dependency</th>
<th>Refer to</th>
</tr>
</thead>
<tbody>
<tr>
<td>p0788</td>
<td>Sets the physical address to output signals via the test sockets.</td>
<td>[0] = T0&lt;br&gt;[1] = T1&lt;br&gt;[2] = Reserved</td>
<td>Changes only become effective if p0776 does not equal 99.</td>
<td>p0789, r0790</td>
</tr>
</tbody>
</table>

#### Details
- **Can be changed:** U, T
- **Data type:** Unsigned32
- **P-Group:** Terminals
- **Not for motor type:** -
- **Min:** 0000 bin
- **Max:** 1111 1111 1111 1111 1111 1111 1111 1111 1111 bin
- **Access level:** 4
- **Func. diagram:** -
- **Unit selection:** -
- **Expert list:** 1
- **Factory setting:** 0000 bin

### p0789[0...2] Test sockets physical address gain / TestSktPhyAddrGain

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Index</th>
<th>Dependency</th>
<th>Refer to</th>
</tr>
</thead>
<tbody>
<tr>
<td>p0789</td>
<td>Sets the gain of a signal output of a physical address via test sockets.</td>
<td>[0] = T0&lt;br&gt;[1] = T1&lt;br&gt;[2] = Reserved</td>
<td>Changes only become effective if p0776 does not equal 99.</td>
<td>p0788</td>
</tr>
</tbody>
</table>

#### Details
- **Can be changed:** U, T
- **Data type:** FloatingPoint32
- **P-Group:** Terminals
- **Not for motor type:** -
- **Min:** -340.28235E36
- **Max:** 340.28235E36
- **Access level:** 4
- **Func. diagram:** -
- **Unit selection:** -
- **Expert list:** 1
- **Factory setting:** 1.00000

### r0790[0...2] Test sockets physical address signal value / TestSktsPhyAddrVal

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Index</th>
<th>Dependency</th>
<th>Refer to</th>
</tr>
</thead>
<tbody>
<tr>
<td>r0790</td>
<td>Displays the actual value of a signal determined via a physical address.</td>
<td>[0] = T0&lt;br&gt;[1] = T1&lt;br&gt;[2] = Reserved</td>
<td>Only effective when p0776 = 97 or p0776 = 96.</td>
<td>p0788</td>
</tr>
</tbody>
</table>

#### Details
- **Can be changed:** -
- **Data type:** Unsigned32
- **P-Group:** Terminals
- **Not for motor type:** -
- **Min:** -
- **Max:** -
- **Access level:** 4
- **Func. diagram:** -
- **Unit selection:** -
- **Expert list:** 1
- **Factory setting:** -
**Parameter**

### List of parameters

#### p0795

**CU digital inputs simulation mode / CU DI simulation**

- **CU_S110-CAN,**
- **CU_S110-DP,**
- **CU_S110-PN**

- **Can be changed:** U, T
- **Calculated:** -
- **Access level:** 2
- **Data type:** Unsigned32
- **Dynamic index:** -
- **Func. diagram:** 1510, 2020, 2030, 2031, 2100, 2120, 2130, 2131, 2132, 2133
- **P-Group:** Commands
- **Units group:** -
- **Scaling:** -
- **Expert list:** 1

**Description:**
Sets the simulation mode for digital inputs.

**Dependency:**
The setpoint for the input signals is specified using p0796.

**Notice:**
If a digital input is used as signal source for the function "STO" (BI: p9620) then it is not permissible to select the simulation mode and this is rejected.

**Note:**
This parameter is not saved when data is backed-up (p0971, p0977).

**DI:** Digital Input

**DI/DO:** Bidirectional Digital Input/Output

**Bit field:**

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>DI 0 (X133.1)</td>
<td>Simulation</td>
<td>Terminal eval.</td>
<td>-</td>
</tr>
<tr>
<td>01</td>
<td>DI 1 (X133.2)</td>
<td>Simulation</td>
<td>Terminal eval.</td>
<td>-</td>
</tr>
<tr>
<td>02</td>
<td>DI 2 (X133.3)</td>
<td>Simulation</td>
<td>Terminal eval.</td>
<td>-</td>
</tr>
<tr>
<td>03</td>
<td>DI 3 (X133.4)</td>
<td>Simulation</td>
<td>Terminal eval.</td>
<td>-</td>
</tr>
<tr>
<td>04</td>
<td>DI/DO 4 (X132.1)</td>
<td>Simulation</td>
<td>Terminal eval.</td>
<td>-</td>
</tr>
<tr>
<td>09</td>
<td>DI/DO 9 (X132.2)</td>
<td>Simulation</td>
<td>Terminal eval.</td>
<td>-</td>
</tr>
<tr>
<td>10</td>
<td>DI/DO 10 (X132.3)</td>
<td>Simulation</td>
<td>Terminal eval.</td>
<td>-</td>
</tr>
<tr>
<td>11</td>
<td>DI/DO 11 (X132.4)</td>
<td>Simulation</td>
<td>Terminal eval.</td>
<td>-</td>
</tr>
<tr>
<td>16</td>
<td>DI 16 (X130.1)</td>
<td>Simulation</td>
<td>Terminal eval.</td>
<td>-</td>
</tr>
<tr>
<td>17</td>
<td>DI 17 (X130.2)</td>
<td>Simulation</td>
<td>Terminal eval.</td>
<td>-</td>
</tr>
<tr>
<td>18</td>
<td>DI 18 (X130.3)</td>
<td>Simulation</td>
<td>Terminal eval.</td>
<td>-</td>
</tr>
<tr>
<td>19</td>
<td>DI 19 (X130.4)</td>
<td>Simulation</td>
<td>Terminal eval.</td>
<td>-</td>
</tr>
<tr>
<td>20</td>
<td>DI 20 (X131.1)</td>
<td>Simulation</td>
<td>Terminal eval.</td>
<td>-</td>
</tr>
<tr>
<td>21</td>
<td>DI 21 (X131.2)</td>
<td>Simulation</td>
<td>Terminal eval.</td>
<td>-</td>
</tr>
<tr>
<td>22</td>
<td>DI 22 (X131.4)</td>
<td>Simulation</td>
<td>Terminal eval.</td>
<td>-</td>
</tr>
</tbody>
</table>

#### p0796

**CU digital inputs simulation mode setpoint / CU DI simul setp**

- **CU_S110-CAN,**
- **CU_S110-DP,**
- **CU_S110-PN**

- **Can be changed:** U, T
- **Calculated:** -
- **Access level:** 2
- **Data type:** Unsigned32
- **Dynamic index:** -
- **Func. diagram:** 1510, 2020, 2030, 2031, 2100, 2120, 2130, 2131, 2132, 2133
- **P-Group:** Commands
- **Units group:** -
- **Scaling:** -
- **Expert list:** 1

**Description:**
Sets the setpoint for the input signals in the digital input simulation mode.

**Dependency:**
The setpoint for the input signals is specified using p0796.

**Notice:**
If a digital input is used as signal source for the function "STO" (BI: p9620) then it is not permissible to select the simulation mode and this is rejected.

**Note:**
This parameter is not saved when data is backed-up (p0971, p0977).

**DI:** Digital Input

**DI/DO:** Bidirectional Digital Input/Output

**Bit field:**

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>DI 0 (X133.1)</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>01</td>
<td>DI 1 (X133.2)</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>02</td>
<td>DI 2 (X133.3)</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>03</td>
<td>DI 3 (X133.4)</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>08</td>
<td>DI/DO 8 (X132.1)</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>09</td>
<td>DI/DO 9 (X132.2)</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>10</td>
<td>DI/DO 10 (X132.3)</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>11</td>
<td>DI/DO 11 (X132.4)</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>16</td>
<td>DI 16 (X130.1)</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>17</td>
<td>DI 17 (X130.2)</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
</tbody>
</table>
### p0797 CU analog input simulation mode / CU AI sim_mode

<table>
<thead>
<tr>
<th>CU_S110-CAN,</th>
<th>Data type: Integer16</th>
<th>Access level: 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>CU_S110-DP,</td>
<td>P-Group: Terminals</td>
<td>Dynamic index: -</td>
</tr>
<tr>
<td>CU_S110-PN</td>
<td></td>
<td>units group: -</td>
</tr>
<tr>
<td></td>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
</tr>
<tr>
<td></td>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Factory setting</td>
<td></td>
</tr>
</tbody>
</table>

**Description:**
Sets the simulation mode for the analog input.

**Value:**
0: No simulation mode for analog input x
1: Simulation mode for analog input x

**Dependency:**
The setpoint for the input voltage is specified via p0798.

**Note:**
This parameter is not saved when data is backed-up (p0971, p0977).

**AI:** Analog Input

### p0798 CU analog input simulation mode setpoint / CU AI sim_setp

<table>
<thead>
<tr>
<th>CU_S110-CAN,</th>
<th>Data type: FloatingPoint32</th>
<th>Access level: 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>CU_S110-DP,</td>
<td>P-Group: Terminals</td>
<td>Dynamic index: -</td>
</tr>
<tr>
<td>CU_S110-PN</td>
<td>Not for motor type: -</td>
<td>units group: -</td>
</tr>
<tr>
<td></td>
<td>Min</td>
<td>Scaling: -</td>
</tr>
<tr>
<td></td>
<td>-20.000 [V]</td>
<td>Max</td>
</tr>
<tr>
<td></td>
<td>0.000 [V]</td>
<td></td>
</tr>
</tbody>
</table>

**Description:**
Sets the setpoint for the input value in the simulation mode of the analog input.

**Dependency:**
The simulation of an analog input is selected using p797.
If AI is parameterized as voltage input (p756), then the setpoint is a voltage in V. If AI is parameterized as current input (p756), then the setpoint is current in mA.

**Note:**
This parameter is not saved when data is backed-up (p0971, p0977).

**AI:** Analog Input

### p0799[0...2] CU inputs/outputs, sampling time / CU I/O t_sample

<table>
<thead>
<tr>
<th>CU_S110-CAN,</th>
<th>Data type: FloatingPoint32</th>
<th>Access level: 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>CU_S110-DP,</td>
<td>P-Group: Commands</td>
<td>Dynamic index: -</td>
</tr>
<tr>
<td>CU_S110-PN</td>
<td>Not for motor type: -</td>
<td>Units group: -</td>
</tr>
<tr>
<td></td>
<td>Min</td>
<td>Scaling: -</td>
</tr>
<tr>
<td></td>
<td>1000.00 [µs]</td>
<td>Max</td>
</tr>
<tr>
<td></td>
<td>4000.00 [µs]</td>
<td></td>
</tr>
</tbody>
</table>

**Description:**
Sets the sampling time for the inputs and outputs of the Control Unit.
## List of parameters

### Index:
- [0] = Digital inputs/outputs (DI/DO)
- [1] = Analog inputs (AI)
- [2] = Not available - analog outputs (AO)

### Dependency:
- The parameter can only be modified for p0009 = 3, 29.

Refer to: p0009

### Note:
- The changed sampling time is immediately effective after a completed sub-boot (p0009 -> 0).

---

### p0802  Data transfer: memory card as source/target / mem_card src/targ

<table>
<thead>
<tr>
<th>CU_S110-CAN, CU_S110-DP, CU_S110-PN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed: T</td>
</tr>
<tr>
<td>Data type: Integer16</td>
</tr>
<tr>
<td>P-Group: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
</tr>
<tr>
<td>Min</td>
</tr>
<tr>
<td>Max</td>
</tr>
<tr>
<td>Calculated: -</td>
</tr>
<tr>
<td>Dynamic index: -</td>
</tr>
<tr>
<td>Units group: -</td>
</tr>
<tr>
<td>Scaling: -</td>
</tr>
<tr>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Factory setting</td>
</tr>
<tr>
<td>0</td>
</tr>
<tr>
<td>100</td>
</tr>
<tr>
<td>0</td>
</tr>
</tbody>
</table>

**Description:**
- Sets the number for data transfer of a parameter backup from/to memory card (p0804 = 1):
  - Sets the source of parameter backup (e.g. p0802 = 48 -> PS048xxx.ACX is the source).
  - Sets the target of parameter backup (e.g. p0802 = 23 -> PS023xxx.ACX is the target).
- No setting is required for the transfer of the communication configuration (p0804 = 12).

**Dependency:**
- Refer to: p0803, p0804

**Notice:**
- If the data between the volatile and non-volatile device memories differ, then it may be necessary to save the data on the memory card in a non-volatile fashion prior to the transfer (e.g. p0971 = 1).

---

### p0803  Data transfer: device memory as source/target / Dev_mem src/targ

<table>
<thead>
<tr>
<th>CU_S110-CAN, CU_S110-DP, CU_S110-PN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed: T</td>
</tr>
<tr>
<td>Data type: Integer16</td>
</tr>
<tr>
<td>P-Group: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
</tr>
<tr>
<td>Min</td>
</tr>
<tr>
<td>Max</td>
</tr>
<tr>
<td>Calculated: -</td>
</tr>
<tr>
<td>Dynamic index: -</td>
</tr>
<tr>
<td>Units group: -</td>
</tr>
<tr>
<td>Scaling: -</td>
</tr>
<tr>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Factory setting</td>
</tr>
<tr>
<td>0</td>
</tr>
<tr>
<td>12</td>
</tr>
<tr>
<td>0</td>
</tr>
</tbody>
</table>

**Description:**
- Sets the number for data transfer of a parameter backup from/to device memory (p0804 = 1):
  - Sets the target of the parameter backup (e.g. p0803 = 10 -> PS010xxx.ACX is the target).
  - Sets the source of the parameter backup (e.g. p0803 = 11 -> PS011xxx.ACX is the source).
- No setting is required for the transfer of the communication configuration (p0804 = 12).

**Value:**
- 0: Source/target standard
- 10: Source/target with setting 10
- 11: Source/target with setting 11
- 12: Source/target with setting 12

**Dependency:**
- Refer to: p0802, p0804

**Notice:**
- If the data between the volatile and non-volatile device memories differ, then it may be necessary to save the data on the memory card in a non-volatile fashion prior to the transfer (e.g. p0971 = 1).

---

### p0804  Data transfer start / Data transf start

<table>
<thead>
<tr>
<th>CU_S110-CAN, CU_S110-DP, CU_S110-PN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed: T</td>
</tr>
<tr>
<td>Data type: Integer16</td>
</tr>
<tr>
<td>P-Group: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
</tr>
<tr>
<td>Min</td>
</tr>
<tr>
<td>Max</td>
</tr>
<tr>
<td>Calculated: -</td>
</tr>
<tr>
<td>Dynamic index: -</td>
</tr>
<tr>
<td>Units group: -</td>
</tr>
<tr>
<td>Scaling: -</td>
</tr>
<tr>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Factory setting</td>
</tr>
<tr>
<td>0</td>
</tr>
<tr>
<td>1100</td>
</tr>
<tr>
<td>0</td>
</tr>
</tbody>
</table>

**Description:**
- Sets the transfer direction and start of data transfer between the memory card and non-volatile device memory.
Example 1:
The parameter backup is to be transferred from the device memory to the memory card with setting 0. The parameter backup is to be stored on the memory card with setting 22.
p0802 = 22 (parameter backup stored on memory card as target with setting 22)
p0803 = 0 (parameter backup stored in device memory as source with setting 0)
p0804 = 2 (start data transfer from device memory to memory card)
--> PS000xxx.ACX is transferred from device memory to memory card and stored as PS022xxx.ACX.
Example 2:
The parameter backup is to be transferred from the memory card to the device memory with setting 22. The parameter backup is to be stored in the device memory as setting 0.
p0802 = 22 (parameter backup stored on memory card as source with setting 22)
p0803 = 0 (parameter backup stored in device memory as target with setting 0)
p0804 = 1 (start data transfer from memory card to device memory)
--> PS022xxx.ACX is transferred from memory card to device memory and stored as PS000xxx.ACX.
Example 3:
The communication configuration is to be transferred from the device memory to the memory card.
p0802 = (not relevant)
p0803 = (not relevant)
p0804 = 12 (start data transfer from device memory to memory card)
--> The files that are relevant for the communication configuration are transferred from the device memory to the memory card and stored in the /SIEMENS/SINAMICS/DATA/CFG directory.

Value:
0: Inactive
1: Memory card to device memory
2: Device memory to memory card
12: Device memory (communication configuration) to memory card
1001: File on memory card cannot be opened
1002: File in device memory cannot be opened
1003: Memory card not found
1100: File cannot be transferred

Dependency:
Refer to: p0802, p0803

Notice:
The memory card must not be removed while data is being transferred.

Note:
If a parameter backup with setting 0 is detected on the memory card when the Control Unit is switched on (PS000xxx.ACX), this is transferred automatically to the device memory.
When the memory card is inserted, a parameter backup with setting 0 (PS000xxx.ACX) is automatically written to the memory card when the parameters are saved in a non-volatile memory (e.g. by means of "Copy RAM to ROM").
Once the data has been successfully transferred, this parameter is automatically reset to 0. If an error occurs, the parameter is set to a value > 1000. Possible fault causes:
p0804 = 1001:
The parameter backup set in p0802 as the source on the memory card does not exist or there is not sufficient memory space available on the memory card.
p0804 = 1002:
The parameter backup set in p0803 as the source in the device memory does not exist or there is not sufficient memory space available in the device memory.
p0804 = 1003:
The parameter backup set in p0803 as the source in the device memory does not exist or there is not sufficient memory space available in the device memory.
p0804 = 1100:
No memory card has been inserted.

p0806 BI: Inhibit master control / PcCtrl inhibit
SERVO_S110-CAN,
SERVO_S110-DP,
SERVO_S110-PN

Can be changed: T Calculated: - Access level: 3
Data type: Unsigned32 / Binary Dynamic index: - Func. diagram: -
P-Group: Commands Units group: - Unit selection: -
Not for motor type: - Scaling: - Expert list: 1
Min Max
- -

Description:
Sets the signal source to block the master control.

Dependency:
Refer to: r0807
**Parameter**

**List of parameters**

---

**Note:**

The master control is used from the commissioning software (drive control panel) and from the Advanced Operator Panel (AOP, LOCAL mode).

---

**r0807.0**

**BO: Master control active / PcCtrl active**

- **Can be changed:** -
- **Data type:** Unsigned8
- **Dynamic index:** -
- **Func. diagram:** -
- **Not for motor type:** -
- **P-Group:** Displays, signals
- **Units group:** -
- **Unit selection:** -
- **Min:** Max
- **Max:** -

**Description:**

Displays what has the master control.

The drive can be controlled via the BICO interconnection or from external (e.g. the commissioning software).

**Dependency:**

Refer to: p0806

**Notice:**

The master control only influences control word 1 and speed setpoint 1. Other control words/setpoints can be transferred from another automation device.

**Note:**

Bit 0 = 0: BICO interconnection active
Bit 0 = 1: Master control for PC/AOP

The master control is used from the commissioning software (drive control panel) and from the Advanced Operator Panel (AOP, LOCAL mode).

---

**p0809[0...2]**

**Copy Command Data Set CDS / Copy CDS**

- **Can be changed:** T
- **Data type:** Unsigned32 / Binary
- **Dynamic index:** -
- **Func. diagram:** 8560
- **Not for motor type:** -
- **P-Group:** Commands
- **Units group:** -
- **Unit selection:** -
- **Min:** Max
- **Max:** -

**Description:**

Copies one Command Data Set (CDS) into another.

**Index:**

[0] = Source Command Data Set
[1] = Target Command Data Set
[2] = Start copying procedure

**Note:**

Procedure:

1. In Index 0, enter which command data set should be copied.
2. In Index 1, enter the command data set that is to be copied into.
3. Start copying: Set index 2 from 0 to 1.

p0809[2] is automatically set to 0 when copying is completed.

---

**p0810**

**BI: Command data set selection CDS bit 0 / CDS select., bit 0**

- **Can be changed:** T
- **Data type:** Unsigned32 / Binary
- **Dynamic index:** -
- **Func. diagram:** 8560
- **Not for motor type:** -
- **P-Group:** Commands
- **Units group:** -
- **Unit selection:** -
- **Min:** Max
- **Max:** -

**Description:**

Sets the signal source to select the Command Data Set bit 0 (CDS bit 0).

**Dependency:**

Refer to: r0050, r0836

**Notice:**

The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

**Note:**

The Command Data Set selected using the binector inputs is displayed in r0836.

The currently effective command data set is displayed in r0050.

A Command Data Set can be copied using p0809.
### Parameter List

#### p0819[0...2] Copy Drive Data Set DDS / Copy DDS

<table>
<thead>
<tr>
<th>Description:</th>
<th>Copies one Drive Data Set (DDS) into another.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Index:</td>
<td>[0] = Source Drive Data Set</td>
</tr>
<tr>
<td></td>
<td>[1] = Target Drive Data Set</td>
</tr>
<tr>
<td></td>
<td>[2] = Start copying procedure</td>
</tr>
<tr>
<td>Note:</td>
<td>Procedure:</td>
</tr>
<tr>
<td></td>
<td>1. In Index 0, enter which drive data set is to be copied.</td>
</tr>
<tr>
<td></td>
<td>2. In Index 1, enter the drive data set data that is to be copied into.</td>
</tr>
<tr>
<td></td>
<td>3. Start copying: Set index 2 from 0 to 1.</td>
</tr>
</tbody>
</table>

#### p0820[0...n] BI: Drive Data Set selection DDS bit 0 / DDS select., bit 0

| Description: | Sets the signal source to select the Drive Data Set, bit 0 (DDS, bit 0). |
| Dependency:  | Refer to: r0051, r0837 |
| Notice:      | The parameter may be protected as a result of p0922 or p2079 and cannot be changed. |

#### p0826[0...n] Motor changeover, motor number / Mot_chng mot No.

| Description: | Sets the freely-assignable motor number for the motor changeover. |
| Dependency:  | Refer to: p0827 |
| Caution:     | When changing over motor data sets with the same motor number (e.g. star-delta changeover) and for a motor with brake, the motor brake remains open during the changeover. |
| Note:        | When the motor data sets are changed over, the following applies: The same motor number signifies the same thermal model. |

#### p0827[0...n] Motor changeover status word bit number / Mot_chg ZSW bitNo.

| Description: | Sets the bit number for every motor data set. |

---

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SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3
Example:
p0827[0] = 0: For MDS0, r0830.0 is switched.
p0827[1] = 5: For MDS1, r0830.5 is switched.

Dependency:
Refer to: p0826, r0830

Note:
A motor is only changed over (a new motor selected) after the pulses have been suppressed.
When the motor data sets are changed over, the following applies:
Bit numbers that are not identical, signify that the motor must be changed over.

<table>
<thead>
<tr>
<th>p0828[0...n]</th>
<th>BI: Motor changeover, feedback signal / Mot_chg fdbk sig</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</strong></td>
<td>Can be changed: C2(3), T</td>
</tr>
<tr>
<td><strong>Data type:</strong> Unsigned32 / Binary</td>
<td>Calculated: -</td>
</tr>
<tr>
<td><strong>P-Group:</strong> Motor</td>
<td>Dynamic index: CDS, p0170</td>
</tr>
<tr>
<td><strong>Not for motor type:</strong> -</td>
<td>Access level: 3</td>
</tr>
<tr>
<td><strong>Min</strong></td>
<td>Expert list: 1</td>
</tr>
<tr>
<td><strong>Max</strong></td>
<td>-</td>
</tr>
<tr>
<td><strong>Access level:</strong></td>
<td>0</td>
</tr>
</tbody>
</table>

Description:
Sets the signal source for the feedback signal when changing over the motor.

Dependency:
Refer to: p0833

Notice:
The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

<table>
<thead>
<tr>
<th>r0830.0...15</th>
<th>CO/BO: Motor changeover, status word / Mot_chngov ZSW</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</strong></td>
<td>Can be changed: -</td>
</tr>
<tr>
<td><strong>Data type:</strong> Unsigned16</td>
<td>Calculated: -</td>
</tr>
<tr>
<td><strong>P-Group:</strong> Displays, signals</td>
<td>Dynamic index: -</td>
</tr>
<tr>
<td><strong>Not for motor type:</strong> -</td>
<td>Access level: 2</td>
</tr>
<tr>
<td><strong>Min</strong></td>
<td>Expert list: 1</td>
</tr>
<tr>
<td><strong>Max</strong></td>
<td>-</td>
</tr>
<tr>
<td><strong>Factory setting</strong></td>
<td>-</td>
</tr>
</tbody>
</table>

Description:
Displays the status word of the motor changeover.
These signals can be connected to digital outputs to change over the motor.

<table>
<thead>
<tr>
<th>Bit field</th>
<th>Bit</th>
<th>Signal name</th>
</tr>
</thead>
<tbody>
<tr>
<td>00 Motor selection, bit 0</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>01 Motor selection, bit 1</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>02 Motor selection, bit 2</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>03 Motor selection, bit 3</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>04 Motor selection, bit 4</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>05 Motor selection, bit 5</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>06 Motor selection, bit 6</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>07 Motor selection, bit 7</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>08 Motor selection, bit 8</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>09 Motor selection, bit 9</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>10 Motor selection, bit 10</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>11 Motor selection, bit 11</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>12 Motor selection, bit 12</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>13 Motor selection, bit 13</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>14 Motor selection, bit 14</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>15 Motor selection, bit 15</td>
<td>High</td>
<td>Low</td>
</tr>
</tbody>
</table>

Dependency:
Refer to: p0827
**Description:**
Sets the signal source for the feedback signal of the contactors when changing over motors. There is a fixed inter-relationship between energizing the contactor and the feedback signal.

Example:
A changeover is to be made between MDS0 (motor 0) and MDS1 (motor 1). The contactors should be switched using bit 4 (contactor 0) and 5 (contactor 1). The changeover should be made with an interconnection of the feedback signal.

Implementation:
MDS0: p0827[0] = 4, interconnect output to switch contactor 0 to r0830.4, p0831[4] = "input, feedback signal, contactor 0"
MDS1: p0827[1] = 5, interconnect output to switch contactor 1 to r0830.5, p0831[5] = "input, feedback signal, contactor 1"

The following sequence applies when changing over from MDS0 to MDS1:
1. The status bit r0830.4 is deleted. When the feedback signal (p0831[4]) is connected, the system waits until the feedback signal "contactor open" is displayed. If the feedback signal is not connected, then the system waits for the switch-off interlocking time of 320 ms.
2. The status bit r0830.5 is set. If the feedback signal (p0831[5]) is connected, the system waits until the feedback signal "contactor closed" is displayed. If the feedback signal is not connected, then the system waits for the switch-on interlocking time of 160 ms.

**Index:**

- **[0]** Feedback signal contactor 0
- **[1]** Feedback signal contactor 1
- **[2]** Feedback signal contactor 2
- **[3]** Feedback signal contactor 3
- **[4]** Feedback signal contactor 4
- **[5]** Feedback signal contactor 5
- **[6]** Feedback signal contactor 6
- **[7]** Feedback signal contactor 7
- **[8]** Feedback signal contactor 8
- **[9]** Feedback signal contactor 9
- **[10]** Feedback signal contactor 10
- **[11]** Feedback signal contactor 11
- **[12]** Feedback signal contactor 12
- **[13]** Feedback signal contactor 13
- **[14]** Feedback signal contactor 14
- **[15]** Feedback signal contactor 15

**r0832.0...15**
**CO/BO: Mot. changeover, contactor feedback sig. status word / Mot_chg fdbk ZSW**

**Description:**
Displays the status word of the contactor feedback signals when changing over a motor.

**Bit field:**

- **00** Feedback signal contactor 0
- **01** Feedback signal contactor 1
- **02** Feedback signal contactor 2
- **03** Feedback signal contactor 3
- **04** Feedback signal contactor 4

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Feedback signal contactor 0</td>
<td>Closed</td>
<td>Opened</td>
<td>-</td>
</tr>
<tr>
<td>01</td>
<td>Feedback signal contactor 1</td>
<td>Closed</td>
<td>Opened</td>
<td>-</td>
</tr>
<tr>
<td>02</td>
<td>Feedback signal contactor 2</td>
<td>Closed</td>
<td>Opened</td>
<td>-</td>
</tr>
<tr>
<td>03</td>
<td>Feedback signal contactor 3</td>
<td>Closed</td>
<td>Opened</td>
<td>-</td>
</tr>
<tr>
<td>04</td>
<td>Feedback signal contactor 4</td>
<td>Closed</td>
<td>Opened</td>
<td>-</td>
</tr>
</tbody>
</table>
Parameter

List of parameters

05 Feedback signal contactor 5  Closed  Opened  -
06 Feedback signal contactor 6  Closed  Opened  -
07 Feedback signal contactor 7  Closed  Opened  -
08 Feedback signal contactor 8  Closed  Opened  -
09 Feedback signal contactor 9  Closed  Opened  -
10 Feedback signal contactor 10  Closed  Opened  -
11 Feedback signal contactor 11  Closed  Opened  -
12 Feedback signal contactor 12  Closed  Opened  -
13 Feedback signal contactor 13  Closed  Opened  -
14 Feedback signal contactor 14  Closed  Opened  -
15 Feedback signal contactor 15  Closed  Opened  -

Dependency:  Refer to: p0831

p0833  Data set changeover configuration / DS_chng config

SERVO_S110-CAN,  SERVO_S110-DP,  SERVO_S110-PN

Can be changed: C2(15)  Calculated: -  Access level: 2
Data type: Unsigned16  Dynamic index: -  Func. diagram: 8575
P-Group: Data sets
Units group: -  Unit selection: -
Not for motor type: -  Scaling: -
Expert list: 1
Min  Max  Factory setting
-  -  0000 bin

Description:  Sets the configuration for the motor and encoder changeover.

Note:
Re bit 00:
When the bit is set and the motor has to be changed over, then p0827 must be set differently in the appropriate motor data sets.
Re bit 02:
The bit defines whether, for an EDS changeover, the status signal Gn_ZSW.14 is suppressed (parking encoder active).

r0835.0...11  CO/BO: Data set changeover status word / DDS_ZSW

SERVO_S110-CAN,  SERVO_S110-DP,  SERVO_S110-PN

Can be changed: -  Calculated: -  Access level: 2
Data type: Unsigned16  Dynamic index: -  Func. diagram: 8575
P-Group: Displays, signals
Units group: -  Unit selection: -
Not for motor type: -  Scaling: -
Expert list: 1
Min  Max  Factory setting
-  -  -

Description:
Displays the status word for the drive data set changeover.

Note:
This parameter is only supplied with up-to-date values if data set changeover has been selected or is running.
Re bit 00:
The signal is only influenced when a motor changeover is set via p0827 (unequal bit numbers).
Re bit 01:
The signal is only influenced when an encoder changeover is set via p0187, p0188, or p0189.
Re bit 02:
A data set changeover is delayed by the time required for the internal parameter calculation.
Re bit 04:
A data set changeover is only carried out when the armature short circuit is not activated.
Re bit 05:
The following applies for SERVO:
A data set changeover is only carried out when pole position identification, encoder adjustment, motor data identification, and rotating measurement are not running.
The following applies for VECTOR:
A data set changeover is only carried out when pole position identification is not running.
Re bit 06:
A data set changeover is only carried out when the friction characteristic record is not running.
Re bit 07 (VECTOR only):
A data set changeover is only carried out when rotating measurement is not running.
Re bit 08 (VECTOR only):
A data set changeover is only carried out when motor data identification is not running.
Re bit 10:
A motor changeover is set with p0833.1 = 1. It can only be carried out when the application performs pulse suppression.
Re bit 11:
A motor changeover is set with p0833.0 = 1. The pulses are only enabled when the "Motor changeover feedback" signal is detected.

---

### r0836.0...1
**CO/BO: Command Data Set CDS selected / CDS selected**

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed: -</td>
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<tr>
<td>Calculated: -</td>
</tr>
<tr>
<td>Access level: 2</td>
</tr>
<tr>
<td>Data type: Unsigned8</td>
</tr>
<tr>
<td>Dynamic index: -</td>
</tr>
<tr>
<td>Func. diagram: 1530, 8560</td>
</tr>
<tr>
<td>P-Group: Displays, signals</td>
</tr>
<tr>
<td>Units group: -</td>
</tr>
<tr>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
</tr>
<tr>
<td>Scaling: -</td>
</tr>
<tr>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
</tr>
<tr>
<td>Max</td>
</tr>
<tr>
<td>Factory setting</td>
</tr>
<tr>
<td>00 CDS select. bit 0</td>
</tr>
<tr>
<td>ON</td>
</tr>
<tr>
<td>OFF</td>
</tr>
<tr>
<td>01 CDS select. bit 1</td>
</tr>
<tr>
<td>ON</td>
</tr>
<tr>
<td>OFF</td>
</tr>
</tbody>
</table>

**Description:** Displays the command data set (CDS) selected via the binector input.

**Dependency:** Refer to: r0050, p0810

**Note:** Command data sets are selected via binector input p0810 and following.
The currently effective command data set is displayed in r0050.

### r0837.0...1
**CO/BO: Drive Data Set DDS selected / DDS selected**

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed: -</td>
</tr>
<tr>
<td>Calculated: -</td>
</tr>
<tr>
<td>Access level: 2</td>
</tr>
<tr>
<td>Data type: Unsigned8</td>
</tr>
<tr>
<td>Dynamic index: -</td>
</tr>
<tr>
<td>Func. diagram: 8565</td>
</tr>
<tr>
<td>P-Group: Displays, signals</td>
</tr>
<tr>
<td>Units group: -</td>
</tr>
<tr>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
</tr>
<tr>
<td>Scaling: -</td>
</tr>
<tr>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
</tr>
<tr>
<td>Max</td>
</tr>
<tr>
<td>Factory setting</td>
</tr>
<tr>
<td>00 DDS select. bit 0</td>
</tr>
<tr>
<td>ON</td>
</tr>
<tr>
<td>OFF</td>
</tr>
<tr>
<td>01 DDS select. bit 1</td>
</tr>
<tr>
<td>ON</td>
</tr>
<tr>
<td>OFF</td>
</tr>
</tbody>
</table>

**Description:** Displays the drive data set (DDS) selected via the binector input.

**Dependency:** Refer to: r0051, p0820
Note: Drive data sets are selected via binector input p0820 and following. The currently effective drive data set is displayed in r0051. If there is only one data set, then a value of 0 is displayed in this parameter and not the selection via binector inputs.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Index</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>r0838[0...3] Motor/Encoder Data Set selected / MDS/EDS selected</td>
<td>Displays the selected Motor Data Set (MDS) and the selected Encoder Data Sets (EDS).</td>
<td></td>
<td>Refer to: r0049, p0186, p0187, p0188</td>
<td>Value 99 means the following: No encoder assigned (not configured).</td>
</tr>
<tr>
<td>p0839 Motor changeover contactor control delay time / Mot_chg ctrl t_del</td>
<td>Sets the delay time for the contactor control for the motor changeover.</td>
<td></td>
<td></td>
<td>The delay time is taken into account in the following cases:</td>
</tr>
<tr>
<td>p0840[0...n] BI: ON / OFF (OFF1) / ON / OFF (OFF1)</td>
<td>Sets the signal source for the command &quot;ON/OFF (OFF1)&quot;.</td>
<td></td>
<td></td>
<td>For the PROFIdrive profile, this command corresponds to control word 1 bit 0 (STW1.0).</td>
</tr>
</tbody>
</table>

For binector input p0840 = 0 signal, the motor can be moved, jogging using binector input p1055 or p1056. The command "ON/OFF (OFF1)" can be issued using binector input p0840 or p1055/p1056. For binector input p0840 = 0 signal, the switch-on inhibit is acknowledged. Only the signal source that originally powered up can also power down again. The parameter may be protected as a result of p0922 or p2079 and cannot be changed. |
Note: For drives with closed-loop speed control (p1300 = 20, 21), the following applies:
- BI: p0840 = 0 signal: OFF1 (braking with the ramp-function generator, then pulse suppression)

For drives with closed-loop torque control (p1300 = 22, 23), the following applies:
- BI: p0840 = 0 signal: immediate pulse cancellation

For drives with closed-loop speed/torque control, the following applies:
- BI: p0840 = 0/1 signal: ON (pulses can be enabled)

For drives with closed-loop speed control (activated using p1501), the following applies:
- BI: p0840 = 0 signal: No dedicated braking response, but pulse suppression when standstill is detected (p1226, p1227)

For active infeeds (Active Line Module and Smart Line Module) the following applies:
- BI: p0840 = 0 signal: OFF1 (reduce Vdc along the ramp, then pulse suppression and pre-charging contactor/line contactor open)
- BI: p0840 = 0/1 signal: ON (pre-charging contactor/line contactor close, pulses can be enabled)

For passive infeeds (Basic Line Module) the following applies:
- BI: p0840 = 0 signal: OFF1 (pre-charging contactor/line contactor open)
- BI: p0840 = 0/1 signal: ON (pre-charging contactor/line contactor close)

Note:
- p0863.1 of a drive can also be selected as signal source.

Description:
Sets the first signal source for the command "No coast down/coast down (OFF2)"

The following signals are AND’ed:
- BI: p0844 "No coast-down / coast-down (OFF2) signal source 1"
- BI: p0845 "No coast-down / coast-down (OFF2) signal source 2"

For the PROFIdrive profile, the result of the AND logic operation corresponds to control word 1 bit 1 (STW1.1).
BI: p0844 = 0 signal or BI: p0845 = 0 signal
- OFF2 (immediate pulse suppression and switch on inhibit)
BI: p0844 = 1 signal and BI: p0845 = 1 signal
- No OFF2 (enable is possible)

Caution:
When "master control from PC" is activated, this binector input is ineffective.

Notice: The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

Note: For Active Line Modules, Smart Line Modules and binector input p0844 = 0 signal or p0845 = 0 signal, the following applies:
- pre-charging contactor/line contactor is additionally opened.

Description:
Sets the second signal source for the command "No coast down/coast down (OFF2)".
The following signals are AND'ed:
- BI: p0844 "No coast-down / coast-down (OFF2) signal source 1"
- BI: p0845 "No coast-down / coast-down (OFF2) signal source 2"
For the PROFIdrive profile, the result of the AND logic operation corresponds to control word 1 bit 1 (STW1.1).
BI: p0844 = 0 signal or BI: p0845 = 0 signal
- OFF2 (immediate pulse suppression and switch on inhibit)
BI: p0844 = 1 signal and BI: p0845 = 1 signal
- No OFF2 (enable is possible)

Caution:
When "master control from PC" is activated, this binector input is effective.

Note:
For Active Line Modules, Smart Line Modules and binector input p0844 = 0 signal or p0845 = 0 signal, the following applies:
- pre-charging contactor/line contactor is additionally opened.

### p0848[0...n]
**BI: No Quick Stop / Quick Stop (OFF3) signal source 1 / OFF3 S_src 1**

**Description:**
Sets the first signal source for the command "No quick stop/quick stop (OFF3)".

The following signals are AND'ed:
- BI: p0848 "No quick stop / quick stop (OFF3) signal source 1"
- BI: p0849 "No quick stop / quick stop (OFF3) signal source 2"
For the PROFIdrive profile, the result of the AND logic operation corresponds to control word 1 bit 2 (STW1.2).
BI: p0848 = 0 signal or BI: p0849 = 0 signal
- OFF3 (braking along the OFF3 ramp (p1135), then pulse suppression and switch on inhibit)
BI: p0848 = 1 signal and BI: p0849 = 1 signal
- No OFF3 (enable is possible)

Caution:
When "master control from PC" is activated, this binector input is ineffective.

### p0849[0...n]
**BI: No Quick Stop / Quick Stop (OFF3) signal source 2 / OFF3 S_src 2**

**Description:**
Sets the second signal source for the command "No quick stop/quick stop (OFF3)".

The following signals are AND'ed:
- BI: p0848 "No quick stop / quick stop (OFF3) signal source 1"
- BI: p0849 "No quick stop / quick stop (OFF3) signal source 2"
For the PROFIdrive profile, the result of the AND logic operation corresponds to control word 1 bit 2 (STW1.2).
BI: p0848 = 0 signal or BI: p0849 = 0 signal
- OFF3 (braking along the OFF3 ramp (p1135), then pulse suppression and switch on inhibit)
BI: p0848 = 1 signal and BI: p0849 = 1 signal
- No OFF3 (enable is possible)
<table>
<thead>
<tr>
<th>Parameter</th>
<th>BI: Enable operation/inhibit operation / Operation enable</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description:</strong></td>
<td>Sets the signal source for the command &quot;enable operation/inhibit operation&quot;. For the PROFIdrive profile, this command corresponds to control word 1 bit 3 (STW1.3). Bi: p0852 = 0 signal Inhibit operation (suppress pulses). Bi: p0852 = 1 signal Enable operation (pulses can be enabled).</td>
</tr>
<tr>
<td><strong>Notice:</strong></td>
<td>The parameter may be protected as a result of p0922 or p2079 and cannot be changed.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>BI: Control by PLC/no control by PLC / Master ctrl by PLC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description:</strong></td>
<td>Sets the signal source for the command &quot;control by PLC/no control by PLC&quot;. For the PROFIdrive profile, this command corresponds to control word 1 bit 10 (STW1.10). Bi: p0854 = 0 signal No control by PLC Bi: p0854 = 1 signal Control by PLC.</td>
</tr>
<tr>
<td><strong>Notice:</strong></td>
<td>The parameter may be protected as a result of p0922 or p2079 and cannot be changed.</td>
</tr>
<tr>
<td><strong>Note:</strong></td>
<td>This bit is used to initiate a response for the drives when the control fails (F07220). If there is no control available, then biector input p0854 should be set to 1. If a control is available, then STW1.10 must be set to 1 (PZD1) so that the received data is updated. This applies regardless of the setting in p0854 and even in the case of free telegram configuration (p0922 = 999).</td>
</tr>
</tbody>
</table>
**p0855[0...n]**  
**BI: Unconditionally release holding brake / Uncond open brake**

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

<table>
<thead>
<tr>
<th>Can be changed:</th>
<th>T</th>
<th>Calculated:</th>
<th>-</th>
<th>Access level:</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Data type:</strong></td>
<td>Unsigned32 / Binary</td>
<td><strong>Dynamic index:</strong></td>
<td>CDS, p0170</td>
<td><strong>Func. diagram:</strong></td>
<td>2501, 2701, 2707</td>
</tr>
<tr>
<td><strong>P-Group:</strong></td>
<td>Commands</td>
<td><strong>Units group:</strong></td>
<td>-</td>
<td><strong>Unit selection:</strong></td>
<td>-</td>
</tr>
<tr>
<td><strong>Not for motor type:</strong></td>
<td>-</td>
<td><strong>Scaling:</strong></td>
<td>-</td>
<td><strong>Expert list:</strong></td>
<td>1</td>
</tr>
<tr>
<td><strong>Min</strong></td>
<td>-</td>
<td><strong>Max</strong></td>
<td>-</td>
<td><strong>Factory setting</strong></td>
<td>0</td>
</tr>
</tbody>
</table>

**Description:**  
Sets the signal source for the command "unconditionally open holding brake".

**Dependency:**  
Refer to: p0858

**Notice:**  
The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

**Note:**  
The signal via BI: p0858 (unconditionally close holding brake) has a higher priority than via BI: p0855 (unconditionally open holding brake).

**p0856[0...n]**  
**BI: Speed controller enable / n_ctrl enable**

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

<table>
<thead>
<tr>
<th>Can be changed:</th>
<th>T</th>
<th>Calculated:</th>
<th>-</th>
<th>Access level:</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Data type:</strong></td>
<td>Unsigned32 / Binary</td>
<td><strong>Dynamic index:</strong></td>
<td>CDS, p0170</td>
<td><strong>Func. diagram:</strong></td>
<td>2501, 2701, 2707</td>
</tr>
<tr>
<td><strong>P-Group:</strong></td>
<td>Commands</td>
<td><strong>Units group:</strong></td>
<td>-</td>
<td><strong>Unit selection:</strong></td>
<td>-</td>
</tr>
<tr>
<td><strong>Not for motor type:</strong></td>
<td>-</td>
<td><strong>Scaling:</strong></td>
<td>-</td>
<td><strong>Expert list:</strong></td>
<td>1</td>
</tr>
<tr>
<td><strong>Min</strong></td>
<td>-</td>
<td><strong>Max</strong></td>
<td>-</td>
<td><strong>Factory setting</strong></td>
<td>1</td>
</tr>
</tbody>
</table>

**Description:**  
Sets the signal source for the command "enable speed controller" (r0898.12).  
0 signal: Set the I component and speed controller output to zero.  
1 signal: Enable speed controller.

**Dependency:**  
Refer to: r0898

**Note:**  
If "enable speed controller" is withdrawn, then an existing brake will be closed.  
If "speed controller enable" is withdrawn, the pulses are not suppressed.

**p0857**  
**Power unit monitoring time / PU t_monit**

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

<table>
<thead>
<tr>
<th>Can be changed:</th>
<th>T</th>
<th>Calculated:</th>
<th>-</th>
<th>Access level:</th>
<th>2</th>
</tr>
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<tbody>
<tr>
<td><strong>Data type:</strong></td>
<td>FloatingPoint32</td>
<td><strong>Dynamic index:</strong></td>
<td>-</td>
<td><strong>Func. diagram:</strong></td>
<td>8760, 8864, 8964</td>
</tr>
<tr>
<td><strong>P-Group:</strong></td>
<td>Commands</td>
<td><strong>Units group:</strong></td>
<td>-</td>
<td><strong>Unit selection:</strong></td>
<td>-</td>
</tr>
<tr>
<td><strong>Not for motor type:</strong></td>
<td>-</td>
<td><strong>Scaling:</strong></td>
<td>-</td>
<td><strong>Expert list:</strong></td>
<td>1</td>
</tr>
<tr>
<td><strong>Min</strong></td>
<td>100.0 [ms]</td>
<td><strong>Max</strong></td>
<td>60000.0 [ms]</td>
<td><strong>Factory setting</strong></td>
<td>60000.0 [ms]</td>
</tr>
</tbody>
</table>

**Description:**  
Sets the monitoring time for the power unit.  
The monitoring time is started after an 0/1 edge of the ON/OFF1 command. If the power unit does not return a READY signal within the monitoring time, then fault F06000 (infeeds) or F07802 (drives) is output.

**Dependency:**  
Refer to: F07802, F30027

**Notice:**  
The maximum time to pre-charge the DC link is monitored in the power unit and cannot be changed. The maximum duration of the pre-charging depends on the power class and the power unit design.  
The monitoring time for the pre-charging is started after the ON command (BI: p0840 = 0/1 signal). Fault F30027 is output when the maximum pre-charging duration is exceeded.

**Note:**  
The factory setting for p0857 depends on the power class and the design of the power unit.  
The monitoring time for the ready signal of the power unit includes the time to pre-charge the DC link and, if relevant, the de-bounce time of the contactors.  
If an excessively low value is entered into p0857, then after enable, this results in the corresponding fault.
**p0858 [0...n]**

**BI: Unconditionally close holding brake / Uncond close brake**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p0858</td>
<td>Sets the signal source for the command &quot;unconditionally close holding brake&quot;.</td>
<td>Refer to: p0855</td>
<td>The signal via BI: p0858 (unconditionally close holding brake) has a higher priority than via BI: p0855 (unconditionally open holding brake). For a 1 signal via BI: p0858, the command &quot;unconditionally close the holding brake&quot; is executed and internally a zero setpoint is entered.</td>
</tr>
</tbody>
</table>

**Data type:** Unsigned32 / Binary  
**Dynamic index:** CDS, p0170  
**Func. diagram:** 2501, 2701, 2707  
**Unit selection:** -  
**Expert list:** 1  
**Factory setting:** 9719.13

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>p0858</td>
<td>T</td>
<td>-</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>P-Group:</th>
<th>Units group:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>p0858</td>
<td>Commands</td>
<td>-</td>
<td>2</td>
</tr>
</tbody>
</table>

**Description:**

Sets the signal source for the command "unconditionally close holding brake".

**Dependency:**

Refer to: p0855

**Note:**

The signal via BI: p0858 (unconditionally close holding brake) has a higher priority than via BI: p0855 (unconditionally open holding brake).

For a 1 signal via BI: p0858, the command "unconditionally close the holding brake" is executed and internally a zero setpoint is entered.

**p0860**

**BI: Line cont. fdbk sig / Line contact feedb**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Recommend.</th>
<th>Dependency</th>
<th>Notice</th>
<th>Note</th>
</tr>
</thead>
</table>
| p0860    | Sets the signal source for the feedback signal from the line contactor. | When the monitoring is activated (BI: p0860 not equal to r0863.1), then to control the line contactor, signal BO: r0863.1 of its own drive object should be used. | Refer to: p0861, r0863  
Refer to: F07300 | The line contactor monitoring is de-activated if the control signal of the particular drive object is set as the signal source for the feedback signal of the line contactor (BI: p0860 = r0863.1). | The state of the line contactor is monitored depending on signal BO: r0863.1. 
When the monitoring is activated (BI: p0860 not equal to r0863.1), fault F07300 is then also output if the contactor is closed before it is controlled using r0863.1. |

**Data type:** Unsigned32 / Binary  
**Dynamic index:** -  
**Func. diagram:** 2634, 8734, 8834, 8934  
**Unit selection:** -  
**Expert list:** 1  
**Factory setting:** 863.1

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>p0860</td>
<td>T</td>
<td>-</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>P-Group:</th>
<th>Units group:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>p0860</td>
<td>Commands</td>
<td>-</td>
<td>3</td>
</tr>
</tbody>
</table>

**Description:**

Sets the signal source for the feedback signal from the line contactor.

**Recommend.:**

When the monitoring is activated (BI: p0860 not equal to r0863.1), then to control the line contactor, signal BO: r0863.1 of its own drive object should be used.

**Dependency:**

Refer to: p0861, r0863  
Refer to: F07300

**Notice:**

The line contactor monitoring is de-activated if the control signal of the particular drive object is set as the signal source for the feedback signal of the line contactor (BI: p0860 = r0863.1).

**Note:**

The state of the line contactor is monitored depending on signal BO: r0863.1. 
When the monitoring is activated (BI: p0860 not equal to r0863.1), fault F07300 is then also output if the contactor is closed before it is controlled using r0863.1.

**p0861**

**Line contactor monitoring time / LineContact t_mon**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
</table>
| p0861    | Sets the monitoring time of the line contactor. This time starts each time that the line contactor switches (r0863.1). If a feedback signal is not received from the line contactor within the time, a message is output. | Refer to: p0860, r0863  
Refer to: F07300 | The monitoring function is disabled for the factory setting of p0860. |

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>p0861</td>
<td>T</td>
<td>-</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>P-Group:</th>
<th>Units group:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>p0861</td>
<td>Commands</td>
<td>-</td>
<td>2</td>
</tr>
</tbody>
</table>

**Data type:** FloatingPoint32  
**Dynamic index:** -  
**Func. diagram:** 2634, 8734, 8834, 8934

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>p0861</td>
<td>T</td>
<td>-</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>P-Group:</th>
<th>Units group:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>p0861</td>
<td>Commands</td>
<td>-</td>
<td>2</td>
</tr>
</tbody>
</table>

**Description:**

Sets the monitoring time of the line contactor.

This time starts each time that the line contactor switches (r0863.1). If a feedback signal is not received from the line contactor within the time, a message is output.

**Dependency:**

Refer to: p0860, r0863  
Refer to: F07300

**Note:**

The monitoring function is disabled for the factory setting of p0860.
**Parameter**

**List of parameters**

---

### p0862 Power unit ON delay / PU t_on

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

**Can be changed:** T  
**Calculated:** -  
**Access level:** 3  
**Data type:** FloatingPoint32  
**Dynamic index:** -  
**Func. diagram:** 2610, 8732, 8832, 8932

- **Group:** Commands  
- **Units group:** -  
- **Unit selection:** -  
- **Expert list:** 1

**Description:** Sets the delay time for the control command of the power unit and a line contactor, if used.

**Note:** This means that it is possible to realize a shifted (delayed) pre-charging or power-on using a single ON command.

When the infeed units are active, before the line contactor is closed, an offset adjustment of the current measurement is carried out for a duration of 120 ms (p3491).

---

### r0863.0...2 CO/BO: Drive coupling status word/control word / CoupleZSW/STW

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

**Can be changed:** -  
**Calculated:** -  
**Access level:** 2  
**Data type:** Unsigned16  
**Dynamic index:** -  
**Func. diagram:** -

- **Group:** Commands  
- **Units group:** -  
- **Unit selection:** -  
- **Expert list:** 1

**Description:** Displays the status and control words of the drive coupling.

#### Bit field:

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Closed-loop control operation</td>
<td>Yes</td>
<td>No</td>
<td>2610, 6495, 8732, 8832, 8932, 9794</td>
</tr>
<tr>
<td>01</td>
<td>Energize contactor</td>
<td>Yes</td>
<td>No</td>
<td>2610, 2634, 8732, 8734, 8832, 8834, 8932, 8934</td>
</tr>
<tr>
<td>02</td>
<td>Infeed line supply failure</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
</tbody>
</table>

**Note:**

- Bit 00 signals that the infeed is ready.
- When the operating signal is transferred via BO: r0863.0 this allows several drives to start (run-up) staggered over time when they are simultaneously powered up.
- To realize this, the following connections/interconnections are required:
  - Drive 1: Internconnect BI: p0864 with BO: r0863.0 of the infeed
  - Drive 2: Internconnect BI: p0864 with BO: r0863.0 of drive 1
  - Drive 3: Internconnect BI: p0864 with BO: r0863.0 of drive 2, etc.
- The first drive only transfers the operating signal to the next drive after it has reached its ready condition.
- Re bit 01:
  - Bit 1 is used to control an external line contactor.
- Re bit 02:
  - This bit only signals line supply failure for Active Infeed (A_INF) and Smart Infeed (S_INF).
## List of parameters

### p0868  Power unit DC switch debounce time / PU DC sw t_deboun

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
<th>Can be changed: T</th>
<th>Calculated: -</th>
<th>Access level: 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type: FloatingPoint32</td>
<td>Dynamic index: -</td>
<td>Func. diagram: -</td>
<td></td>
</tr>
<tr>
<td>P-Group: Commands</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td>0 [ms]</td>
<td>65000 [ms]</td>
<td>65000 [ms]</td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Sets the debounce time for the DC circuit breaker for Motor Modules in "chassis" format.

**Note:** The following applies if p0868 = 65000 ms: The debounce time defined internally in the power unit's EEPROM is implemented.

### p0894  Parking pre-setting / Parking pre-set

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
<th>Can be changed: U, T</th>
<th>Calculated: -</th>
<th>Access level: 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type: Unsigned32</td>
<td>Dynamic index: -</td>
<td>Func. diagram: -</td>
<td></td>
</tr>
<tr>
<td>P-Group: Displays, signals</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td>-</td>
<td>-</td>
<td>0000 bin</td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Pre-setting for the "Parking axis" and "Parking encoder" function.

**Dependency:** Refer to: p0480, p0897

**Note:** Re bit 00:
If there is at least one BICO interconnection for "Parking axis" or "Parking encoder", this default setting is taken into consideration during power-up.

### r0896.0  BO: Parking axis, status word / Parking axis, ZSW

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
<th>Can be changed: -</th>
<th>Calculated: -</th>
<th>Access level: 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type: Unsigned8</td>
<td>Dynamic index: -</td>
<td>Func. diagram: -</td>
<td></td>
</tr>
<tr>
<td>P-Group: Displays, signals</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Displays the status word for the "parking axis" function.

**Dependency:** Refer to: p0897

### p0897  BI: Parking axis selection / Parking axis sel

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
<th>Can be changed: T</th>
<th>Calculated: -</th>
<th>Access level: 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type: Unsigned32 / Binary</td>
<td>Dynamic index: -</td>
<td>Func. diagram: -</td>
<td></td>
</tr>
<tr>
<td>P-Group: Displays, signals</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td>-</td>
<td>-</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Sets the signal source to select the "parking axis" function.

**Dependency:** BI: p0897 = 0 signal
The function "parking axis" is not selected.
BI: p0897 = 1 signal
The function "parking axis" is selected.
Refer to: r0896
Notice: The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

Note: After it has been selected the "parking axis" function only becomes active when the pulses are suppressed.

### r0898.0...15
**CO/BO: Control word drive object 1 / STW DO1**

**CU_S110-CAN,**
**CU_S110-DP,**
**CU_S110-PN**

**Description:** Displays the control word of drive object 1 (Control Unit).

**Bit field:**

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Synchronization signal SYN</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>01</td>
<td>Real time synchronization PING</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>07</td>
<td>Acknowledge fault</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>12</td>
<td>Master sign-of-life bit 0</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>13</td>
<td>Master sign-of-life bit 1</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>14</td>
<td>Master sign-of-life bit 2</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>15</td>
<td>Master sign-of-life bit 3</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
</tbody>
</table>

### r0898.0...14
**CO/BO: Control word sequence control / STW seq_ctrl**

**SERVO_S110-CAN,**
**SERVO_S110-DP,**
**SERVO_S110-PN**

**Description:** Displays the control word of the sequence control.

**Bit field:**

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>ON/OFF1</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>01</td>
<td>OC / OFF2</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>02</td>
<td>OC / OFF3</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>03</td>
<td>Operation enable</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>04</td>
<td>Ramp-function generator enable</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>05</td>
<td>Continue ramp-function generator</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>06</td>
<td>Speed setpoint enable</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>07</td>
<td>Command open brake</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>08</td>
<td>Jog 1</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>09</td>
<td>Jog 2</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>10</td>
<td>Master ctrl by PLC</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>12</td>
<td>Speed controller enable</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>13</td>
<td>Command close brake</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
</tbody>
</table>

### r0899.0...15
**CO/BO: Status word drive object 1 / ZSW DO1**

**CU_S110-CAN,**
**CU_S110-DP,**
**CU_S110-PN**

**Description:** Displays the status word from drive object 1 (Control Unit).

**Bit field:**

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>reserved</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>03</td>
<td>Fault present</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>07</td>
<td>Alarm present</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
</tbody>
</table>
## List of parameters

### Description:
Displays the status word of the sequence control.

### Bit field:

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Rdy for switch on</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>01</td>
<td>Ready</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>02</td>
<td>Operation enabled</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>03</td>
<td>Jog active</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>04</td>
<td>No coasting active</td>
<td>OFF2 inactive</td>
<td>OFF2 active</td>
<td>-</td>
</tr>
<tr>
<td>05</td>
<td>No Quick Stop active</td>
<td>OFF3 inactive</td>
<td>OFF3 active</td>
<td>-</td>
</tr>
<tr>
<td>06</td>
<td>Switching on inhibited active</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>07</td>
<td>Drive ready</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>08</td>
<td>Controller enable</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>09</td>
<td>Control request</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>11</td>
<td>Pulses enabled</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>12</td>
<td>Open holding brake</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>13</td>
<td>Command close holding brake</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>14</td>
<td>Pulse enable from the brake control</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>15</td>
<td>Setpoint enable from the brake control</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
</tbody>
</table>

### Note:
- Re bits 00, 01, 02, 04, 05, 06, 09:
  - For PROFIdrive, these signals are used for status word 1.
  - Re bit 13:
  - When the "Safe Brake Control" (SBC) is activated and selected, the brake is no longer controlled using this signal.
  - Re bit 14, 15:
  - These signals are only of significance when the "extended brake control" function module is activated (r0108.14 = 1).

### p0918  PROFIBUS address / PB address

#### Can be changed:
- T

#### Data type:
- Unsigned16

#### P-Group:
- Communications

#### Not for motor type:
- -

#### Description:
Displays or sets the PROFIBUS address for PROFIBUS interface on the Control Unit.

The address can be set as follows:
1) Using the DIP switch on the Control Unit.
   --> p0918 can then only be read and displays the selected address.
   --> A change only becomes effective after a POWER ON.
2) Using p0918
   --> Only if all of the DIP switches are set to ON or OFF.
   --> The address is saved in a non-volatile fashion using the function "copy from RAM to ROM".
   --> A change only becomes effective after a POWER ON.

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SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3
**Parameter**

**List of parameters**

**Note:**
Permissible PROFIBUS addresses: 1 ... 126
Address 126 is used for commissioning.
Every PROFIBUS address change only becomes effective after a POWER ON ON.

### p0922 IF1 PROFIdrive telegram selection / IF1 PD Telegr_sel

**CU_S110-DP, CU_S110-PN**

<table>
<thead>
<tr>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>C2(1), T</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>

**Data type:** Unsigned16

**P-Group:** Communications

**Units group:** -

**Not for motor type:** -

**Scaling:** -

**Min:**

<table>
<thead>
<tr>
<th>Value</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>390</td>
<td>999</td>
<td></td>
</tr>
<tr>
<td>391</td>
<td>999</td>
<td></td>
</tr>
<tr>
<td>392</td>
<td>999</td>
<td></td>
</tr>
<tr>
<td>393</td>
<td>999</td>
<td></td>
</tr>
<tr>
<td>394</td>
<td>999</td>
<td></td>
</tr>
<tr>
<td>999</td>
<td>999</td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Sets the send and receive telegram.

**Value:**

- 390: SIEMENS telegram 390, PZD-2/2
- 391: SIEMENS telegram 391, PZD-3/7
- 392: SIEMENS telegram 392, PZD-3/15
- 393: SIEMENS telegram 393, PZD-4/21
- 394: SIEMENS telegram 394, PZD-3/3
- 999: Free telegram configuration with BICO

**Dependency:** Refer to: p2038
Refer to: F01505, F01506

**Note:**
For p0922 = 100 ... 199, p2038 can no longer be changed. This means that for these telegrams, the "SIMODRIVE 611 universal" interface mode is set and cannot be changed.

If a value is not equal to 999, a telegram is set and the automatically set interconnections in the telegram are inhibited.

The inhibited interconnections can only be changed again after setting value 999.

### p0922 IF1 PROFIdrive telegram selection / IF1 PD Telegr_sel

**SERVO_S110-DP, SERVO_S110-PN**

<table>
<thead>
<tr>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>C2(1), T</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>

**Data type:** Unsigned16

**P-Group:** Communications

**Units group:** -

**Not for motor type:** -

**Scaling:** -

**Min:**

<table>
<thead>
<tr>
<th>Value</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>999</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>999</td>
<td></td>
</tr>
<tr>
<td>102</td>
<td>999</td>
<td></td>
</tr>
<tr>
<td>103</td>
<td>999</td>
<td></td>
</tr>
<tr>
<td>999</td>
<td>999</td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Sets the send and receive telegram.

**Value:**

- 1: Standard telegram 1, PZD-2/2
- 2: Standard telegram 2, PZD-4/4
- 3: Standard telegram 3, PZD-5/9
- 4: Standard telegram 4, PZD-6/14
- 102: SIEMENS telegram 102, PZD-6/10
- 103: SIEMENS telegram 103, PZD-7/15
- 999: Free telegram configuration with BICO

**Dependency:** Refer to: p2038
Refer to: F01505, F01506

### p0922 IF1 PROFIdrive telegram selection / IF1 PD Telegr_sel

**SERVO_S110-DP**

<table>
<thead>
<tr>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>C2(1), T</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>

**Data type:** Unsigned16

**P-Group:** Communications

**Units group:** -

**Not for motor type:** -

**Scaling:** -

**Min:**

<table>
<thead>
<tr>
<th>Value</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>999</td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Sets the send and receive telegram.

**Value:**

- 7: Standard telegram 7, PZD-2/2
- 9: Standard telegram 9, PZD-10/5
- 110: SIEMENS telegram 110, PZD-12/7
List of parameters

111: SIEMENS telegram 111, PZD-12/12
999: Free telegram configuration with BICO

Dependency:
Refer to: p2038
Refer to: F01505, F01506

Note:
For p0922 = 100 ... 199, p2038 is automatically set to 1 and p2038 can no longer be changed. This means that for these telegrams, the "SIMODRIVE 611 universal" interface mode is set and cannot be changed.

If a value is not equal to 999, a telegram is set and the automatically set interconnections in the telegram are inhibited.

The inhibited interconnections can only be changed again after setting value 999.

**p0922**
IF1 PROFIdrive telegram selection / IF1 PD Telegr_sel

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
<th>Access level</th>
<th>Func. diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-DP</td>
<td>Can be changed: C2(1), T</td>
<td>Sets the send and receive telegram.</td>
<td>1</td>
<td>1520, 2420, 2422, 2423, 2424</td>
</tr>
<tr>
<td>(Pos ctrl),</td>
<td>Data type: Unsigned16</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-PN</td>
<td>P-Group: Communications</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Pos ctrl)</td>
<td>Units group: -</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not for motor type: -</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Min</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Max</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Factory setting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>999</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>999</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Dependency:
Refer to: p2038
Refer to: F01505, F01506

Note:
For p0922 = 100 ... 199, p2038 is automatically set to 1 and p2038 can no longer be changed. This means that for these telegrams, the "SIMODRIVE 611 universal" interface mode is set and cannot be changed.

If a value is not equal to 999, a telegram is set and the automatically set interconnections in the telegram are inhibited.

The inhibited interconnections can only be changed again after setting value 999.

**r0924[0...1]**
ZSW bit pulses enabled / ZSW pulse enab

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
<th>Access level</th>
<th>Func. diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN,</td>
<td>Can be changed: -</td>
<td>Displays the position of the &quot;Pulses enabled&quot; status signal in the PROFIdrive telegram.</td>
<td>3</td>
<td>2454, 2456</td>
</tr>
<tr>
<td>SERVO_S110-DP,</td>
<td>Data type: Unsigned16</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-PN</td>
<td>P-Group: Communications</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Units group: -</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not for motor type: -</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Min</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Max</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Factory setting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>999</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Dependency:
Refer to: p2038
Refer to: F01505, F01506

Note:
For p0922 = 100 ... 199, p2038 is automatically set to 1 and p2038 can no longer be changed. This means that for these telegrams, the "SIMODRIVE 611 universal" interface mode is set and cannot be changed.

If a value is not equal to 999, a telegram is set and the automatically set interconnections in the telegram are inhibited.

The inhibited interconnections can only be changed again after setting value 999.

**p0925**
PROFIdrive clock synchronous sign-of-life tolerance / PD SoL_tol

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
<th>Access level</th>
<th>Func. diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>CU_S110-DP,</td>
<td>Can be changed: U, T</td>
<td>Sets the number of tolerated consecutive sign-of-life errors of the clock-cycle synchronous master.</td>
<td>3</td>
<td>2410</td>
</tr>
<tr>
<td>CU_S110-PN,</td>
<td>Data type: Unsigned16</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-DP,</td>
<td>P-Group: Communications</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-PN</td>
<td>Units group: -</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not for motor type: -</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Min</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Max</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Factory setting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>65535</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Dependency:
Refer to: p2045, r2065
Refer to: F01912

Note:
The sign-of-life monitoring is disabled for p0925 = 65535.
**Parameter**

**List of parameters**

---

### r0930
PROFdrive operating mode / PD operating mode

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Can be changed: -</td>
</tr>
<tr>
<td>Data type: Unsigned16</td>
<td>Calculated: -</td>
</tr>
<tr>
<td>P-Group: Setpoints</td>
<td>Access level: 3</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Dynamic index: -</td>
</tr>
<tr>
<td>Min</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Max</td>
<td>Unit: -</td>
</tr>
</tbody>
</table>

**Description:** Displays the operating mode.

1: Closed-loop speed controlled operation with ramp-function generator
2: Closed-loop position controlled operation
3: Closed-loop speed controlled operation without ramp-function generator

---

### r0944
CO: Counter for fault buffer changes / Fault buff change

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>All objects</td>
<td>Can be changed: -</td>
</tr>
<tr>
<td>Data type: Unsigned16</td>
<td>Calculated: -</td>
</tr>
<tr>
<td>P-Group: Messages</td>
<td>Access level: 2</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Dynamic index: -</td>
</tr>
<tr>
<td>Min</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Max</td>
<td>Expert list: 1</td>
</tr>
</tbody>
</table>

**Description:** Displays fault buffer changes. This counter is incremented every time the fault buffer changes.

**Recommend.:** Used to check whether the fault buffer has been read out consistently.

**Dependency:** Refer to: r0945, r0947, r0948, r0949, r2109

---

### r0945[0...63]
Fault code / Fault code

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>All objects</td>
<td>Can be changed: -</td>
</tr>
<tr>
<td>Data type: Unsigned16</td>
<td>Calculated: -</td>
</tr>
<tr>
<td>P-Group: Messages</td>
<td>Access level: 2</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Dynamic index: -</td>
</tr>
<tr>
<td>Min</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Max</td>
<td>Expert list: 1</td>
</tr>
</tbody>
</table>

**Description:** Displays the numbers of faults that have occurred.

**Dependency:** Refer to: r0947, r0948, r0949, r2109, r2130, r2133, r3120, r3122

**Note:** The buffer parameters are cyclically updated in the background (refer to status signal in r2139).

Fault buffer structure (general principle):
r0945[0], r0949[0], r0948[0], r2109[0], r3115[0] --> actual fault case, fault 1
r0945[1], r0945[63], r0948[15], r0949[15] --> actual fault case, fault 8
r0945[7], r0949[7], r0948[7], r2109[7], r3115[7] --> 1st acknowledged fault case, fault 1
r0945[8], r0949[8], r0948[8], r2109[8], r3115[8] --> 1st acknowledged fault case, fault 8
r0945[15], r0949[15], r0948[15], r2109[15], r3115[15] --> 7th acknowledged fault case, fault 1
r0945[56], r0949[56], r0948[56], r2109[56], r3115[56] --> 7th acknowledged fault case, fault 8
### List of parameters

#### r0946[0...65534] Fault code list / Fault code list

<table>
<thead>
<tr>
<th>Description</th>
<th>Lists the fault codes stored in the drive unit. The indices can only be accessed with a valid fault code.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependency</td>
<td>The parameter assigned to the fault code is entered in r0951 under the same index.</td>
</tr>
</tbody>
</table>

#### r0947[0...63] Fault number / Fault number

<table>
<thead>
<tr>
<th>Description</th>
<th>This parameter is identical to r0945.</th>
</tr>
</thead>
</table>

#### r0948[0...63] Fault time received in milliseconds / t_fault recv ms

<table>
<thead>
<tr>
<th>Description</th>
<th>Displays the system runtime in milliseconds when the fault occurred.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependency</td>
<td>Refer to: r0945, r0947, r0949, r2109, r2114, r2130, r2133, r3115, r3120, r3122</td>
</tr>
<tr>
<td>Notice</td>
<td>The time comprises r2130 (days) and r0948 (milliseconds).</td>
</tr>
<tr>
<td>Note</td>
<td>The buffer parameters are cyclically updated in the background (refer to status signal in r2139). The structure of the fault buffer and the assignment of the indices is shown in r0945. When the parameter is read via PROFINet, the TimeDifference data type applies.</td>
</tr>
</tbody>
</table>

#### r0949[0...63] Fault value / Fault value

<table>
<thead>
<tr>
<th>Description</th>
<th>Displays additional information about the fault that occurred (as integer number).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependency</td>
<td>Refer to: r0945, r0947, r0948, r2109, r2130, r2133, r3115, r3120, r3122</td>
</tr>
<tr>
<td>Note</td>
<td>The buffer parameters are cyclically updated in the background (refer to status signal in r2139). The structure of the fault buffer and the assignment of the indices is shown in r0945.</td>
</tr>
</tbody>
</table>
### p0952 Fault cases, counter / Fault cases qty

<table>
<thead>
<tr>
<th>All objects</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>U, T</td>
<td></td>
<td>-</td>
<td>3</td>
</tr>
</tbody>
</table>

**Data type:** Unsigned16  
**P-Group:** Messages  
**Not for motor type:**  
**Min** | **Max**  
0 | 65535  

**Dependency:** Number of fault situations that have occurred since the last reset.  
**Description:** The fault buffer is deleted (cleared) by setting p0952 to 0.  
**Refer to:** r0945, r0947, r0948, r0949, r2109, r2130, r2133, r2136

### r0963 PROFIBUS baud rate / PB baud rate

**CU_S110-DP**  
**Can be changed:** -  
**Data type:** Unsigned16  
**P-Group:** Communications  
**Not for motor type:**  
**Min** | **Max**  
0 | 255  

**Description:** Displays the corresponding value for the PROFIBUS baud rate.  
**Value:**  
0: 9.6 kbit/s  
1: 19.2 kbit/s  
2: 93.75 kbit/s  
3: 187.5 kbit/s  
4: 500 kbit/s  
6: 1.5 Mbit/s  
7: 3 Mbit/s  
8: 6 Mbit/s  
9: 12 Mbit/s  
10: 31.25 kbit/s  
11: 45.45 kbit/s  
255: Baud rate unknown

### r0964[0...6] Device identification / Device ident.

**CU_S110-CAN,**  
**CU_S110-DP,**  
**CU_S110-PN**  
**Can be changed:** -  
**Data type:** Unsigned16  
**P-Group:** Communications  
**Not for motor type:**  
**Min** | **Max**  
- | -  

**Description:** Displays the device identification.  
**Index:**  
[0] = Company (Siemens = 42)  
[1] = Device type  
[2] = Firmware version  
[3] = Firmware date (year)  
[4] = Firmware date (day/month)  
[5] = Number of drive objects  

**Note:**  
Example:  
r0964[0] = 42 --> SIEMENS  
r0964[1] = device type, see below  
r0964[2] = 403 --> first part of the firmware version V04.03 (for second part, refer to index 6)  
r0964[3] = 2010 --> year 2010  
r0964[4] = 1705 --> 17th of May  
r0964[5] = 2 --> 2 drive objects  
r0964[6] = 200 --> second part, firmware version (complete version: V04.03.02.00)
### List of parameters

#### Device type:
- `r0964[1] = 5400 --> SINAMICS S110 CU305 DP`  
- `r0964[1] = 5401 --> SINAMICS S110 CU305 PN`  
- `r0964[1] = 5402 --> SINAMICS S110 CU305 CAN`

#### r0965
**PROFIdrive profile number / PD profile number**

<table>
<thead>
<tr>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
<th>Func. diagram:</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>3</td>
<td>-</td>
</tr>
</tbody>
</table>

**Data type:** Unsigned16  
**P-Group:** Communications  
**Not for motor type:** -  
**Min:** -  
**Max:** -  
**Factory setting:**

**Description:** Displays the PROFIdrive profile number and profile version.  
Constant value = 0329 hex.  
Byte 1: Profile number = 03 hex = PROFIdrive profile  
Byte 2: Profile version = 29 hex = Version 4.1

**Note:**  
When the parameter is read via PROFIdrive, the Octet String 2 data type applies.

#### p0969
**System runtime relative / t_System relative**

<table>
<thead>
<tr>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
<th>Func. diagram:</th>
</tr>
</thead>
<tbody>
<tr>
<td>T</td>
<td>-</td>
<td>3</td>
<td>1750, 8060</td>
</tr>
</tbody>
</table>

**Data type:** Unsigned32  
**P-Group:** Displays, signals  
**Not for motor type:** -  
**Min:** 0 [ms]  
**Max:** 4294967295 [ms]  
**Factory setting:** 0 [ms]

**Description:** Displays the system runtime in ms since the last POWER ON.  
The value overflows after approx. 49 days.  
When the parameter is read via PROFIdrive, the TimeDifference data type applies.

#### p0970
**Reset drive parameters / Drive par reset**

<table>
<thead>
<tr>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
<th>Func. diagram:</th>
</tr>
</thead>
<tbody>
<tr>
<td>C2(30)</td>
<td>-</td>
<td>2</td>
<td>-</td>
</tr>
</tbody>
</table>

**Data type:** Unsigned16  
**P-Group:** Factory settings  
**Not for motor type:** -  
**Min:** 0  
**Max:** 100  
**Factory setting:** 0

**Description:** The parameter is used to initiate the reset of the parameters of an individual drive unit.  
Parameters p0100, p0205 (only for VECTOR) and the parameters of the basic drive commissioning (p0009) are not reset (p0107, p0108, p0111, p0112, p0115, p0121, p0130, p0131, p0140, p0141, p0142, p0170, p0186 ... p0189).  
These can only be reset using the factory setting of the complete drive unit (p0976).  

**Value:**  
0: Inactive  
1: Start a parameter reset  
5: Starts a safety parameter reset  
100: Start a BICO interconnection reset  

**Dependency:** Refer to: F01659

**Notice:** After the value has been modified, no further parameter modifications can be made and the status is shown in r3996. Modifications can be made again when r3996 = 0.

**Note:** A factory setting run can only be started if p0010 was first set to 30 (parameter reset).  
At the end of the calculations, p0970 is automatically set to 0.  
Parameter reset has been completed if p0970 and p0010 have been set to 0.
Parameter
List of parameters

For p0970 = 5 the following applies:
The password for Safety Integrated must be set.
When Safety Integrated is enabled, this can result in error messages, which then require an acceptance test to be performed.
Then save the parameters and carry out a POWER ON.
For p0970 = 1 the following applies:
If a Safety Integrated function is parameterized (p9601), then the safety parameters are not reset. In this case, a fault F01659 is output with fault value 2.

p0971 Save drive object parameters / Drv_obj par save
All objects
Can be changed: U, T
Data type: Unsigned16
P-Group: Factory settings
Not for motor type: -
Min
Max
0
1
Access level: 1
Calculated: -
Dynamic index: -
Units group: -
Scaling: -
Expert list: 1
Factory setting
Description: Setting to save the parameter of the particular drive object in the non-volatile memory.
Value:
0: Inactive
1: Save drive object
Dependency:
Refer to: p0977, p1960
Caution:
If a memory card (optional) is inserted, the following applies:
The parameters are also saved on the card and therefore overwrite any existing data!

Caution: The Control Unit power supply may only be powered down after data has been saved (i.e. after data save has been started, wait until the parameter again has the value 0).
Notice: Writing to parameters is inhibited while saving.
The progress while saving is displayed in r3996.
Note:
Starting from the particular drive object, the following parameters are saved:
CU3xx: Device-specific parameters and PROFIBUS device parameters.
Other objects: Parameters of the actual object and PROFIBUS device parameters.
Prerequisite:
In order that the parameter of a drive object, saved with p0971 = 1, is read the next time that the Control Unit is booted, then all parameters must, as a minimum, have first been saved once with p0977 = 1.

p0972 Drive unit reset / Drv_unit reset
CU_S110-CAN,
CU_S110-DP,
CU_S110-PN
Can be changed: U, T
Data type: Unsigned16
P-Group: -
Not for motor type: -
Min
Max
0
3
Access level: 1
Calculated: -
Dynamic index: -
Units group: -
Scaling: -
Expert list: 1
Factory setting
Description: Sets the required procedure to execute a hardware reset for the drive unit.
Value:
0: Inactive
1: Hardware-Reset immediate
2: Hardware reset preparation
3: Hardware reset after cyclic communication has failed
Danger:
The memory card/device memory of the Control Unit must not be accessed.
Note:
If value = 1:
Reset is immediately executed and communications interrupted.
After communications have been established, check the reset operation (refer below).
If value = 2:
Help to check the reset operation.
Firstly, set p0972 = 2 and then read back. Secondly, set p0972 = 1 (it is possible that this request is possibly no longer acknowledged). The communication is then interrupted.
After communications have been established, check the reset operation (refer below).
If value = 3:
The reset is executed after interrupting cyclic communication. This setting is used to implement a synchronized reset by a control for several drive units.
If the cyclic communication is active for both PROFIdrive interfaces, then the reset is executed after completing both cycle communications.
After communications have been established, check the reset operation (refer below).
To check the reset operation:
After the drive unit has been restarted and communications have been established, read p0972 and check the following:
p0972 = 0? --> The reset was successfully executed.
p0972 > 0? --> The reset was not executed.

<table>
<thead>
<tr>
<th>r0975[0...10]</th>
<th>Drive object identification / DO identification</th>
</tr>
</thead>
<tbody>
<tr>
<td>All objects</td>
<td></td>
</tr>
<tr>
<td>Can be changed</td>
<td>-</td>
</tr>
<tr>
<td>Calculated:</td>
<td>-</td>
</tr>
<tr>
<td>Access level:</td>
<td>2</td>
</tr>
<tr>
<td>Data type:</td>
<td>Unsigned16</td>
</tr>
<tr>
<td>Dynamic index:</td>
<td>-</td>
</tr>
<tr>
<td>Func. diagram:</td>
<td>-</td>
</tr>
<tr>
<td>P-Group:</td>
<td>Communications</td>
</tr>
<tr>
<td>Units group:</td>
<td>-</td>
</tr>
<tr>
<td>Unit selection:</td>
<td>-</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
</tr>
<tr>
<td>Scaling:</td>
<td>-</td>
</tr>
<tr>
<td>Expert list:</td>
<td>1</td>
</tr>
<tr>
<td>Min</td>
<td>-</td>
</tr>
<tr>
<td>Max</td>
<td>-</td>
</tr>
<tr>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td>Description:</td>
<td>Displays the identification of the drive object.</td>
</tr>
<tr>
<td>Index:</td>
<td></td>
</tr>
<tr>
<td>[0] = Company (Siemens = 42)</td>
<td></td>
</tr>
<tr>
<td>[1] = Drive object type</td>
<td></td>
</tr>
<tr>
<td>[2] = Firmware version</td>
<td></td>
</tr>
<tr>
<td>[3] = Firmware date (year)</td>
<td></td>
</tr>
<tr>
<td>[4] = Firmware date (day/month)</td>
<td></td>
</tr>
<tr>
<td>[5] = PROFIdrive drive object, type class</td>
<td></td>
</tr>
<tr>
<td>[6] = PROFIdrive drive object, sub-type Class 1</td>
<td></td>
</tr>
<tr>
<td>[7] = Drive object number</td>
<td></td>
</tr>
<tr>
<td>[8] = Reserved</td>
<td></td>
</tr>
<tr>
<td>[9] = Reserved</td>
<td></td>
</tr>
<tr>
<td>[10] = Firmware patch/hot fix</td>
<td></td>
</tr>
</tbody>
</table>

Note:
Example:
r0975[0] = 42 --> SIEMENS
r0975[1] = 11 --> SERVO drive object type
r0975[2] = 102 --> first part, firmware version V01.02 (second part, refer to index 10)
r0975[4] = 1401 --> 14th of January
r0975[5] = 1 --> PROFIdrive drive object, type class
r0975[6] = 9 --> PROFIdrive drive object sub-type class 1
r0975[7] = 2 --> drive object number = 2
r0975[8] = 0 (reserved)
r0975[9] = 0 (reserved)
r0975[10] = 600 --> second part, firmware version (complete version: V01.02.06.00)
### p0976 - Reset and load all parameters / Reset load all par

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Access level</th>
</tr>
</thead>
<tbody>
<tr>
<td>p0976</td>
<td>Reset or downloads all parameters of the drive system.</td>
<td>0: Inactive 1: Start reset of all parameters to factory setting 2: Start download of param. saved in non-volatile mem w/ p0977=1 3: Start download of volatile parameters from RAM 10: Start download of param. saved in non-volatile mem w/ p0977=10 11: Start download of param. saved in non-volatile mem w/ p0977=11 12: Start download of param. saved in non-volatile mem w/ p0977=12 20: Start download Siemens internal setting 20 21: Start download Siemens internal setting 21 22: Start download Siemens internal setting 22 23: Start download Siemens internal setting 23 24: Start download Siemens internal setting 24 25: Start download Siemens internal setting 25 26: Start download Siemens internal setting 26 100: Start resetting of all BICO interconnections 1011: Start download of param. saved in volatile mem w/ p0977=1011 1012: Start download of param. saved in volatile mem w/ p0977=1012 1013: Start download of param. saved in volatile mem w/ p0977=1013</td>
<td>0 1013</td>
</tr>
</tbody>
</table>

#### Notice
After the value has been modified, no further parameter modifications can be made and the status is shown in r3996. Modifications can be made again when r3996 = 0.

#### Note
After all of the parameters have been reset to their factory setting, the system must be commissioned for the first time again.

Resetting or loading is realized in the non-volatile memory.

Procedure:
1. Set p0009 = 30 (parameter reset).
2. Set p0976 to "required value". The system is rebooted.

p0976 is automatically set to 0 and p0009 is automatically set to 1 after this has been carried out.

### p0977 - Save all parameters / Save all par

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Access level</th>
</tr>
</thead>
<tbody>
<tr>
<td>p0977</td>
<td>Saves all parameters of the drive system to the non-volatile memory.</td>
<td>0: Inactive 1: Save in non-volatile memory - downloaded at POWER ON 10: Save as opt. in non-vol. memory - downloaded w/ p0976=10 11: Save as opt. in non-vol. memory - downloaded w/ p0976=11 12: Save as opt. in non-vol. memory - downloaded w/ p0976=12 20: Save in non-volatile memory as setting 20 (reserved) 21: Save in non-volatile memory as setting 21 (reserved) 22: Save in non-volatile memory as setting 22 (reserved) 23: Save in non-volatile memory as setting 23 (reserved) 24: Save in non-volatile memory as setting 24 (reserved) 25: Save in non-volatile memory as setting 25 (reserved) 26: Save in non-volatile memory as setting 26 (reserved) 80: Save in non-volatile memory time-optimized (reserved)</td>
<td>0 1013</td>
</tr>
</tbody>
</table>
1011: Save in volatile memory, downloaded with p0976=1011
1012: Save in volatile memory, downloaded with p0976=1012
1013: Save in volatile memory, downloaded with p0976=1013

Dependency:
Refer to: p0976, p1960

Caution:
Memory card inserted:
The drive parameterization is also saved on the card. Any backed-up data is overwritten!!!

Caution:
The Control Unit power supply may only be powered down after data has been saved (i.e. after data save has been started, wait until the parameter again has the value 0).

Notice:
Writing to parameters is inhibited while saving.
The progress while saving is displayed in r3996.

Note:
Parameters saved with p0977 = 10, 11 or 12 can be downloaded again with p0976 = 10, 11 or 12.

---

**r0979[0...30]**  
PROFIdrive encoder format / PD encoder format

SERVO_S110-CAN,  
SERVO_S110-DP,  
SERVO_S110-PN

<table>
<thead>
<tr>
<th>Index</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>[0] = Header</td>
<td>Displays the actual position encoder used according to PROFIdrive.</td>
</tr>
<tr>
<td>[1] = Type, encoder 1</td>
<td></td>
</tr>
<tr>
<td>[2] = Resolution enc 1</td>
<td></td>
</tr>
<tr>
<td>[3] = Shift factor G1_XIST1</td>
<td></td>
</tr>
<tr>
<td>[4] = Shift factor G1_XIST2</td>
<td></td>
</tr>
<tr>
<td>[5] = Distinguishable revolutions encoder 1</td>
<td></td>
</tr>
<tr>
<td>[6] = Reserved</td>
<td></td>
</tr>
<tr>
<td>[7] = Reserved</td>
<td></td>
</tr>
<tr>
<td>[8] = Reserved</td>
<td></td>
</tr>
<tr>
<td>[9] = Reserved</td>
<td></td>
</tr>
<tr>
<td>[10] = Reserved</td>
<td></td>
</tr>
<tr>
<td>[11] = Type, encoder 2</td>
<td></td>
</tr>
<tr>
<td>[12] = Resolution enc 2</td>
<td></td>
</tr>
<tr>
<td>[13] = Shift factor G2_XIST1</td>
<td></td>
</tr>
<tr>
<td>[14] = Shift factor G2_XIST2</td>
<td></td>
</tr>
<tr>
<td>[15] = Distinguishable revolutions encoder 2</td>
<td></td>
</tr>
<tr>
<td>[16] = Reserved</td>
<td></td>
</tr>
<tr>
<td>[17] = Reserved</td>
<td></td>
</tr>
<tr>
<td>[18] = Reserved</td>
<td></td>
</tr>
<tr>
<td>[19] = Reserved</td>
<td></td>
</tr>
<tr>
<td>[20] = Reserved</td>
<td></td>
</tr>
<tr>
<td>[21] = Reserved</td>
<td></td>
</tr>
<tr>
<td>[22] = Reserved</td>
<td></td>
</tr>
<tr>
<td>[23] = Reserved</td>
<td></td>
</tr>
<tr>
<td>[24] = Reserved</td>
<td></td>
</tr>
<tr>
<td>[25] = Reserved</td>
<td></td>
</tr>
<tr>
<td>[26] = Reserved</td>
<td></td>
</tr>
<tr>
<td>[27] = Reserved</td>
<td></td>
</tr>
<tr>
<td>[28] = Reserved</td>
<td></td>
</tr>
<tr>
<td>[29] = Reserved</td>
<td></td>
</tr>
<tr>
<td>[30] = Reserved</td>
<td></td>
</tr>
</tbody>
</table>

Note:
Information about the individual indices can be taken from the following literature:
PROFIdrive Profile Drive Technology
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>r0980[0...299]</td>
<td>List of existing parameters 1 / List avail par 1</td>
<td>Displays the parameters that exist for this drive.</td>
<td>The existing parameters are displayed in indices 0 to 298. If an index contains the value 0, then the list ends here. In a long list, index 299 contains the parameter number at which position the list continues. This list consists solely of the following parameters: r0980[0...299], r0981[0...299] ... r0989[0...299] The parameters in this list are not displayed in the expert list of the commissioning software. However, they can be read from a higher-level control system (e.g. PROFIBUS master).</td>
</tr>
<tr>
<td>r0981[0...299]</td>
<td>List of existing parameters 2 / List avail par 2</td>
<td>Displays the parameters that exist for this drive.</td>
<td>The existing parameters are displayed in indices 0 to 298. If an index contains the value 0, then the list ends here. In a long list, index 299 contains the parameter number at which position the list continues. This list consists solely of the following parameters: r0980[0...299], r0981[0...299] ... r0989[0...299] The parameters in this list are not displayed in the expert list of the commissioning software. However, they can be read from a higher-level control system (e.g. PROFIBUS master).</td>
</tr>
<tr>
<td>r0989[0...299]</td>
<td>List of existing parameters 10 / List avail par 10</td>
<td>Displays the parameters that exist for this drive.</td>
<td>The existing parameters are displayed in indices 0 to 298. If an index contains the value 0, then the list ends here. In a long list, index 299 contains the parameter number at which position the list continues. This list consists solely of the following parameters: r0980[0...299], r0981[0...299] ... r0989[0...299] The parameters in this list are not displayed in the expert list of the commissioning software. However, they can be read from a higher-level control system (e.g. PROFIBUS master).</td>
</tr>
<tr>
<td>Parameter</td>
<td>Description</td>
<td>Dependency</td>
<td>Notice</td>
</tr>
<tr>
<td>-----------</td>
<td>-------------</td>
<td>------------</td>
<td>--------</td>
</tr>
<tr>
<td>p1001[0...n] CO: Fixed speed setpoint 1 / n_set_fixed 1</td>
<td>Sets a value for the fixed speed / velocity setpoint 1.</td>
<td>Refer to: p1020, p1021, p1022, p1023, r1024, r1197</td>
<td>A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.</td>
</tr>
<tr>
<td>Can be changed: U, T</td>
<td>Can be changed: U, T</td>
<td>Calculated: -</td>
<td>Access level: 2</td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td>Data type: FloatingPoint32</td>
<td>Calculated: -</td>
<td>Access level: 2</td>
</tr>
<tr>
<td>P-Group: Setpoints</td>
<td>P-Group: Setpoints</td>
<td>Calculated: -</td>
<td>Access level: 2</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Not for motor type: -</td>
<td>Calculated: -</td>
<td>Access level: 2</td>
</tr>
<tr>
<td>Notice:</td>
<td>Notice:</td>
<td>Notice:</td>
<td>Notice:</td>
</tr>
<tr>
<td>p1002[0...n] CO: Fixed speed setpoint 2 / n_set_fixed 2</td>
<td>Sets a value for the fixed speed / velocity setpoint 2.</td>
<td>Refer to: p1020, p1021, p1022, p1023, r1024, r1197</td>
<td>A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.</td>
</tr>
<tr>
<td>Can be changed: U, T</td>
<td>Can be changed: U, T</td>
<td>Calculated: -</td>
<td>Access level: 2</td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td>Data type: FloatingPoint32</td>
<td>Calculated: -</td>
<td>Access level: 2</td>
</tr>
<tr>
<td>P-Group: Setpoints</td>
<td>P-Group: Setpoints</td>
<td>Calculated: -</td>
<td>Access level: 2</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Not for motor type: -</td>
<td>Calculated: -</td>
<td>Access level: 2</td>
</tr>
<tr>
<td>Notice:</td>
<td>Notice:</td>
<td>Notice:</td>
<td>Notice:</td>
</tr>
<tr>
<td>p1003[0...n] CO: Fixed speed setpoint 3 / n_set_fixed 3</td>
<td>Sets a value for the fixed speed / velocity setpoint 3.</td>
<td>Refer to: p1020, p1021, p1022, p1023, r1024, r1197</td>
<td>A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.</td>
</tr>
<tr>
<td>Can be changed: U, T</td>
<td>Can be changed: U, T</td>
<td>Calculated: -</td>
<td>Access level: 2</td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td>Data type: FloatingPoint32</td>
<td>Calculated: -</td>
<td>Access level: 2</td>
</tr>
<tr>
<td>P-Group: Setpoints</td>
<td>P-Group: Setpoints</td>
<td>Calculated: -</td>
<td>Access level: 2</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Not for motor type: -</td>
<td>Calculated: -</td>
<td>Access level: 2</td>
</tr>
<tr>
<td>Notice:</td>
<td>Notice:</td>
<td>Notice:</td>
<td>Notice:</td>
</tr>
<tr>
<td>p1004[0...n] CO: Fixed speed setpoint 4 / n_set_fixed 4</td>
<td>Sets a value for the fixed speed / velocity setpoint 4.</td>
<td>Refer to: p1020, p1021, p1022, p1023, r1024, r1197</td>
<td>A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.</td>
</tr>
<tr>
<td>Can be changed: U, T</td>
<td>Can be changed: U, T</td>
<td>Calculated: -</td>
<td>Access level: 2</td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td>Data type: FloatingPoint32</td>
<td>Calculated: -</td>
<td>Access level: 2</td>
</tr>
<tr>
<td>P-Group: Setpoints</td>
<td>P-Group: Setpoints</td>
<td>Calculated: -</td>
<td>Access level: 2</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Not for motor type: -</td>
<td>Calculated: -</td>
<td>Access level: 2</td>
</tr>
<tr>
<td>Parameter</td>
<td>CO: Fixed speed setpoint 5 / n_set_fixed 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-CAN</td>
<td>Can be changed: U, T</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-DP</td>
<td>Data type: FloatingPoint32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-PN</td>
<td>P-Group: Setpoints</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Extended set)</td>
<td>Not for motor type: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Extended set)</td>
<td>Dynamic index: DDS, p0180</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Extended set)</td>
<td>Units group: 3_1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Extended set)</td>
<td>Scaling: p2000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Extended set)</td>
<td>Expert list: 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>-210000.000 [rpm]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max</td>
<td>210000.000 [rpm]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factory setting</td>
<td>0.000 [rpm]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Description:</td>
<td>Sets a value for the fixed speed / velocity setpoint 5.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dependency:</td>
<td>Refer to: p1020, p1021, p1022, p1023, r1024, r1197</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Notice:</td>
<td>A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>CO: Fixed speed setpoint 6 / n_set_fixed 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN</td>
<td>Can be changed: U, T</td>
</tr>
<tr>
<td>SERVO_S110-DP</td>
<td>Data type: FloatingPoint32</td>
</tr>
<tr>
<td>SERVO_S110-PN</td>
<td>P-Group: Setpoints</td>
</tr>
<tr>
<td>(Extended set)</td>
<td>Not for motor type: -</td>
</tr>
<tr>
<td>(Extended set)</td>
<td>Dynamic index: DDS, p0180</td>
</tr>
<tr>
<td>(Extended set)</td>
<td>Units group: 3_1</td>
</tr>
<tr>
<td>(Extended set)</td>
<td>Scaling: p2000</td>
</tr>
<tr>
<td>(Extended set)</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
<td>-210000.000 [rpm]</td>
</tr>
<tr>
<td>Max</td>
<td>210000.000 [rpm]</td>
</tr>
<tr>
<td>Factory setting</td>
<td>0.000 [rpm]</td>
</tr>
<tr>
<td>Description:</td>
<td>Sets a value for the fixed speed / velocity setpoint 6.</td>
</tr>
<tr>
<td>Dependency:</td>
<td>Refer to: p1020, p1021, p1022, p1023, r1024, r1197</td>
</tr>
<tr>
<td>Notice:</td>
<td>A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>CO: Fixed speed setpoint 7 / n_set_fixed 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN</td>
<td>Can be changed: U, T</td>
</tr>
<tr>
<td>SERVO_S110-DP</td>
<td>Data type: FloatingPoint32</td>
</tr>
<tr>
<td>SERVO_S110-PN</td>
<td>P-Group: Setpoints</td>
</tr>
<tr>
<td>(Extended set)</td>
<td>Not for motor type: -</td>
</tr>
<tr>
<td>(Extended set)</td>
<td>Dynamic index: DDS, p0180</td>
</tr>
<tr>
<td>(Extended set)</td>
<td>Units group: 3_1</td>
</tr>
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<td>(Extended set)</td>
<td>Scaling: p2000</td>
</tr>
<tr>
<td>(Extended set)</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
<td>-210000.000 [rpm]</td>
</tr>
<tr>
<td>Max</td>
<td>210000.000 [rpm]</td>
</tr>
<tr>
<td>Factory setting</td>
<td>0.000 [rpm]</td>
</tr>
<tr>
<td>Description:</td>
<td>Sets a value for the fixed speed / velocity setpoint 7.</td>
</tr>
<tr>
<td>Dependency:</td>
<td>Refer to: p1020, p1021, p1022, p1023, r1024, r1197</td>
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<tr>
<td>Notice:</td>
<td>A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.</td>
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<table>
<thead>
<tr>
<th>Parameter</th>
<th>CO: Fixed speed setpoint 8 / n_set_fixed 8</th>
</tr>
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<tbody>
<tr>
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<tr>
<td>SERVO_S110-DP</td>
<td>Data type: FloatingPoint32</td>
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<tr>
<td>SERVO_S110-PN</td>
<td>P-Group: Setpoints</td>
</tr>
<tr>
<td>(Extended set)</td>
<td>Not for motor type: -</td>
</tr>
<tr>
<td>(Extended set)</td>
<td>Dynamic index: DDS, p0180</td>
</tr>
<tr>
<td>(Extended set)</td>
<td>Units group: 3_1</td>
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<tr>
<td>(Extended set)</td>
<td>Scaling: p2000</td>
</tr>
<tr>
<td>(Extended set)</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
<td>-210000.000 [rpm]</td>
</tr>
<tr>
<td>Max</td>
<td>210000.000 [rpm]</td>
</tr>
<tr>
<td>Factory setting</td>
<td>0.000 [rpm]</td>
</tr>
<tr>
<td>Description:</td>
<td>Sets a value for the fixed speed / velocity setpoint 8.</td>
</tr>
<tr>
<td>Dependency:</td>
<td>Refer to: p1020, p1021, p1022, p1023, r1024, r1197</td>
</tr>
<tr>
<td>Notice:</td>
<td>A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.</td>
</tr>
</tbody>
</table>
**Parameter**

**List of parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Notice</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>p1009[0...n]</strong></td>
<td>CO: Fixed speed setpoint 9 / n_set_fixed 9</td>
<td>Sets a value for the fixed speed / velocity setpoint 9.</td>
<td>A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.</td>
</tr>
<tr>
<td>SERVO_S110-CAN (Extended set), SERVO_S110-DP (Extended set), SERVO_S110-PN (Extended set)</td>
<td>Can be changed: U, T</td>
<td>Data type: FloatingPoint32</td>
<td>Access level: 2</td>
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<tr>
<td></td>
<td>Calculated: -</td>
<td>Dynamic index: DDS, p0180</td>
<td>Func. diagram: 3010</td>
</tr>
<tr>
<td></td>
<td>P-Group: Setpoints</td>
<td>Units group: 3_1</td>
<td>Unit selection: p0505</td>
</tr>
<tr>
<td></td>
<td>Not for motor type: -</td>
<td>Scaling: p2000</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
<td>-210000.000 [rpm]</td>
<td>Max</td>
<td>210000.000 [rpm]</td>
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<tr>
<td></td>
<td>Factory setting</td>
<td>Notice:</td>
<td>0.000 [rpm]</td>
</tr>
<tr>
<td><strong>p1010[0...n]</strong></td>
<td>CO: Fixed speed setpoint 10 / n_set_fixed 10</td>
<td>Sets a value for the fixed speed / velocity setpoint 10.</td>
<td>A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.</td>
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<tr>
<td>SERVO_S110-CAN (Extended set), SERVO_S110-DP (Extended set), SERVO_S110-PN (Extended set)</td>
<td>Can be changed: U, T</td>
<td>Data type: FloatingPoint32</td>
<td>Access level: 2</td>
</tr>
<tr>
<td></td>
<td>Calculated: -</td>
<td>Dynamic index: DDS, p0180</td>
<td>Func. diagram: 3010</td>
</tr>
<tr>
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<td>P-Group: Setpoints</td>
<td>Units group: 3_1</td>
<td>Unit selection: p0505</td>
</tr>
<tr>
<td></td>
<td>Not for motor type: -</td>
<td>Scaling: p2000</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
<td>-210000.000 [rpm]</td>
<td>Max</td>
<td>210000.000 [rpm]</td>
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<tr>
<td></td>
<td>Factory setting</td>
<td>Notice:</td>
<td>0.000 [rpm]</td>
</tr>
<tr>
<td><strong>p1011[0...n]</strong></td>
<td>CO: Fixed speed setpoint 11 / n_set_fixed 11</td>
<td>Sets a value for the fixed speed / velocity setpoint 11.</td>
<td>A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.</td>
</tr>
<tr>
<td>SERVO_S110-CAN (Extended set), SERVO_S110-DP (Extended set), SERVO_S110-PN (Extended set)</td>
<td>Can be changed: U, T</td>
<td>Data type: FloatingPoint32</td>
<td>Access level: 2</td>
</tr>
<tr>
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<td>Calculated: -</td>
<td>Dynamic index: DDS, p0180</td>
<td>Func. diagram: 3010</td>
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<td>P-Group: Setpoints</td>
<td>Units group: 3_1</td>
<td>Unit selection: p0505</td>
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<tr>
<td></td>
<td>Not for motor type: -</td>
<td>Scaling: p2000</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
<td>-210000.000 [rpm]</td>
<td>Max</td>
<td>210000.000 [rpm]</td>
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<tr>
<td></td>
<td>Factory setting</td>
<td>Notice:</td>
<td>0.000 [rpm]</td>
</tr>
<tr>
<td><strong>p1012[0...n]</strong></td>
<td>CO: Fixed speed setpoint 12 / n_set_fixed 12</td>
<td>Sets a value for the fixed speed / velocity setpoint 12.</td>
<td>A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.</td>
</tr>
<tr>
<td>SERVO_S110-CAN (Extended set), SERVO_S110-DP (Extended set), SERVO_S110-PN (Extended set)</td>
<td>Can be changed: U, T</td>
<td>Data type: FloatingPoint32</td>
<td>Access level: 2</td>
</tr>
<tr>
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<td>Calculated: -</td>
<td>Dynamic index: DDS, p0180</td>
<td>Func. diagram: 3010</td>
</tr>
<tr>
<td></td>
<td>P-Group: Setpoints</td>
<td>Units group: 3_1</td>
<td>Unit selection: p0505</td>
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<td></td>
<td>Not for motor type: -</td>
<td>Scaling: p2000</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
<td>-210000.000 [rpm]</td>
<td>Max</td>
<td>210000.000 [rpm]</td>
</tr>
<tr>
<td></td>
<td>Factory setting</td>
<td>Notice:</td>
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</table>
### p1013[0...n]
**CO: Fixed speed setpoint 13 / n_set_fixed 13**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Notice</th>
</tr>
</thead>
<tbody>
<tr>
<td>p1013[0...n]</td>
<td>Sets a value for the fixed speed / velocity setpoint 13.</td>
<td>Refer to: p1020, p1021, p1022, p1023, r1024, r1197</td>
<td>A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Type</th>
<th>Range</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min</td>
<td>-210000.000 [rpm]</td>
<td>FloatingPoint32</td>
<td>-210000.000 [rpm]</td>
<td>0.000 [rpm]</td>
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<tr>
<td>Max</td>
<td>210000.000 [rpm]</td>
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<td>210000.000 [rpm]</td>
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</table>

### p1014[0...n]
**CO: Fixed speed setpoint 14 / n_set_fixed 14**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Notice</th>
</tr>
</thead>
<tbody>
<tr>
<td>p1014[0...n]</td>
<td>Sets a value for the fixed speed / velocity setpoint 14.</td>
<td>Refer to: p1020, p1021, p1022, p1023, r1024, r1197</td>
<td>A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Type</th>
<th>Range</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min</td>
<td>-210000.000 [rpm]</td>
<td>FloatingPoint32</td>
<td>-210000.000 [rpm]</td>
<td>0.000 [rpm]</td>
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<tr>
<td>Max</td>
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<td>210000.000 [rpm]</td>
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### p1015[0...n]
**CO: Fixed speed setpoint 15 / n_set_fixed 15**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Notice</th>
</tr>
</thead>
<tbody>
<tr>
<td>p1015[0...n]</td>
<td>Sets a value for the fixed speed / velocity setpoint 15.</td>
<td>Refer to: p1020, p1021, p1022, p1023, r1024, r1197</td>
<td>A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Type</th>
<th>Range</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min</td>
<td>-210000.000 [rpm]</td>
<td>FloatingPoint32</td>
<td>-210000.000 [rpm]</td>
<td>0.000 [rpm]</td>
</tr>
<tr>
<td>Max</td>
<td>210000.000 [rpm]</td>
<td></td>
<td>210000.000 [rpm]</td>
<td></td>
</tr>
</tbody>
</table>

### p1020[0...n]
**BI: Fixed speed setpoint selection Bit 0 / n_set_fixed Bit 0**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Notice</th>
</tr>
</thead>
<tbody>
<tr>
<td>p1020[0...n]</td>
<td>Sets the signal source for selecting the fixed speed setpoint.</td>
<td>Selects the required fixed speed setpoint using p1020 ... p1023. Displays the number of the actual fixed speed setpoint in r1197. Sets the values for the fixed speed setpoints 1 ... 15 using p1001 ... p1015. Refer to: p1021, p1022, p1023, r1197</td>
<td>If a fixed speed setpoint has not been selected (p1020 ... p1023 = 0, r1197 = 0), then r1024 = 0 (setpoint = 0).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Type</th>
<th>Range</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min</td>
<td>-</td>
<td>Unsigned32 / Binary</td>
<td>-</td>
<td>0</td>
</tr>
<tr>
<td>Max</td>
<td>-</td>
<td></td>
<td>-</td>
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</tr>
</tbody>
</table>
### List of parameters

#### p1021[0...n]
**Description:** Sets the signal source for selecting the fixed speed setpoint.

**Dependency:**
- Selects the required fixed speed setpoint using p1020 ... p1023.
- Displays the number of the actual fixed speed setpoint in r1197.
- Sets the values for the fixed speed setpoints 1 ... 15 using p1001 ... p1015.
- Refer to: p1020, p1021, p1022, r1197

**Note:**
- If a fixed speed setpoint has not been selected (p1020 ... p1023 = 0, r1197 = 0), then r1024 = 0 (setpoint = 0).

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p1021</td>
<td>BI: Fixed speed setpoint selection Bit 1 / n_set_fixed Bit 1</td>
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<td>accessed level: 3</td>
</tr>
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<td>SERVO_S110-CAN (Extended set), SERVO_S110-DP (Extended set), SERVO_S110-PN (Extended set)</td>
<td>Data type: Unsigned32 / Binary</td>
<td>Calculated: -</td>
<td>Func. diagram: 2505</td>
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<tr>
<td></td>
<td>P-Group: Setpoints</td>
<td>Dynamic index: CDS, p0170</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not for motor type: -</td>
<td>Units group: -</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Min: -</td>
<td>Scaling: -</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Max: -</td>
<td>Expert list: 1</td>
<td></td>
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<tr>
<td></td>
<td>Factory setting: 0</td>
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</tbody>
</table>

#### p1022[0...n]
**Description:** Sets the signal source for selecting the fixed speed setpoint.

**Dependency:**
- Selects the required fixed speed setpoint using p1020 ... p1023.
- Displays the number of the actual fixed speed setpoint in r1197.
- Sets the values for the fixed speed setpoints 1 ... 15 using p1001 ... p1015.
- Refer to: p1020, p1021, p1023, r1197

**Note:**
- If a fixed speed setpoint has not been selected (p1020 ... p1023 = 0, r1197 = 0), then r1024 = 0 (setpoint = 0).

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p1022</td>
<td>BI: Fixed speed setpoint selection Bit 2 / n_set_fixed Bit 2</td>
<td>Can be changed: T</td>
<td>accessed level: 3</td>
</tr>
<tr>
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<td>Data type: Unsigned32 / Binary</td>
<td>Calculated: -</td>
<td>Func. diagram: 2505</td>
</tr>
<tr>
<td></td>
<td>P-Group: Setpoints</td>
<td>Dynamic index: CDS, p0170</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not for motor type: -</td>
<td>Units group: -</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Min: -</td>
<td>Scaling: -</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Max: -</td>
<td>Expert list: 1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Factory setting: 0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### p1023[0...n]
**Description:** Sets the signal source for selecting the fixed speed setpoint.

**Dependency:**
- Selects the required fixed speed setpoint using p1020 ... p1023.
- Displays the number of the actual fixed speed setpoint in r1197.
- Sets the values for the fixed speed setpoints 1 ... 15 using p1001 ... p1015.
- Refer to: p1020, p1021, p1022, r1197

**Note:**
- If a fixed speed setpoint has not been selected (p1020 ... p1023 = 0, r1197 = 0), then r1024 = 0 (setpoint = 0).

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p1023</td>
<td>BI: Fixed speed setpoint selection Bit 3 / n_set_fixed Bit 3</td>
<td>Can be changed: T</td>
<td>accessed level: 3</td>
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<td>Data type: Unsigned32 / Binary</td>
<td>Calculated: -</td>
<td>Func. diagram: 2505</td>
</tr>
<tr>
<td></td>
<td>P-Group: Setpoints</td>
<td>Dynamic index: CDS, p0170</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not for motor type: -</td>
<td>Units group: -</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Min: -</td>
<td>Scaling: -</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Max: -</td>
<td>Expert list: 1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Factory setting: 0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Parameter

List of parameters

r1024 | CO: Fixed speed setpoint effective / n_set_fixed eff
---|---
SERVO_S110-CAN (Extended set),
SERVO_S110-DP (Extended set),
SERVO_S110-PN (Extended set)

Can be changed: `-`
Data type: FloatingPoint32
P-Group: Setpoints
Not for motor type: `-`

Min: `- [rpm]`
Max: `- [rpm]`
Access level: `3`

Description:
Displays the selected and effective fixed speed setpoint.
This setpoint is the output value for the fixed speed setpoints and must be appropriately interconnected (e.g. with the main setpoint).

Recommend.: Interconnect the signal with main setpoint (p1070).
Dependency:
Selects the required fixed speed setpoint using p1020 ... p1023.
Displays the number of the actual fixed speed setpoint in r1197.
Sets the values for the fixed speed setpoints 1 ... 15 using p1001 ... p1015.

Refer to: p1070, r1197

Note:
If a fixed speed setpoint has not been selected (p1020 ... p1023 = 0, r1197 = 0), then r1024 = 0 (setpoint = 0).

p1030[0...n] | Motorized potentiometer configuration / Mop configuration
---|---
SERVO_S110-CAN (Extended set),
SERVO_S110-DP (Extended set),
SERVO_S110-PN (Extended set)

Can be changed: `U, T`
Data type: Unsigned16
P-Group: Setpoints
Not for motor type: `-`

Min: `-`
Max: `-`
Access level: `3`

Description:
Sets the configuration for the motorized potentiometer.

Bit field: | Bit | Signal name | 1 signal | 0 signal | FP |
---|---|---|---|---|---|
00 | Data save active | Yes | No | `-` |
01 | Automatic mode, ramp-function generator active | Yes | No | `-` |
02 | Initial rounding-off active | Yes | No | `-` |
03 | Save in NVRAM active | Yes | No | `-` |
04 | Ramp-function generator always active | Yes | No | `-` |

Note:
Re bit 00:
0: The setpoint for the motorized potentiometer is not saved and after ON is entered using p1040.
1: The setpoint for the motorized potentiometer is saved after OFF and after ON set to the saved value. In order to save in a non-volatile fashion, bit 03 should be set to 1.

Re bit 01:
0: Without ramp-function generator in the automatic mode (ramp-up/ramp-down time = 0).
1: With ramp-function generator in the automatic mode.

For manual operation (0 signal via BI: p1041), the ramp-function generator is always active.

Re bit 02:
0: Without initial rounding-off
1: With initial rounding-off. The selected ramp-up/down time is correspondingly exceeded. The initial rounding-off is a sensitive way of specifying small changes (progressive reaction when keys are pressed).

The jerk for the initial rounding-off is independent of the ramp-up time and only depends on the selected maximum speed (p1082). It is calculated as follows:
\[ r = 0.01 \% \times \frac{p1082 \text{ [1/s]}}{0.13^2 \text{ [s^2]}} \]
The jerk acts up until the maximum acceleration is reached (a_max = p1082 [1/s] / p1047 [s]), and then the drive continues to run linearly with a constant rate of acceleration. The higher the maximum acceleration (the lower that p1047 is), the longer the ramp-up time increases with respect to the set ramp-up time.
Re bit 03:
0: Non-volatile data save de-activated.
1: The setpoint for the motorized potentiometer is saved in a non-volatile fashion (for bit 00 = 1).
Re bit 04:
When the bit is set, the ramp-function generator is computed independent of the pulse enable. The actual output value of the motorized potentiometer is always in r1050.

### p1035[0...n]
**BL: Motorized potentiometer setpoint raise / Mop raise**

<table>
<thead>
<tr>
<th>Parameter (Extended set)</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN</td>
<td>T</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>SERVO_S110-DP</td>
<td></td>
<td>Dynamic index: CDS, p0170</td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-PN</td>
<td></td>
<td>Units group: -</td>
<td></td>
</tr>
</tbody>
</table>

**Description:**
Sets the signal source to continually increase the setpoint for the motorized potentiometer.
The setpoint change (CO: r1050) depends on the set ramp-up time (p1047) and the duration of the signal that is present (Bl: p1035).

**Dependency:** Refer to: p1036

**Notice:**
The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

### p1036[0...n]
**BL: Motorized potentiometer lower setpoint / Mop lower**

<table>
<thead>
<tr>
<th>Parameter (Extended set)</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN</td>
<td>T</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>SERVO_S110-DP</td>
<td></td>
<td>Dynamic index: CDS, p0170</td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-PN</td>
<td></td>
<td>Units group: -</td>
<td></td>
</tr>
</tbody>
</table>

**Description:**
Sets the signal source to continuously lower the setpoint for the motorized potentiometer.
The setpoint change (CO: r1050) depends on the set ramp-down time (p1048) and the duration of the signal that is present (Bl: p1036).

**Dependency:** Refer to: p1035

**Notice:**
The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

### p1037[0...n]
**Motorized potentiometer maximum speed / MotP n_max**

<table>
<thead>
<tr>
<th>Parameter (Extended set)</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN</td>
<td>U, T</td>
<td>CALC_MOD_LIM_REF</td>
<td>2</td>
</tr>
<tr>
<td>SERVO_S110-DP</td>
<td></td>
<td>Dynamic index: DDS, p0180</td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-PN</td>
<td></td>
<td>Units group: 3_1</td>
<td></td>
</tr>
</tbody>
</table>

**Description:**
Sets the maximum speed/velocity for the motorized potentiometer.
This parameter is automatically pre-assigned in the commissioning phase.
The setpoint output from the motorized potentiometer is limited to this value.
**Parameter List of parameters**

**p1038[0...n]**  
**Motorized potentiometer minimum speed / MotP n_min**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN (Extended set)</td>
<td>Can be changed: U, T</td>
<td>Sets the minimum speed/velocity for the motorized potentiometer.</td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td>Calculated: CALC_MOD_LIM_REF</td>
<td></td>
</tr>
<tr>
<td>P-Group: Setpoints</td>
<td>Dynamic index: D0, p0180</td>
<td>Func. diagram: 3020</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Units group: 3_1</td>
<td>Unit selection: 005</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
</tr>
<tr>
<td>-210000.000 [rpm]</td>
<td>210000.000 [rpm]</td>
<td>0.000 [rpm]</td>
</tr>
</tbody>
</table>

**Note:**  
This parameter is automatically pre-assigned in the commissioning phase. The setpoint output from the motorized potentiometer is limited to this value.

**p1039[0...n]**  
**BI: Motorized potentiometer inversion / MotP inv**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN (Extended set)</td>
<td>Can be changed: T</td>
<td>Sets the signal source to invert the minimum speed/velocity or the maximum speed/velocity for the motorized potentiometer.</td>
</tr>
<tr>
<td>Data type: Unsigned32 / Binary</td>
<td>Calculated: -</td>
<td></td>
</tr>
<tr>
<td>P-Group: Setpoints</td>
<td>Dynamic index: CDS, p0170</td>
<td>Func. diagram: 3020</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
</tr>
<tr>
<td>-</td>
<td>-</td>
<td>0</td>
</tr>
</tbody>
</table>

**Dependency:**  
Refer to: p1037, p1038

**Note:**  
The inversion is only active during "motorized potentiometer raise" or "motorized potentiometer lower".

**p1040[0...n]**  
**Motorized potentiometer starting value / Mop start value**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN (Extended set)</td>
<td>Can be changed: U, T</td>
<td>Sets the starting value for the motorized potentiometer. This starting value becomes effective after the drive has been powered up.</td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td>Calculated: -</td>
<td></td>
</tr>
<tr>
<td>P-Group: Setpoints</td>
<td>Dynamic index: D0, p0180</td>
<td>Func. diagram: 3020</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Units group: 3_1</td>
<td>Unit selection: 005</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
</tr>
<tr>
<td>-210000.000 [rpm]</td>
<td>210000.000 [rpm]</td>
<td>0.000 [rpm]</td>
</tr>
</tbody>
</table>

**Dependency:**  
Only effective if p1030.0 = 0.  
Refer to: p1030

**p1041[0...n]**  
**BI: Motorized potentiometer manual/automatic / Mop manual/auto**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN (Extended set)</td>
<td>Can be changed: T</td>
<td>Sets the signal source to change over from manual to automatic when using a motorized potentiometer. In the manual mode, the setpoint is changed using two signals - raise and lower. In the automatic mode, the setpoint must be interconnected via a connector input.</td>
</tr>
<tr>
<td>Data type: Unsigned32 / Binary</td>
<td>Calculated: -</td>
<td></td>
</tr>
<tr>
<td>P-Group: Setpoints</td>
<td>Dynamic index: CDS, p0170</td>
<td>Func. diagram: 3020</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
</tr>
<tr>
<td>-</td>
<td>-</td>
<td>0</td>
</tr>
</tbody>
</table>

**Dependency:**  
Refer to: p1030, p1035, p1042

**Note:**  
The effectiveness of the internal ramp-function generator can be set in automatic mode.
### List of parameters

#### p1042[0...n]
**Cl: Motorized potentiometer automatic setpoint / Mop auto setpoint**

- **Description:** Sets the signal source for the setpoint of the motorized potentiometer in the automatic mode.
- **Dependency:** Refer to: p1041

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Can be changed</th>
<th>Calculated</th>
<th>Dynamic index</th>
<th>Units group</th>
<th>Scaling</th>
<th>Expert list</th>
<th>Access level</th>
<th>Func. diagram</th>
<th>Unit selection</th>
</tr>
</thead>
<tbody>
<tr>
<td>p1042[0...n]</td>
<td>SERVO_S110-CAN (Extended set), SERVO_S110-DP (Extended set), SERVO_S110-PN (Extended set)</td>
<td>-</td>
<td>-</td>
<td>CDS, p0170</td>
<td>-</td>
<td>p2000</td>
<td>1</td>
<td>3</td>
<td>3020</td>
<td>-</td>
</tr>
</tbody>
</table>

#### p1043[0...n]
**Bl: Motorized potentiometer accept setting value / MotP acc set val**

- **Description:** Sets the signal source to accept the setting value for the motorized potentiometer.
- **Dependency:** Refer to: p1044
- **Note:** The setting value (Cl: p1044) becomes effective for a 0/1 edge of the setting command (Bl: p1043).

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Can be changed</th>
<th>Calculated</th>
<th>Dynamic index</th>
<th>Units group</th>
<th>Scaling</th>
<th>Expert list</th>
<th>Access level</th>
<th>Func. diagram</th>
<th>Unit selection</th>
</tr>
</thead>
<tbody>
<tr>
<td>p1043[0...n]</td>
<td>SERVO_S110-CAN (Extended set), SERVO_S110-DP (Extended set), SERVO_S110-PN (Extended set)</td>
<td>-</td>
<td>-</td>
<td>CDS, p0170</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>3</td>
<td>3020</td>
<td>-</td>
</tr>
</tbody>
</table>

#### p1044[0...n]
**Cl: Motorized potentiometer setting value / Mop set val**

- **Description:** Sets the signal source for the setting value of the motorized potentiometer.
- **Dependency:** Refer to: p1043
- **Note:** The setting value (Cl: p1044) becomes effective for a 0/1 edge of the setting command (Bl: p1043).

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Can be changed</th>
<th>Calculated</th>
<th>Dynamic index</th>
<th>Units group</th>
<th>Scaling</th>
<th>Expert list</th>
<th>Access level</th>
<th>Func. diagram</th>
<th>Unit selection</th>
</tr>
</thead>
<tbody>
<tr>
<td>p1044[0...n]</td>
<td>SERVO_S110-CAN (Extended set), SERVO_S110-DP (Extended set), SERVO_S110-PN (Extended set)</td>
<td>-</td>
<td>-</td>
<td>CDS, p0170</td>
<td>-</td>
<td>p2000</td>
<td>1</td>
<td>3</td>
<td>3020</td>
<td>-</td>
</tr>
</tbody>
</table>

#### r1045
**Co: Mot. potentiometer speed setp. in front of ramp-fct. gen. / Mop n_set bef RFG**

- **Description:** Sets the effective setpoint in front of the internal motorized potentiometer ramp-function generator.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Can be changed</th>
<th>Calculated</th>
<th>Dynamic index</th>
<th>Units group</th>
<th>Scaling</th>
<th>Expert list</th>
<th>Access level</th>
<th>Func. diagram</th>
<th>Unit selection</th>
</tr>
</thead>
<tbody>
<tr>
<td>r1045</td>
<td>SERVO_S110-CAN (Extended set), SERVO_S110-DP (Extended set), SERVO_S110-PN (Extended set)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>3</td>
<td>3020</td>
<td>-</td>
</tr>
</tbody>
</table>
Parameter

List of parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p1047[0...n]</td>
<td>Motorized potentiometer ramp-up time / Mop ramp-up time</td>
<td>Can be changed: U, T</td>
<td>When the initial rounding-off is activated (p1030.2) the ramp-up time is correspondingly extended.</td>
</tr>
<tr>
<td>p1048[0...n]</td>
<td>Motorized potentiometer ramp-down time / Mop ramp-down time</td>
<td>Can be changed: U, T</td>
<td>The deceleration time is extended corresponding to the activated initial rounding-off (p1030.2).</td>
</tr>
<tr>
<td>r1050</td>
<td>CO: Motor. potentiometer setpoint after the ramp-function generator / Mop setp after RFG</td>
<td>Can be changed: -</td>
<td>For &quot;With ramp-function generator&quot;, after an OFF1, OFF2, OFF3 or for a 0 signal via BI: p0852 (inhibit operation, cancel pulses) the ramp-function generator output (r1050) is set to the starting value (configuration via p1030.0).</td>
</tr>
</tbody>
</table>
### List of parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Recommendation</th>
<th>Dependency</th>
<th>Notice</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>p1051[0...n]</strong></td>
<td><strong>Cl: Speed limit RFG positive direction of rotation / n_limit RFG pos</strong></td>
<td>Sets the signal source for the speed limit of the positive direction on the ramp-function generator input.</td>
<td>When the setting for this binector input is changed, the motor can only be switched on by means of an appropriate signal change of the source.</td>
<td>The drive is enabled for jogging using BI: p1055 or BI: p1056. The command &quot;ON/OFF1&quot; can be issued using BI: p0840 or using BI: p1055/p1056. Only the signal source that was used to power up can also be used to power down again.</td>
</tr>
<tr>
<td><strong>p1052[0...n]</strong></td>
<td><strong>Cl: Speed limit RFG negative direction of rotation / n_limit RFG neg</strong></td>
<td>Sets the signal source for the speed limit of the negative direction on the ramp-function generator input.</td>
<td>When the setting for this binector input is changed, the motor can only be switched on by means of an appropriate signal change of the source.</td>
<td>The drive is enabled for jogging using BI: p1055 or BI: p1056. The command &quot;ON/OFF1&quot; can be issued using BI: p0840 or using BI: p1055/p1056. Only the signal source that was used to power up can also be used to power down again.</td>
</tr>
<tr>
<td><strong>p1055[0...n]</strong></td>
<td><strong>Bl: Jog bit 0 / Jog bit 0</strong></td>
<td>Sets the signal source for jog 1.</td>
<td>When the setting for this binector input is changed, the motor can only be switched on by means of an appropriate signal change of the source.</td>
<td>The drive is enabled for jogging using BI: p1055 or BI: p1056. The command &quot;ON/OFF1&quot; can be issued using BI: p0840 or using BI: p1055/p1056. Only the signal source that was used to power up can also be used to power down again.</td>
</tr>
<tr>
<td><strong>p1056[0...n]</strong></td>
<td><strong>Bl: Jog bit 1 / Jog bit 1</strong></td>
<td>Sets the signal source for jog 2.</td>
<td>When the setting for this binector input is changed, the motor can only be switched on by means of an appropriate signal change of the source.</td>
<td>The drive is enabled for jogging using BI: p1055 or BI: p1056. The command &quot;ON/OFF1&quot; can be issued using BI: p0840 or using BI: p1055/p1056. Only the signal source that was used to power up can also be used to power down again.</td>
</tr>
</tbody>
</table>
### List of parameters

#### p1058[0...n] Jog 1 speed setpoint / Jog 1 n_set

**Description:** Sets the speed/velocity for jog 1. Jogging is level-triggered and allows the motor to be incrementally moved.

**Dependency:** Refer to: p1055, p1056

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Data type</th>
<th>Dynamic index</th>
<th>Units group</th>
<th>Unit selection</th>
<th>Expert list</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN (Extended set), SERVO_S110-DP (Extended set), SERVO_S110-PN (Extended set)</td>
<td>Can be changed: T</td>
<td>FloatingPoint32</td>
<td>DDS, p0180</td>
<td>3_1</td>
<td>p0505</td>
<td>2</td>
<td>-210000.000 [rpm]</td>
<td>210000.000 [rpm]</td>
<td>0.000 [rpm]</td>
</tr>
</tbody>
</table>

#### p1059[0...n] Jog 2 speed setpoint / Jog 2 n_set

**Description:** Sets the speed/velocity for jog 2. Jogging is level-triggered and allows the motor to be incrementally moved.

**Dependency:** Refer to: p1055, p1056

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Data type</th>
<th>Dynamic index</th>
<th>Units group</th>
<th>Unit selection</th>
<th>Expert list</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN (Extended set), SERVO_S110-DP (Extended set), SERVO_S110-PN (Extended set)</td>
<td>Can be changed: T</td>
<td>FloatingPoint32</td>
<td>DDS, p0180</td>
<td>3_1</td>
<td>p0505</td>
<td>2</td>
<td>-210000.000 [rpm]</td>
<td>210000.000 [rpm]</td>
<td>0.000 [rpm]</td>
</tr>
</tbody>
</table>

#### p1063[0...n] Speed limit setpoint channel / n_limit setp

**Description:** Sets the speed limit/velocity limit effective in the setpoint channel.

**Dependency:** Refer to: p1082, p1083, p1085, p1086, p1088

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Data type</th>
<th>Dynamic index</th>
<th>Units group</th>
<th>Unit selection</th>
<th>Expert list</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN (Extended set), SERVO_S110-DP (Extended set), SERVO_S110-PN (Extended set)</td>
<td>Can be changed: U, T</td>
<td>FloatingPoint32</td>
<td>DDS, p0180</td>
<td>3_1</td>
<td>p0505</td>
<td>1</td>
<td>0.000 [rpm]</td>
<td>210000.000 [rpm]</td>
<td>210000.000 [rpm]</td>
</tr>
</tbody>
</table>

#### p1070[0...n] CI: Main setpoint / Main setpoint

**Description:** Sets the signal source for the main setpoint.

**Examples:**
r1024: Fixed speed setpoint effective
r1050: Motor. potentiometer setpoint after the ramp-function generator

**Dependency:** Refer to: p1071, r1073, r1078

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Data type</th>
<th>Dynamic index</th>
<th>Units group</th>
<th>Unit selection</th>
<th>Expert list</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN (Extended set), SERVO_S110-DP (Extended set), SERVO_S110-PN (Extended set)</td>
<td>Can be changed: T</td>
<td>Unsigned32 / FloatingPoint32</td>
<td>CDS, p0170</td>
<td>p0170</td>
<td>p2000</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>1024[0]</td>
</tr>
</tbody>
</table>
### List of parameters

#### Parameter 1071

**CI: Main setpoint scaling / Main setp scal**

- **SERVO_S110-CAN** (Extended set), SERVO_S110-DP (Extended set), SERVO_S110-PN (Extended set)
- **Can be changed:** T
- **Data type:** Unsigned32 / FloatingPoint32
- **P-Group:** Setpoints
- **Not for motor type:** -
- **Scaling:** PERCENT
- **Min:** -
- **Max:** -
- **Factory setting:** 1

**Description:**
Sets the signal source for scaling the main setpoint.

#### Parameter 1073

**CO: Main setpoint effective / Main setpoint eff**

- **SERVO_S110-CAN** (Extended set), SERVO_S110-DP (Extended set), SERVO_S110-PN (Extended set)
- **Can be changed:** -
- **Data type:** FloatingPoint32
- **P-Group:** Setpoints
- **Not for motor type:** -
- **Units group:** 3_1
- **Scaling:** p2000
- **Min:** - [rpm]
- **Max:** - [rpm]
- **Factory setting:** - [rpm]

**Description:**
Displays the effective main setpoint. The value shown is the main setpoint after scaling.

#### Parameter 1075

**CI: Suppl setpoint / Suppl setpoint**

- **SERVO_S110-CAN** (Extended set), SERVO_S110-DP (Extended set), SERVO_S110-PN (Extended set)
- **Can be changed:** T
- **Data type:** Unsigned32 / FloatingPoint32
- **P-Group:** Setpoints
- **Not for motor type:** -
- **Units group:** -
- **Scaling:** p2000
- **Min:** -
- **Max:** -
- **Factory setting:** 0

**Dependency:**
Refer to: p1076, r1077, r1078

**Description:**
Sets the signal source for the supplementary setpoint.

#### Parameter 1076

**CI: Supplementary setpoint scaling / Suppl setp scal**

- **SERVO_S110-CAN** (Extended set), SERVO_S110-DP (Extended set), SERVO_S110-PN (Extended set)
- **Can be changed:** T
- **Data type:** Unsigned32 / FloatingPoint32
- **P-Group:** Setpoints
- **Not for motor type:** -
- **Units group:** -
- **Scaling:** PERCENT
- **Min:** -
- **Max:** -
- **Factory setting:** 1

**Description:**
Sets the signal source for scaling the supplementary setpoint.

#### Parameter 1077

**CO: Supplementary setpoint effective / Suppl setpoint eff**

- **SERVO_S110-CAN** (Extended set), SERVO_S110-DP (Extended set), SERVO_S110-PN (Extended set)
- **Can be changed:** -
- **Data type:** FloatingPoint32
- **P-Group:** Setpoints
- **Not for motor type:** -
- **Units group:** 3_1
- **Scaling:** p2000
- **Min:** - [rpm]
- **Max:** - [rpm]
- **Factory setting:** - [rpm]

**Description:**
Displays the effective supplementary setpoint. The value shown is the additional setpoint after scaling.
### r1078
**Description:**
Displays the total effective setpoint. The value indicates the sum of the effective main setpoint and supplementary setpoint.

**Min:** 
- [rpm]

**Max:** 
- [rpm]

**Factory setting:** 
- [rpm]

### p1080[0...n]
**Description:**
Sets the lowest possible motor speed. This value is not undershot in operation.

**Min:**
0.000 [rpm]

**Max:**
19500.000 [rpm]

**Factory setting:**
0.000 [rpm]

### p1082[0...n]
**Description:**
Sets the highest possible speed.

**Dependency:**
Refer to: p0322, p0324, p0532

**Notice:**
After the value has been modified, no further parameter modifications can be made and the status is shown in r3996 = 0. Modifications can be made again when r3996 = 0.

**Note:**
The parameter applies for both motor directions. In exceptional cases, the motor can operate below this value (e.g. when reversing).

**Min:**
0.000 [rpm]

**Max:**
210000.000 [rpm]

**Factory setting:**
1500.000 [rpm]
For synchronous motors, the following additionally applies:
In the automatic calculation (p0340 = 1), p1082 is limited to speeds for which the rated current of the power unit (S1 continuous operation r0207[3]) is not sufficient as field current: p1082 < p0348 / (1 - r0207 / r0331), valid for r0207[3]<r0331.
On the other hand, an additional limit is effective, which prevents the EMF from exceeding the maximum DC link voltage (see p0643 and p1231).
The effective assignment of the motor data set parameter (e.g. p0311) to the drive data set parameter p1082 when pre-assigning should be taken from p0186.
p1082 is also available in the quick commissioning (p0010 = 1); this means that when exiting via p3900 > 0, the value is not changed.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Notice</th>
<th>CO: Speed limit in positive direction of rotation / n_limit pos</th>
<th>CO: Speed limit positive effective / n_limit pos eff</th>
<th>Cl: Speed limit in positive direction of rotation / n_limit pos</th>
<th>CO: Speed limit in negative direction of rotation / n_limit neg</th>
</tr>
</thead>
<tbody>
<tr>
<td>p1083[0...n]</td>
<td>Sets the maximum speed for the positive direction.</td>
<td>A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.</td>
<td>CO: Speed limit in positive direction of rotation / n_limit pos</td>
<td>CO: Speed limit positive effective / n_limit pos eff</td>
<td>CO: Speed limit in negative direction of rotation / n_limit neg</td>
<td></td>
</tr>
<tr>
<td>r1084</td>
<td>Displays the effective positive speed limit.</td>
<td>Refer to: p1082, p1083, p1085</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>p1085[0...n]</td>
<td>Sets the signal source for the speed limit of the positive direction.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>p1086[0...n]</td>
<td>Sets the speed limit for the negative direction.</td>
<td>A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parameter</td>
<td>Description</td>
<td>Dependency</td>
<td>Notice</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------</td>
<td>-------------</td>
<td>------------</td>
<td>--------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>r1087</td>
<td>Displays the effective negative speed limit.</td>
<td>Refer to: p1082, p1086, p1088</td>
<td>The skip (suppression) speeds can be used to prevent the effects of mechanical resonance.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>p10880...n</td>
<td>Sets the signal source for the speed/velocity limit of the negative direction.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>p10910...n</td>
<td>Sets skip speed 1.</td>
<td>Refer to: p1092, p1093, p1094, p1101</td>
<td>Skip bandwidths can also become ineffective as a result of the downstream limits in the setpoint channel.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>p10920...n</td>
<td>Sets skip speed 2.</td>
<td>Refer to: p1091, p1093, p1094, p1101</td>
<td>Skip bandwidths can also become ineffective as a result of the downstream limits in the setpoint channel.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### List of parameters

#### p1093[0...n] | Skip speed 3 / n_skip 3
--- | ---
SERVO_S110-CAN (Extended set), SERVO_S110-DP (Extended set), SERVO_S110-PN (Extended set) | Can be changed: U, T
Data type: FloatingPoint32
P-Group: Setpoints
Not for motor type: -

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.000 [rpm]</td>
<td>210000.000 [rpm]</td>
<td>0.000 [rpm]</td>
</tr>
</tbody>
</table>

- **Description:** Sets skip speed 3.
- **Dependency:** Refer to: p1091, p1092, p1094, p1101
- **Notice:** Skip bandwidths can also become ineffective as a result of the downstream limits in the setpoint channel.

#### p1094[0...n] | Skip speed 4 / n_skip 4
--- | ---
SERVO_S110-CAN (Extended set), SERVO_S110-DP (Extended set), SERVO_S110-PN (Extended set) | Can be changed: U, T
Data type: FloatingPoint32
P-Group: Setpoints
Not for motor type: -

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.000 [rpm]</td>
<td>210000.000 [rpm]</td>
<td>0.000 [rpm]</td>
</tr>
</tbody>
</table>

- **Description:** Sets skip speed 4.
- **Dependency:** Refer to: p1091, p1092, p1093, p1101
- **Notice:** Skip bandwidths can also become ineffective as a result of the downstream limits in the setpoint channel.

#### p1101[0...n] | Skip speed bandwidth / n_skip bandwidth
--- | ---
SERVO_S110-CAN (Extended set), SERVO_S110-DP (Extended set), SERVO_S110-PN (Extended set) | Can be changed: U, T
Data type: FloatingPoint32
P-Group: Setpoints
Not for motor type: -

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.000 [rpm]</td>
<td>210000.000 [rpm]</td>
<td>0.000 [rpm]</td>
</tr>
</tbody>
</table>

- **Description:** Sets the bandwidth for the skip speeds/velocities 1 to 4.
- **Dependency:** Refer to: p1091, p1092, p1093, p1094
- **Note:** The setpoint (reference) speeds are skipped (suppressed) in the range of the skip speed +/-p1101. Steady-state operation is not possible in the skipped (suppressed) speed range. The skip (suppression) range is skipped. Example:
  - p1091 = 600 and p1101 = 20
  - -> setpoint speeds between 580 and 620 [rpm] are skipped.
  - For the skip bandwidths, the following hysteresis behavior applies:
    - For a setpoint speed coming from below, the following applies:
    - For a setpoint speed coming from above, the following applies:
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>p1110[0...n]</strong></td>
<td><strong>BI: Inhibit negative direction / Inhib neg dir</strong></td>
<td><strong>Dependency:</strong> Refer to: p1111</td>
</tr>
<tr>
<td>SERVO_S110-CAN (Extended set), SERVO_S110-DP (Extended set), SERVO_S110-PN (Extended set)</td>
<td>Can be changed: T</td>
<td></td>
</tr>
<tr>
<td>Data type: Unsigned32 / Binary</td>
<td>Calculated: -</td>
<td>Access level: 3</td>
</tr>
<tr>
<td>P-Group: Setpoints</td>
<td>Dynamic index: CDS, p0170</td>
<td>Func. diagram: 2505, 3040</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
</tr>
<tr>
<td>-</td>
<td>-</td>
<td>0</td>
</tr>
<tr>
<td><strong>p1111[0...n]</strong></td>
<td><strong>BI: Inhibit positive direction / Inhib pos dir</strong></td>
<td><strong>Dependency:</strong> Refer to: p1111</td>
</tr>
<tr>
<td>SERVO_S110-CAN (Extended set), SERVO_S110-DP (Extended set), SERVO_S110-PN (Extended set)</td>
<td>Can be changed: T</td>
<td></td>
</tr>
<tr>
<td>Data type: Unsigned32 / Binary</td>
<td>Calculated: -</td>
<td>Access level: 3</td>
</tr>
<tr>
<td>P-Group: Setpoints</td>
<td>Dynamic index: CDS, p0170</td>
<td>Func. diagram: 2505, 3040</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
</tr>
<tr>
<td>-</td>
<td>-</td>
<td>0</td>
</tr>
<tr>
<td><strong>r1112</strong></td>
<td><strong>CO: Speed setpoint after minimum limiting / n_set n. min_lim</strong></td>
<td><strong>Dependency:</strong> Refer to: p1091, p1092, p1093, p1094, p1101</td>
</tr>
<tr>
<td>SERVO_S110-CAN (Extended set), SERVO_S110-DP (Extended set), SERVO_S110-PN (Extended set)</td>
<td>Can be changed: -</td>
<td></td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td>Calculated: -</td>
<td>Access level: 3</td>
</tr>
<tr>
<td>P-Group: Setpoints</td>
<td>Dynamic index: -</td>
<td>Func. diagram: 3050</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Units group: 3_1</td>
<td>Unit selection: p0505</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
</tr>
<tr>
<td>- [rpm]</td>
<td>- [rpm]</td>
<td>- [rpm]</td>
</tr>
<tr>
<td><strong>p1113[0...n]</strong></td>
<td><strong>BI: Setpoint inversion / Setp inv</strong></td>
<td><strong>Dependency:</strong> Refer to: r1198</td>
</tr>
<tr>
<td>SERVO_S110-CAN (Extended set), SERVO_S110-DP (Extended set), SERVO_S110-PN (Extended set)</td>
<td>Can be changed: T</td>
<td></td>
</tr>
<tr>
<td>Data type: Unsigned32 / Binary</td>
<td>Calculated: -</td>
<td>Access level: 3</td>
</tr>
<tr>
<td>P-Group: Setpoints</td>
<td>Dynamic index: CDS, p0170</td>
<td>Func. diagram: 2441, 2442, 2505, 3040</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
</tr>
<tr>
<td>-</td>
<td>-</td>
<td>0</td>
</tr>
<tr>
<td>Notice:</td>
<td>The parameter may be protected as a result of p0922 or p2079 and cannot be changed.</td>
<td></td>
</tr>
<tr>
<td>Parameter</td>
<td>Description</td>
<td>Value</td>
</tr>
<tr>
<td>-----------</td>
<td>-------------</td>
<td>-------</td>
</tr>
<tr>
<td>r1114</td>
<td>CO: Setpoint after the direction limiting / Setp after limit</td>
<td></td>
</tr>
<tr>
<td>p1115</td>
<td>Ramp-function generator selection / RFG selection</td>
<td></td>
</tr>
<tr>
<td>r1119</td>
<td>CO: Ramp-function generator setpoint at the input / RFG setp at inp</td>
<td></td>
</tr>
<tr>
<td>p1120[0...n]</td>
<td>Ramp-function generator ramp-up time / RFG ramp-up time</td>
<td></td>
</tr>
</tbody>
</table>

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SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3
### List of parameters

#### p1121[0...n] Ramp-function generator ramp-down time / RFG ramp-down time

- **SERVO_S110-CAN**
- **SERVO_S110-DP**
- **SERVO_S110-PN**

- **Can be changed:** C2(1), U, T
- **Data type:** FloatingPoint32
- **P-Group:** Setpoints
- **Not for motor type:** -
- **Min:** 0.000 [s]
- **Max:** 10.000 [s]

**Description:**
The ramp-function generator ramps-down the speed setpoint from the maximum speed (p1082) down to standstill (setpoint = 0) in this time. Further, the ramp-down time is always effective for OFF1.

**Dependency:**
Refer to: p1082

**Note:**
The following applies for SERVO:
The ramp-function generator is only available when the function module "extended setpoint channel" is active (r0108.8 = 1).

**Access level:** 1
**Func. diagram:** 3060, 3070
**Dynamic index:** DDS, p0180
**Units group:** -
**Unit selection:** -
**Expert list:** 1

#### p1122[0...n] BI: Bypass ramp-function generator / Bypass RFG

- **SERVO_S110-CAN** (Extended set)
- **SERVO_S110-DP** (Extended set)
- **SERVO_S110-PN** (Extended set)

- **Can be changed:** U, T
- **Data type:** Unsigned32 / Binary
- **P-Group:** Setpoints
- **Not for motor type:** -
- **Min:** -
- **Max:** 0

**Description:**
Sets the signal source for bypassing the ramp generator (ramp-up and ramp-down times = 0).

**Notice:**
The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

**Note:**
For VECTOR in encoderless operation, it is not permissible that the ramp-function generator is bypassed.

**Access level:** 3
**Func. diagram:** 2505
**Dynamic index:** CDS, p0170
**Units group:** -
**Unit selection:** -

#### p1130[0...n] Ramp-function generator initial rounding-off time / RFG t_start_round

- **SERVO_S110-CAN** (Extended set)
- **SERVO_S110-DP** (Extended set)
- **SERVO_S110-PN** (Extended set)

- **Can be changed:** U, T
- **Data type:** FloatingPoint32
- **P-Group:** Setpoints
- **Not for motor type:** -
- **Min:** 0.000 [s]
- **Max:** 30.000 [s]

**Description:**
Sets the initial rounding-off time for the extended ramp generator. The value applies to ramp-up and ramp-down.

**Note:**
Rounding-off times avoid an abrupt response and prevent damage to the mechanical system.

**Access level:** 2
**Func. diagram:** 3070
**Dynamic index:** DDS, p0180
**Units group:** -
**Unit selection:** -
**Expert list:** 1

#### p1131[0...n] Ramp-function generator final rounding-off time / RFG t_end_delay

- **SERVO_S110-CAN** (Extended set)
- **SERVO_S110-DP** (Extended set)
- **SERVO_S110-PN** (Extended set)

- **Can be changed:** U, T
- **Data type:** FloatingPoint32
- **P-Group:** Setpoints
- **Not for motor type:** -
- **Min:** 0.000 [s]
- **Max:** 30.000 [s]

**Description:**
Sets the final rounding-off time for the extended ramp generator. The value applies to ramp-up and ramp-down.

**Note:**
Rounding-off times avoid an abrupt response and prevent damage to the mechanical system.
### List of parameters

#### p1134[0...n] Ramp-function generator rounding-off type / RFG round-off type
**SERVO_S110-CAN** (Extended set),
**SERVO_S110-DP** (Extended set),
**SERVO_S110-PN** (Extended set)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p1134[0...n]</td>
<td>Sets the smoothed response to the OFF1 command or the reduced setpoint for the extended ramp-function generator.</td>
<td>0: Cont. smoothing, 1: Discont smoothing</td>
<td>0: 0, 1: 1</td>
</tr>
</tbody>
</table>

**Dependency:** No effect up to initial rounding-off time (p1130) > 0 s.

**Note:**
- p1134 = 0 (continuous smoothing)
- If the setpoint is reduced while ramping-up, initially a final rounding-off is carried out and then the ramp-up completed. During the final rounding-off, the output of the ramp-function generator continues to go in the direction of the previous setpoint (overshoot). After the final rounding-off has been completed, the output goes toward the new setpoint.
- p1134 = 1 (discontinuous smoothing)
- If the setpoint is reduced while ramping-up, then the output goes immediately in the direction of the new setpoint. For the setpoint change there is no rounding-off.

#### p1135[0...n] OFF3 ramp-down time / OFF3 t_RD
**SERVO_S110-CAN,**
**SERVO_S110-DP,**
**SERVO_S110-PN**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p1135[0...n]</td>
<td>Sets the ramp-down time from the maximum speed down to zero speed for the OFF3 command.</td>
<td>0.000 [s] to 600.000 [s], 0.000 [s]</td>
<td>0.000 [s]</td>
</tr>
</tbody>
</table>

**Note:**
- This time can be exceeded if the DC link voltage reaches its maximum value.

#### p1136[0...n] OFF3 initial rounding-off time / RFGOFF3 t_strt_rnd
**SERVO_S110-CAN,**
**SERVO_S110-DP,**
**SERVO_S110-PN**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p1136[0...n]</td>
<td>Sets the initial rounding-off time for OFF3 for the extended ramp generator.</td>
<td>0.000 [s] to 30.000 [s], 0.000 [s]</td>
<td>0.000 [s]</td>
</tr>
</tbody>
</table>

#### p1137[0...n] OFF3 final rounding-off time / RFG OFF3 t_end_del
**SERVO_S110-CAN,**
**SERVO_S110-DP,**
**SERVO_S110-PN**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p1137[0...n]</td>
<td>Sets the final rounding-off time for OFF3 for the extended ramp generator.</td>
<td>0.000 [s] to 30.000 [s], 0.000 [s]</td>
<td>0.000 [s]</td>
</tr>
</tbody>
</table>
### p1140[0...n]

**BI: Enable ramp-function generator/inhibit ramp-function generator / RFG enable**

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

**Can be changed:** T  
**Calculated:** -  
**Access level:** 3

**Data type:** Unsigned32 / Binary  
**Dynamic index:** CDS, p0170  
**Func. diagram:** 2501

**P-Group:** Setpoints  
**Units group:** -  
**Unit selection:** -

**Not for motor type:** -  
**Scaling:** -  
**Expert list:** 1  
**Factory setting:** 1

**Description:**
Sets the signal source for the command "enable ramp-function generator/inhibit ramp-function generator".

For the PROFIdrive profile, this command corresponds to control word 1 bit 4 (STW1.4).

**BI:**
- **p1140 = 0** signal: Inhibits the ramp-function generator (the ramp-function generator output is set to zero).
- **p1140 = 1** signal: Enables the ramp-function generator.

**Dependency:**
Refer to: p1141, p1142

**Caution:**
When "master control from PC" is activated, this binector input is ineffective.

**Notice:**
The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

### p1141[0...n]

**BI: Continue ramp-function generator/freeze ramp-function generator / Continue RFG**

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

**Can be changed:** T  
**Calculated:** -  
**Access level:** 3

**Data type:** Unsigned32 / Binary  
**Dynamic index:** CDS, p0170  
**Func. diagram:** 2501

**P-Group:** Setpoints  
**Units group:** -  
**Unit selection:** -

**Not for motor type:** -  
**Scaling:** -  
**Expert list:** 1  
**Factory setting:** 1

**Description:**
Sets the signal source for the command "continue ramp-function generator/freeze ramp-function generator".

For the PROFIdrive profile, this command corresponds to control word 1 bit 5 (STW1.5).

**BI:**
- **p1141 = 0** signal: Freezes the ramp-function generator.
- **p1141 = 1** signal: Continues the ramp-function generator.

**Dependency:**
Refer to: p1140, p1142

**Caution:**
When "master control from PC" is activated, this binector input is ineffective.

**Notice:**
The ramp-function generator is, independent of the state of the signal source, active in the following cases:
- OFF1/OFF3.
- ramp-function generator output within the suppression bandwidth.
- ramp-function generator output below the minimum speed.

### p1142[0...n]

**BI: Enable setpoint/inhibit setpoint / Setpoint enable**

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

**Can be changed:** T  
**Calculated:** -  
**Access level:** 3

**Data type:** Unsigned32 / Binary  
**Dynamic index:** CDS, p0170  
**Func. diagram:** 2501

**P-Group:** Setpoints  
**Units group:** -  
**Unit selection:** -

**Not for motor type:** -  
**Scaling:** -  
**Expert list:** 1  
**Factory setting:** 1

**Description:**
Sets the signal source for the command "enable setpoint/inhibit setpoint".

For the PROFIdrive profile, this command corresponds to control word 1 bit 6 (STW1.6).
<table>
<thead>
<tr>
<th>Parameter</th>
<th>BI: Ramp-function generator, accept setting value / RFG accept set v</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Dependancy:</strong> The signal source for accepting the setting value of the ramp-function generator is set using parameters. Refer to: p1144</td>
</tr>
<tr>
<td></td>
<td><strong>Note:</strong> 0/1 signal: The ramp-function generator output is immediately (without delay) set to the setting value of the ramp-function generator. 1 signal: The setting value of the ramp-function generator is effective. 1/0 signal: The input value of the ramp-function generator is effective. The ramp-function generator output is adapted to the input value using the ramp-up time or the ramp-down time. 0 signal: The input value of the ramp-function generator is effective.</td>
</tr>
</tbody>
</table>
| **p1143[0...n]** | **Data type:** Unsigned32 / Binary  
**P-Group:** Setpoints  
**Not for motor type:** -  
**Dependency:** Sets the signal source for accepting the setting value of the ramp-function generator. |
|          | **Can be changed:** U, T  
**Calculated:** -  
**Dynamic index:** CDS, p0170  
**Units group:** -  
**Scaling:** -  
**Expert list:** 1 |
|          | **MIN** | **MAX** | **Factory setting** |
|          | - | - | 0 |

<table>
<thead>
<tr>
<th>Parameter</th>
<th>CI: Ramp-function generator setting value / RFG setting value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Dependancy:</strong> The signal source for accepting the setting value of the ramp-function generator setting value is set using parameters. Refer to: p1143</td>
</tr>
<tr>
<td></td>
<td><strong>Note:</strong> Sets the signal source for the ramp-function generator setting value.</td>
</tr>
</tbody>
</table>
| **p1144[0...n]** | **Data type:** Unsigned32 / FloatingPoint32  
**P-Group:** Setpoints  
**Not for motor type:** -  
**Dependency:** Sets the signal source for accepting the setting value of the ramp-function generator. Refer to: p1143 |
|          | **Can be changed:** U, T  
**Calculated:** -  
**Dynamic index:** CDS, p0170  
**Units group:** -  
**Scaling:** p2000  
**Expert list:** 1 |
|          | **MIN** | **MAX** | **Factory setting** |
|          | - | - | 0 |

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Ramp-function generator tracking intensity. / RFG track intensity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Dependancy:</strong> Sets the ramp-function generator tracking.</td>
</tr>
</tbody>
</table>
| **p1145[0...n]** | **Data type:** FloatingPoint32  
**P-Group:** Setpoints  
**Not for motor type:** -  
**Dependency:** Sets the ramp-function generator tracking. |
|          | **Can be changed:** U, T  
**Calculated:** -  
**Dynamic index:** DDS, p0180  
**Units group:** -  
**Scaling:** -  
**Expert list:** 1 |
|          | **MIN** | **MAX** | **Factory setting** |
|          | 0.0 | 50.0 | 1.3 |
The output value of the ramp-function generator is tracked (corrected) corresponding to the maximum possible drive acceleration. The reference value is the deviation at the speed/velocity controller input that is necessary to ensure that the motor accelerates at the torque/force limit.

**Recommend:**

- **p1145 = 0.0:**
  This value de-activates the ramp-function generator tracking.
- **p1145 = 0.0 ... 1.0:**
  Generally, these values are not practical. They cause the motor to accelerate below its torque limit. The lower the selected value, the greater the margin between the controller and torque limit when accelerating.
- **p1145 > 1.0:**
  The greater the value, the higher the permissible deviation between the speed setpoint and speed actual value.

**Notice:**

If ramp-function generator tracking is activated and the ramp time is set too short, this can cause unsteady acceleration.

**Remedy:**
- switch off ramp-function generator tracking (p1145 = 0).
- increase the ramp-up/ramp-down time (p1120, p1121).

**Note:**

In the U/f mode, ramp-function generator tracking is not active.

For SERVO with U/f operation, the following applies:

The complete ramp-function generator is not active, i.e. ramp-up and ramp-down time = 0.

---

**p1148[0...n]**  
**Ramp-function gen., tolerance for ramp-up and ramp-down active / RFG tol HL/RL act**

**SERVO_S110-CAN** (Extended set),  
**SERVO_S110-DP** (Extended set),  
**SERVO_S110-PN** (Extended set)

**Can be changed:** U, T  
**Data type:** FloatingPoint32  
**P-Group:** Setpoints  
**Not for motor type:** -

**Min**  
0.000 [rpm]  
**Max**  
1000.000 [rpm]  
**Factory setting**  
19.800 [rpm]

**Description:**

Sets the tolerance value for the status of the ramp-function generator (ramp-up active, ramp-down active).

If the input of the ramp-function generator does not change in comparison to the output by more than the entered tolerance time, then the status bits "ramp-up active" and "ramp-down active" are not influenced.

**Dependency:**

Refer to: r1149

---

**r1149**  
**CO: Ramp-function generator, acceleration / RFG acceleration**

**SERVO_S110-CAN** (Extended set),  
**SERVO_S110-DP** (Extended set),  
**SERVO_S110-PN** (Extended set)

**Can be changed:** -  
**Data type:** FloatingPoint32  
**P-Group:** Setpoints  
**Not for motor type:** -

**Min**  
- [rev/s²]  
**Max**  
- [rev/s²]  
**Factory setting**  
- [rev/s²]

**Description:**

Displays the acceleration of the ramp-function generator.

**Dependency:**

Refer to: p1145

---

**r1150**  
**CO: Ramp-function generator speed setpoint at the output / RFG n_set at outp**

**SERVO_S110-CAN** (Extended set),  
**SERVO_S110-DP** (Extended set),  
**SERVO_S110-PN** (Extended set)

**Can be changed:** -  
**Data type:** FloatingPoint32  
**P-Group:** Setpoints  
**Not for motor type:** -

**Min**  
- [rpm]  
**Max**  
- [rpm]  
**Factory setting**  
- [rpm]

**Description:**

Displays the setpoint at the output of the ramp-function generator.
### List of parameters

#### p1151[0...n] Ramp-function generator configuration / RFG config

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Access level</th>
<th>Data type</th>
<th>Dynamic index</th>
<th>Func. diagram</th>
<th>Dynamic index: DDS, p0180</th>
</tr>
</thead>
<tbody>
<tr>
<td>p1152[0...n]</td>
<td>BI: Setpoint 2 enable / Setp 2 enab</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>p1155[0...n]</td>
<td>CI: Speed controller speed setpoint 1 / n_ctrl n_set 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>p1160[0...n]</td>
<td>CI: Speed controller speed setpoint 2 / n_ctrl n_set 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SERVO_S110-CAN** (Extended set), SERVO_S110-DP (Extended set), SERVO_S110-PN (Extended set)

<table>
<thead>
<tr>
<th>p1151[0...n]</th>
<th>Ramp-function generator configuration / RFG config</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sets the configuration for the extended ramp-function generator.</td>
<td>U, T</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Caution: Re bit 00 = 1:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- If the ramp-up time is longer than the ramp-down time (p1120 &gt; p1121), then there is an acceleration step at the zero crossover. This can have a negative impact on the mechanical system.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Note: Re bit 00 = 1:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- When the direction change is changed there is no rounding-off before and after the zero crossover.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bit field</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Disable rounding-off at the zero cross-over</td>
<td>Yes</td>
<td>No</td>
<td>3070</td>
</tr>
</tbody>
</table>

**p1152**

| Description | Sets the signal source for "setpoint 2 enable". |

<table>
<thead>
<tr>
<th>min</th>
<th>max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>899.15</td>
</tr>
</tbody>
</table>

**p1155[0...n]**

| Description | Sets the signal source for speed setpoint 1 of the speed controller. |

| Dependency | The effectiveness of this setpoint depends on, e.g. STW1.4 and STW1.6. Refer to: r0002, p0840, p0844, p0848, p0852, p0854, r0898, p1140, p1142, p1146, r1170, p1189, p1414, p1417, p1418 |

| Notice | The parameter may be protected as a result of p0922 or p2079 and cannot be changed. |

**p1160[0...n]**

| Description | Sets the signal source for speed setpoint 2 of the speed controller. |

| Dependency | Refer to: p1155, r1170 |

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### Note:
For OFF1/OFF3, the ramp-function generator ramp is effective.
The ramp-function generator is set (SERVO: to the actual value, VECTOR: to the setpoint (r1170)) and stops the drive corresponding to the ramp-downtime (p1121 or p1135). While stopping via the ramp-function generator, STW1.4 is effective (enable ramp-function generator).

When the function module "position control" (r0108.3 = 1) is activated, this connector input is interconnected as follows as standard:
CI: p1160 = r2562

#### r1169
**CO: Speed controller, speed setpoints 1 and 2 / n_ctrl n_set 1/2**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>r1169</td>
<td>Displays the speed setpoint after the addition of the speed setpoint 1 (p1155) and speed setpoint 2 (p1160).</td>
<td>Refer to: p1155, p1160</td>
<td>The value is only correctly displayed at r0899.2 = 1 (operation enabled).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
<th>Data type:</th>
<th>Dynamic index:</th>
<th>Unit selection:</th>
<th>Access level:</th>
<th>Device groups:</th>
</tr>
</thead>
<tbody>
<tr>
<td>r1169</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td>FloatingPoint32</td>
<td>-</td>
<td>p0505</td>
<td>3</td>
<td>Setpoints</td>
</tr>
<tr>
<td>P-Group:</td>
<td>Setpoints</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>- [rpm]</td>
<td>- [rpm]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### r1170
**CO: Speed controller, setpoint sum / n_ctrl setp sum**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>r1170</td>
<td>Displays the speed setpoint after selecting the ramp-function generator and adding the speed setpoint 1 (p1155) and speed setpoint 2 (p1160).</td>
<td>Refer to: r1150, p1155, p1160</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
<th>Data type:</th>
<th>Dynamic index:</th>
<th>Unit selection:</th>
<th>Access level:</th>
<th>Device groups:</th>
</tr>
</thead>
<tbody>
<tr>
<td>r1170</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td>FloatingPoint32</td>
<td>-</td>
<td>p0505</td>
<td>3</td>
<td>Setpoints</td>
</tr>
<tr>
<td>P-Group:</td>
<td>Setpoints</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>- [rpm]</td>
<td>- [rpm]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### p1189[0...n]
**Speed setpoint configuration / n_ctrl config**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Bit field:</th>
<th>Note</th>
</tr>
</thead>
</table>
| p1189     | Sets the configuration for the speed setpoint. | Bit | The interpolator is only effective in following cases:
- isochronous PROFIBUS operation with a sign-of-life received from the master (STW2.12 ... STW2.15).
- speed setpoint 1 and/or 2 is supplied from the technology controller (CI: p1155 = r2294, CI: p1160 = r2294). |

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
<th>Data type:</th>
<th>Dynamic index:</th>
<th>Unit selection:</th>
<th>Access level:</th>
<th>Device groups:</th>
</tr>
</thead>
<tbody>
<tr>
<td>p1189</td>
<td>U, T</td>
<td>-</td>
<td>2</td>
<td>Unsigned16</td>
<td>DDS, p0180</td>
<td></td>
<td>3080</td>
<td>Setpoints</td>
</tr>
<tr>
<td>P-Group:</td>
<td>Setpoints</td>
<td></td>
<td></td>
<td></td>
<td>Units group:</td>
<td></td>
<td>3080</td>
<td></td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td>Max</td>
<td></td>
<td>0011 bin</td>
<td></td>
</tr>
</tbody>
</table>

### Bit field:

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Interpolation ramp-fct gen/speed controller active</td>
<td>Yes</td>
<td>No</td>
<td>3080</td>
</tr>
<tr>
<td>01</td>
<td>Interpol. op-loop ctrl /speed controller active</td>
<td>Yes</td>
<td>No</td>
<td>3080</td>
</tr>
</tbody>
</table>
**p1190**

**CI: DSC position deviation XERR / DSC XERR**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Notice</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p1190</td>
<td>Sets the signal source for the position deviation XERR for DSC (position controller output of the higher-level control).</td>
<td>Clock cycle synchronous operation must be activated for DSC.</td>
<td>The parameter may be protected as a result of p0922 or p2079 and cannot be changed.</td>
<td>DSC: Dynamic Servo Control</td>
</tr>
</tbody>
</table>

**Value**

- Min: -
- Max: 0

**Parameter types**

- **Data type:** Unsigned32 / Integer32
- **P-Group:** Setpoints
- **Not for motor type:** -
- **Min:** -
- **Max:** 0
- **Access level:** 3
- **Function diagram:** 1550
- **Unit selection:** -
- **Expert list:** 1

**Value range:**

- Min: -
- Max: 0

**Factory setting:**

- Min: -
- Max: 0

---

**p1191**

**CI: DSC position controller gain KPC / DSC KPC**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Notice</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p1191</td>
<td>Sets the signal source for the position controller gain KPC for DSC.</td>
<td>Clock cycle synchronous operation must be activated for DSC.</td>
<td>The parameter may be protected as a result of p0922 or p2079 and cannot be changed.</td>
<td>DSC: Dynamic Servo Control</td>
</tr>
</tbody>
</table>

**Value**

- Min: -
- Max: 0

**Parameter types**

- **Data type:** Unsigned32 / FloatingPoint32
- **P-Group:** Setpoints
- **Not for motor type:** -
- **Min:** -
- **Max:** 0
- **Access level:** 3
- **Function diagram:** 1550
- **Unit selection:** -
- **Expert list:** 1

**Value range:**

- Min: -
- Max: 0

**Factory setting:**

- Min: -
- Max: 0

---

**p1192[0...n]**

**DSC enc selection / DSC enc selection**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Notice</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p1192</td>
<td>Sets the number of the encoder used for DSC.</td>
<td>1: Encoder 1 (motor encoder) 2: Encoder 2 3: Reserved</td>
<td>Value 1 corresponds to encoder 1 (motor encoder); the encoder data set is assigned via p0187. Value 2 corresponds to encoder 2; the encoder data set is assigned via p0188.</td>
<td>DSC: Dynamic Servo Control</td>
</tr>
</tbody>
</table>

**Parameter types**

- **Data type:** Integer16
- **P-Group:** Setpoints
- **Not for motor type:** -
- **Min:** 1
- **Max:** 3
- **Access level:** 3
- **Function diagram:** DDS, p0180
- **Unit selection:** -
- **Expert list:** 1

**Value range:**

- Min: 1
- Max: 3

**Factory setting:**

- Min: 1
- Max: 3

---

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### List of parameters

**Description:**
Sets the factor to adapt the encoder when using either encoder 2 or 3 for DSC. The factor sets the ratio of the pulse difference between the motor encoder and the selected encoder for the same distance moved through.

This factor takes into account e.g. gear ratios, differences in the number of encoder pulses.

**Dependency:**
Refer to: p1192

**Note:**
DSC: Dynamic Servo Control

**Example:**
Encoder 1: Motor encoder with 2048 pulses/revolution, ballscrew with 10 mm/revolution pitch
Encoder 2: Linear scale with 20 µm grid division as direct measuring system

\[
p_{1193} = \frac{\text{number of pulses, encoder 1 per motor revolution}}{\text{number of pulses, encoder 2 per motor revolution}}
\]

\[
p_{1193} = \frac{2048}{(10 \text{ mm} / 20 \mu \text{m})} = 4.096
\]

### p1193[0...n]

**Parameter name:** DSC encoder adaptation factor / DSC encodAdaptFact

**SERVO_S110-CAN,**
**SERVO_S110-DP,**
**SERVO_S110-PN**

**Can be changed:** U, T  
**Calculated:**  
**Access level:** 3

**Data type:** FloatingPoint32  
**Dynamic index:** DDS, p0180  
**Func. diagram:** -

**P-Group:** Setpoints  
**Units group:** -  
**Unit selection:** -

**Not for motor type:** -  
**Scaling:** -  
**Expert list:** 1

**Min**  
0.000

**Max**  
100000.000

**Factory setting**  
1.000

**Description:**
Displays the number of the selected fixed speed/velocity setpoint.

**Dependency:**
Refer to: p1020, p1021, p1022, p1023

**Note:**
If a fixed speed setpoint has not been selected (p1020 ... p1023 = 0, r1197 = 0), then r1024 = 0 (setpoint = 0).

### r1197

**Parameter name:** Fixed speed setpoint number actual / n_set_fixed  
**No act**

**SERVO_S110-CAN** (Extended set),  
**SERVO_S110-DP** (Extended set),  
**SERVO_S110-PN** (Extended set)

**Can be changed:** -  
**Calculated:** -  
**Access level:** 3

**Data type:** Unsigned32  
**Dynamic index:** -  
**Func. diagram:** 3010

**P-Group:** Setpoints  
**Units group:** -  
**Unit selection:** -

**Not for motor type:** -  
**Scaling:** -  
**Expert list:** 1

**Min**  
-

**Max**  
-

**Factory setting**  
-

**Description:**
Displays the control word for the setpoint channel.

**Bit field:**

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Fixed setp bit 0</td>
<td>Yes</td>
<td>No</td>
<td>3010</td>
</tr>
<tr>
<td>01</td>
<td>Fixed setp bit 1</td>
<td>Yes</td>
<td>No</td>
<td>3010</td>
</tr>
<tr>
<td>02</td>
<td>Fixed setp bit 2</td>
<td>Yes</td>
<td>No</td>
<td>3010</td>
</tr>
<tr>
<td>03</td>
<td>Fixed setp bit 3</td>
<td>Yes</td>
<td>No</td>
<td>3010</td>
</tr>
<tr>
<td>05</td>
<td>Inhibit negative direction</td>
<td>Yes</td>
<td>No</td>
<td>3040</td>
</tr>
<tr>
<td>06</td>
<td>Inhibit positive direction</td>
<td>Yes</td>
<td>No</td>
<td>3040</td>
</tr>
<tr>
<td>11</td>
<td>Setpoint inversion</td>
<td>Yes</td>
<td>No</td>
<td>3040</td>
</tr>
<tr>
<td>13</td>
<td>Motorized potentiometer raise</td>
<td>Yes</td>
<td>No</td>
<td>3020</td>
</tr>
<tr>
<td>14</td>
<td>Motorized potentiometer lower</td>
<td>Yes</td>
<td>No</td>
<td>3020</td>
</tr>
<tr>
<td>15</td>
<td>Bypass ramp-function generator</td>
<td>Yes</td>
<td>No</td>
<td>3060, 3070</td>
</tr>
</tbody>
</table>

### r1198.0...15

**Parameter name:** CO/BO: Control word setpoint channel / STW setpoint chan

**SERVO_S110-CAN** (Extended set),  
**SERVO_S110-DP** (Extended set),  
**SERVO_S110-PN** (Extended set)

**Can be changed:** -  
**Calculated:** -  
**Access level:** 3

**Data type:** Unsigned16  
**Dynamic index:** -  
**Func. diagram:** 1530, 2505

**P-Group:** Setpoints  
**Units group:** -  
**Unit selection:** -

**Not for motor type:** -  
**Scaling:** -  
**Expert list:** 1

**Min**  
-

**Max**  
-

**Factory setting**  
-

**Description:**
Displays the control word for the setpoint channel.
r1199.0...6  CO/BO: Ramp-function generator status word / RFG ZSW

SERVO_S110-CAN (Extended set), SERVO_S110-DP (Extended set), SERVO_S110-PN (Extended set)

Description: Displays the status word for the ramp-function generator (RFG).

Bit field: Bit Signal name 1 signal 0 signal FP
00 Ramp-up active Yes No -
01 Ramp-down active Yes No -
02 RFG active Yes No -
03 Ramp-function generator set Yes No -
04 Ramp-function generator held Yes No -
05 Ramp-function generator tracking active Yes No -
06 Maximum limit active Yes No -

Note: Re bit 02:
The bit is an OR logic operation - bit 00 and bit 01.

p1206[0...9]  Set the fault number without automatic restart / Fault_No w/o AR

SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

Description: Selects the faults for which automatic restart should not be effective.

Dependency: The setting is only effective for p1210 = 6, 16.
Refer to: p1210

p1208[0...1]  BI: AR modification infeed / AR modification

SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

Description: Sets the signal source to modify the automatic restart (AR).
Interconnections between the automatic restart and infeed:
With the following interconnection in the mode p1210 = 6, the automatic restart can respond to infeed faults:
BI: p1208[0] = r2139.3
With the following interconnection, in the mode p1210 = 4, the automatic restart can respond to line supply failure of the infeed:
BI: p1208[1] = r0863.2

Index: [0] = Infeed fault
[1] = Infeed line supply failure

Dependency: Refer to: r0863, r2139
### p1210

**Automatic restart, mode / AR mode**

<table>
<thead>
<tr>
<th>Description</th>
<th>Sets the automatic restart mode (AR).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value: 0</td>
<td>Inhibit automatic restart</td>
</tr>
<tr>
<td>1</td>
<td>Acknowledge all faults without restarting</td>
</tr>
<tr>
<td>4</td>
<td>Restart after line supply failure w/o additional start attempts</td>
</tr>
<tr>
<td>6</td>
<td>Restart after fault with additional start attempts</td>
</tr>
<tr>
<td>14</td>
<td>Restart after line supply failure following man. acknowledgment</td>
</tr>
<tr>
<td>16</td>
<td>Restart after fault following manual acknowledgment</td>
</tr>
</tbody>
</table>

**Dependency:**
- The automatic restart requires an active ON command (e.g., via a digital input). If, for p1210 > 1, there is no active ON command, then the automatic restart is interrupted.
- When using an Operator Panel in the LOCAL mode, then there is no automatic start.
- For p1210 = 14, 16, a manual acknowledgement is required for an automatic restart.

**Refer to:** p0840, p0857, F30003

**Danger:**
- If the automatic restart is activated (p1210 > 1) if there is an ON command (refer to p0840), the drive is powered up as soon as any fault messages that are present can be acknowledged. This also occurs after the line supply returns or the Control Unit boots if the DC link voltage is again present or the feedback of the line supply infeed (refer to p0864) is again available. This automatic power-up sequence can only be interrupted by withdrawing the ON command.

**Caution:**
- A change is only accepted and made in the state "initialization" (r1214.0) and "wait for alarm" (r1214.1). When faults are present, therefore, the parameter cannot be changed.
- For p1210 > 1, the motor is automatically started.

**Note:**
- Re p1210 = 1: Faults that are present are automatically acknowledged. If new faults occur after a successful fault acknowledgment, then these are also automatically acknowledged again. p1211 has no influence on the number of acknowledgment attempts.
- Re p1210 = 4: An automatic restart is only carried out if fault F30003 occurred at the Motor Module or a 1 signal is present at binector input p1208[1]. If additional faults are present, then these faults are also acknowledged and when successful, starting continues. If the 24 V Control Unit power supply fails, then this is interpreted as a line supply failure.
- Re p1210 = 6: An automatic restart is carried out if any fault has occurred or there is a 1 signal at binector input p1208[0].
- Re p1210 = 14: As for p1210 = 4. However, faults that are present must be manually acknowledged.
- Re p1210 = 16: As for p1210 = 6. However, faults that are present must be manually acknowledged.

### p1211

**Automatic restart, start attempts / AR start attempts**

<table>
<thead>
<tr>
<th>Description</th>
<th>Sets the start attempts of the automatic restart function for p1210 = 4, 6.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependency:</td>
<td>Refer to: p1210, r1214</td>
</tr>
<tr>
<td>Caution:</td>
<td>A change is only accepted and made in the state &quot;initialization&quot; (r1214.0) and &quot;wait for alarm&quot; (r1214.1).</td>
</tr>
</tbody>
</table>
Notice: After fault F07320 occurs, the power-on command must be withdrawn and all of the faults acknowledged so that the automatic restart function is re-activated.

After a complete power failure the start counter always starts with the counter value that applied before the power failure, and decrements this start attempt by 1. If a further attempt to acknowledge is started by the automatic restart function prior to power failure, e.g. when the CU remains active on power failure longer than the time \( p1212 / 2 \), the fault counter will already have been decremented once. In this case, the start counter is thus decreased by the value 2.

Note: A start attempt starts immediately when a fault occurs. The start attempt is considered to been completed if the motor was magnetized (\( r0056.4 = 1 \)) and an additional delay time of 1 s has expired.

As long as a fault is present, an acknowledge command is generated in the time intervals of \( p1212 / 2 \). When successfully acknowledged, the start counter is decremented. If, after this, a fault re-occurs before a restart has been completed, then acknowledgement starts again from the beginning.

Fault F07320 is output if, after several faults occur, the number of parameterized start attempts has been reached.

After a successful start attempt, i.e. a fault/error has no longer occurred up to the end of the magnetizing phase, the start counter is again reset to the parameter value after 1 s. If a fault re-occurs - the parameterized number of start attempts is again available.

At least one start attempt is always carried out.

After a line supply failure, acknowledgement is immediate and when the line supply returns, the system is powered up. If, between successfully acknowledging the line fault and the line supply returning, another fault occurs, then its acknowledgement also causes the start counter to be decremented.

---

### p1212

#### Automatic restart, delay time start attempts / AR t_wait start

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
</tr>
</thead>
</table>

Can be changed: U, T  Calculated: -  Access level: 3

Data type: FloatingPoint32  Dynamic index: -  Func. diagram: -

P-Group: Functions  Units group: -  Unit selection: -

Not for motor type: -  Scaling: -  Expert list: 1

Min 0.1 [s]

Max 1000.0 [s]  Factory setting 1.0 [s]

**Description:** Sets the delay time up to restart.

**Dependency:**

This parameter setting is active for \( p1210 = 4, 6 \).

For \( p1210 = 1 \), the following applies: Faults are only automatically acknowledged in half of the delay time, no restart.

Refer to: p1210, r1214

**Caution:** A change is only accepted and made in the state "initialization" (r1214.0) and "wait for alarm" (r1214.1).

**Note:** The faults are automatically acknowledged after half of the delay time has expired and the full delay time.

If the cause of a fault is not removed in the first half of the delay time, then it is no longer possible to acknowledge in the delay time.

---

### p1213[0...1]

#### Automatic restart, monitoring time / AR t_monitoring

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
</tr>
</thead>
</table>

Can be changed: U, T  Calculated: -  Access level: 3

Data type: FloatingPoint32  Dynamic index: -  Func. diagram: -

P-Group: Functions  Units group: -  Unit selection: -

Not for motor type: -  Scaling: -  Expert list: 1

Min 0.0 [s]

Max 10000.0 [s]  Factory setting 0.0 [s]

**Description:** Sets the monitoring time of the automatic restart (AR).

**Index:**

[0] = For restart
[1] = To reset the start counter

**Dependency:** Refer to: p1210, r1214

**Caution:** A change is only accepted and made in the state "initialization" (r1214.0) and "wait for alarm" (r1214.1).

**Notice:** After fault F07320 occurs, the power-on command must be withdrawn and all of the faults acknowledged so that the automatic restart function is re-activated.
Note:

Index 0:
The monitoring time starts when the faults are detected. If the automatic acknowledgements are not successful, the monitoring time runs again. If, after the monitoring time has expired, the drive has still not successfully started again (flying restart and magnetizing of the motor must have been completed: r0056.4 = 1), then fault F07320 is output. The monitoring is de-activated with p1213 = 0. If p1213 is set lower than the sum of p1212, the magnetizing time p0346 and the additional delay time due to the flying restart, then fault F07320 is generated at each restart. If, for p1210 = 1, the time in p1213 is set lower than in p1212, then fault F07320 is also generated at each restart. The monitoring time must be extended if the faults that occur cannot be immediately and successfully acknowledged (e.g. for faults that are permanently present).

In the case of p1210 = 14, 16, the faults which are present must be acknowledged manually within the time in p1213 index 0. Otherwise, fault F07320 is generated after the set time.

Index 1:
The start counter (refer to r1214) is only set back to the starting value p1211 if, after successful restart, the time in p1213 index 1 has expired. The delay time is not effective for fault acknowledgement without automatic restart (p1210 = 1). After a power failure (blackout) the delay time only starts after the line supply returns and the Control Unit boots. The start counter is set to p1211, if F07320 occurred, the power-on command is withdrawn and the fault is acknowledged.

The start counter is immediately updated if the starting value p1211 or the mode p1210 is changed.

**r1214.0...15**

**CO/BO: Automatic restart, status / AR status**

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Can be changed:</strong> -</td>
</tr>
<tr>
<td><strong>Data type:</strong> Unsigned16</td>
</tr>
<tr>
<td><strong>P-Group:</strong> Functions</td>
</tr>
<tr>
<td><strong>Not for motor type:</strong> -</td>
</tr>
<tr>
<td><strong>Min</strong></td>
</tr>
<tr>
<td>-</td>
</tr>
</tbody>
</table>

**Description:**
Displays the status of the automatic restart (AR).

**Bit field:**

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Initialization</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>01</td>
<td>Wait for alarm</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>02</td>
<td>Auto restart act</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>03</td>
<td>Setting the acknowledgement command</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>04</td>
<td>Acknowledge alarms</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>05</td>
<td>Restart</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>06</td>
<td>Delay time running after automatic power-up</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>07</td>
<td>Fault</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>10</td>
<td>Effective fault</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>12</td>
<td>Start count. bit 0</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>13</td>
<td>Start count. bit 1</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>14</td>
<td>Start count. bit 2</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>15</td>
<td>Start count. bit 3</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
</tbody>
</table>

**Note:**

Re bit 00:
State to display the single initialization after POWER ON.

Re bit 01:
State in which the automatic restart function waits for faults (initial state).

Re bit 02:
General display that a fault has been identified and that the restart or acknowledgement has been initiated.

Re bit 03:
Displays the acknowledge command within the "acknowledge alarms" state (bit 4 = 1). For bit 5 = 1 or bit 6 = 1, the acknowledge command is continually displayed.

Re bit 04:
State in which the faults that are present are acknowledged. The state is exited again after successful acknowledgement. A change is only made into the next state if it is signaled that a fault is no longer present after an acknowledgement command (bit 3 = 1).

Re bit 05:
State in which the drive is automatically powered up (only for p1210 = 4, 6).
Re bit 06:
State in which the system waits after having been powered up, to the end of the start attempt (to the end of the
magnetizing process).
For p1210 = 1, this signal is directly set after the faults have been successfully acknowledged.
Re bit 07:
State which is assumed after a fault occurs within the automatic restart function. This is only reset after acknowl-
edging the fault and withdrawing the power-on command.
Re bit 10:
When the automatic restart function is active, r1214 bit 7 is displayed, otherwise the effective fault r2139 bit 3.
Re bits 12 ... 15:
Actual state of the start counter (binary coded).

<table>
<thead>
<tr>
<th>p1215</th>
<th>Motor holding brake configuration / Brake config</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td></td>
</tr>
<tr>
<td>Can be changed: T</td>
<td></td>
</tr>
<tr>
<td>Data type: Integer16</td>
<td></td>
</tr>
<tr>
<td>P-Group: Functions</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td></td>
</tr>
<tr>
<td>Min 0</td>
<td></td>
</tr>
<tr>
<td>Max 3</td>
<td></td>
</tr>
<tr>
<td>Factory setting 0</td>
<td></td>
</tr>
<tr>
<td>Description: Sets the holding brake configuration.</td>
<td></td>
</tr>
<tr>
<td>Value:</td>
<td></td>
</tr>
<tr>
<td>0: No motor holding brake being used</td>
<td></td>
</tr>
<tr>
<td>1: Motor holding brake acc. to sequence control</td>
<td></td>
</tr>
<tr>
<td>2: Motor holding brake always open</td>
<td></td>
</tr>
<tr>
<td>3: Motor holding brake like sequence control, connection via BICO</td>
<td></td>
</tr>
<tr>
<td>Dependency: Refer to: p1216, p1217, p1226, p1227, p1228, p1278</td>
<td></td>
</tr>
<tr>
<td>Caution: For the setting p1215 = 0, if a brake is used, it remains closed. If the motor moves, this will destroy the brake.</td>
<td></td>
</tr>
<tr>
<td>Notice: If p1215 was set to 1 or if p1215 was set to 3, then when the pulses are suppressed, the brake is closed even if the motor is still rotating. Pulse suppression can either be caused by a 0 signal at p0844, p0845 or p0852 or as a result of a fault with OFF2 response. If this is not desirable (e.g. for a flying restart), then the brake can be kept open using a 1 signal at p0855.</td>
<td></td>
</tr>
<tr>
<td>Note: If the configuration is set to &quot;no holding brake present&quot; when booting, then the motor holding brake will be automatically identified. If a motor holding brake is detected, the configuration is set to &quot;motor holding brake as for sequence control&quot;.</td>
<td></td>
</tr>
<tr>
<td>If a holding brake integrated in the motor is used, then it is not permissible that p1215 is set to 3.</td>
<td></td>
</tr>
<tr>
<td>If an external motor holding brake is being used, then p1215 should be set to 3 and r0899.12 should be interconnected as control signal.</td>
<td></td>
</tr>
<tr>
<td>When the function module &quot;extended brake control&quot; is activated (r0108.14 = 1), r1229.1 should be interconnected as control signal.</td>
<td></td>
</tr>
<tr>
<td>The parameter can only be set to zero when the pulses are inhibited.</td>
<td></td>
</tr>
<tr>
<td>The parameterization &quot;no motor holding brake available&quot; and &quot;Safe Brake Control&quot; enabled (p1215 = 0, p9602 = 1, p9802 = 1) is not practical if there is no motor holding brake.</td>
<td></td>
</tr>
<tr>
<td>The parameterization &quot;motor holding brake the same as sequence control, connection via BICO&quot; and &quot;Safe Brake Control&quot; enabled (p1215 = 3, p9602 = 1, p9802 = 1) is not practical.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>p1216</th>
<th>Motor holding brake, opening time / Brake t_open</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td></td>
</tr>
<tr>
<td>Can be changed: U, T</td>
<td></td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td></td>
</tr>
<tr>
<td>P-Group: Functions</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td></td>
</tr>
<tr>
<td>Min 0 [ms] 10000 [ms]</td>
<td></td>
</tr>
<tr>
<td>Max 100 [ms]</td>
<td></td>
</tr>
<tr>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td>Description: Sets the time to open the motor holding brake.</td>
<td></td>
</tr>
<tr>
<td>After controlling the holding brake (opens), the speed/velocity setpoint remains at zero for this time. After this, the speed/velocity setpoint is enabled.</td>
<td></td>
</tr>
</tbody>
</table>
**Parameter**

**List of parameters**

**p1217**

**Motor holding brake closing time / Brake t_close**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Value Range</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed:</td>
<td>U, T</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data type:</td>
<td>FloatingPoint32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P-Group:</td>
<td>Functions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
<td>Max</td>
<td>Factory setting</td>
</tr>
<tr>
<td>Min</td>
<td>0 [ms]</td>
<td>10000 [ms]</td>
<td>100 [ms]</td>
</tr>
</tbody>
</table>

**Description:**
Sets the time to apply the motor holding brake.

After OFF1 or OFF3 and the holding brake is controlled (the brake closes), then the drive remains closed-loop controlled for this time stationary with a speed setpoint/velocity setpoint of zero. The pulses are suppressed when the time expires.

**Recommend.:**
This time should be set longer than the actual opening time of the brake. This ensures that the drive cannot accelerate when the brake is applied.

**Dependency:**
Refer to: p1215, p1217

**Notice:**
If the selected closing time is too short with respect to the actual closing time of the brake, then the load can sag. If the closing time is selected to be too long with respect to the actual closing time of the brake, the control works against the brake and therefore reduces its lifetime.

**p1218[0...1]**

**BI: Open motor holding brake / Open brake**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Value Range</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed:</td>
<td>T</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data type:</td>
<td>Signed32 / Binary</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P-Group:</td>
<td>Functions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
<td>Max</td>
<td>1</td>
</tr>
</tbody>
</table>

**Description:**
Sets the signal source for a conditional opening of the motor holding brake.

**Dependency:**
Refer to: p1215

**Note:**
[0]: Signal, open brake, AND logic operation, input 1
[1]: Signal, open brake, AND logic operation, input 2

**p1219[0...3]**

**BI: Immediately close motor holding brake / Close brake**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Value Range</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed:</td>
<td>T</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data type:</td>
<td>Signed32 / Binary</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P-Group:</td>
<td>Functions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
<td>Max</td>
<td>Factory setting</td>
</tr>
<tr>
<td>Min</td>
<td>-</td>
<td>-</td>
<td>0</td>
</tr>
</tbody>
</table>

**Description:**
Sets the signal source for an unconditional (immediate) closing of the motor holding brake.

**Dependency:**
Refer to: p1215, p1275

**Note:**
[0]: Signal, immediately close brake, inversion via p1275.0
[1]: Signal, immediately close brake, inversion via p1275.1
[2]: Signal, immediately close brake
[3]: Signal, immediately close brake - refer to the factory setting
These four signals form an OR logic operation.
### p1220

**Parameter:** Open motor holding brake, signal source, threshold / Open brake thresh

<table>
<thead>
<tr>
<th>Source/Type</th>
<th>Default</th>
<th>Description</th>
<th>Dependency</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN (Extended brk), SERVO_S110-DP (Extended brk), SERVO_S110-PN (Extended brk)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:**
Sets the signal source for the command "open brake".

**Dependency:**
Refer to: p1215, p1221, r1229, p1277

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>T</td>
<td></td>
<td></td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Data type:</th>
<th>Dynamic index:</th>
<th>Func. diagram:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unsigned32 / FloatingPoint32</td>
<td></td>
<td></td>
<td>2707</td>
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<table>
<thead>
<tr>
<th>Parameter</th>
<th>P-Group:</th>
<th>Units group:</th>
<th>Unit selection:</th>
</tr>
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<tbody>
<tr>
<td>Functions</td>
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<table>
<thead>
<tr>
<th>Parameter</th>
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<th>Expert list:</th>
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<tbody>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td></td>
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</tr>
</tbody>
</table>

### p1221

**Parameter:** Open motor holding brake, threshold / Open brake thresh

<table>
<thead>
<tr>
<th>Source/Type</th>
<th>Default</th>
<th>Description</th>
<th>Dependency</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN (Extended brk), SERVO_S110-DP (Extended brk), SERVO_S110-PN (Extended brk)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:**
Sets the threshold value for the command "open brake".

**Dependency:**
Refer to: p1220, r1229, p1277

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>T, U</td>
<td></td>
<td></td>
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<thead>
<tr>
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<th>Data type:</th>
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<th>Func. diagram:</th>
</tr>
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<tbody>
<tr>
<td>FloatingPoint32</td>
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<table>
<thead>
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<th>P-Group:</th>
<th>Units group:</th>
<th>Unit selection:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Functions</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Not for motor type:</th>
<th>Scaling:</th>
<th>Expert list:</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.00 [%]</td>
<td></td>
<td></td>
<td>200.00 [%]</td>
</tr>
</tbody>
</table>

### p1222

**Parameter:** Motor holding brake feedback signal brake closed / Brake feedb closed

<table>
<thead>
<tr>
<th>Source/Type</th>
<th>Default</th>
<th>Description</th>
<th>Dependency</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN (Extended brk), SERVO_S110-DP (Extended brk), SERVO_S110-PN (Extended brk)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:**
Sets the signal source for the feedback signal "brake closed".

**Dependency:**
Refer to: p1223, p1275

**Note:**
1 signal: Brake closed.

When braking with 1 feedback signal, the inverted feedback signal is connected to the BICO input for the second feedback signal (p1223).

For r1229.5 = 1, OFF1/OFF3 are suppressed to prevent the drive accelerating by a load that drives the motor - whereby OFF2 remains effective.

### p1223

**Parameter:** Motor holding brake feedback signal brake open / Brake feedb open

<table>
<thead>
<tr>
<th>Source/Type</th>
<th>Default</th>
<th>Description</th>
<th>Dependency</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN (Extended brk), SERVO_S110-DP (Extended brk), SERVO_S110-PN (Extended brk)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:**
Sets the signal source for the feedback signal "brake open".

**Dependency:**
Refer to: p1222, p1275

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>T</td>
<td></td>
<td></td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Data type:</th>
<th>Dynamic index:</th>
<th>Func. diagram:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unsigned32 / Binary</td>
<td></td>
<td></td>
<td>2711</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>P-Group:</th>
<th>Units group:</th>
<th>Unit selection:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Functions</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Not for motor type:</th>
<th>Scaling:</th>
<th>Expert list:</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Min</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Parameter**

**List of parameters**

**Note:**
1 signal: Brake open.
When braking with 1 feedback signal, the inverted feedback signal is connected to the BICO input for the second feedback signal (p1222).

**p1224[0...3]**

**Bi: Close motor holding brake at standstill / Brk close standst**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Default</th>
<th>Access level</th>
<th>Data type</th>
<th>Dynamic index</th>
<th>Unit selection</th>
</tr>
</thead>
<tbody>
<tr>
<td>p1224[0]</td>
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<td></td>
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</tr>
<tr>
<td>p1224[1]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>p1224[2]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>p1224[3]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:**
Sets the signal source for close brake at standstill.

**Dependency:**
Refer to: p1275

**Note:**
- [0]: Signal, close brake at standstill, inversion via p1275.2
- [1]: Signal, close brake at standstill, inversion via p1275.3
- [2]: Signal, close brake at standstill
- [3]: Signal, close brake at standstill

These four signals form an OR logic operation.

**p1225**

**Cl: Standstill detection, threshold value / Standstill thresh**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Default</th>
<th>Access level</th>
<th>Data type</th>
<th>Dynamic index</th>
<th>Unit selection</th>
</tr>
</thead>
<tbody>
<tr>
<td>p1225</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

**Description:**
Sets the signal source "threshold value" for the standstill identification.

**Dependency:**
Refer to: p1226, p1228, r1229

**p1226[0...n]**

**Threshold for zero speed detection / n_standst n_thresh**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Default</th>
<th>Access level</th>
<th>Data type</th>
<th>Dynamic index</th>
<th>Unit selection</th>
</tr>
</thead>
<tbody>
<tr>
<td>p1226</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:**
Sets the speed threshold for the standstill identification.
Acts on the actual value and setpoint monitoring.
When braking with OFF1 or OFF3, when the threshold is undershot, standstill is identified.
The following applies when the brake control is activated:
When the threshold is undershot, the brake control is started and the system waits for the brake closing time in p1217. The pulses are then suppressed.
If the brake control is not activated, the following applies:
When the threshold is undershot, the pulses are suppressed and the drive coasts down.

**Dependency:**
Refer to: p1215, p1216, p1217, p1227

**Notice:**
For reasons relating to the compatibility to earlier firmware versions, a parameter value of zero in indices 1 to 31 is overwritten with the parameter value in index 0 when the Control Unit boots.
Note: Standstill is identified in the following cases:
- the speed actual value falls below the speed threshold in p1226 and the time started after this in p1228 has expired.
- the speed setpoint falls below the speed threshold in p1226 and the time started after this in p1227 has expired.

The actual value sensing is subject to measuring noise. For this reason, standstill cannot be detected if the speed threshold is too low.

<table>
<thead>
<tr>
<th>p1227</th>
<th>Zero speed detection monitoring time / n_standst t_monit</th>
</tr>
</thead>
</table>
| SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN | **Can be changed:** U, T  
**Data type:** FloatingPoint32  
**P-Group:** Functions  
**Not for motor type:** -  
**Min:** 0.000 [s]  
**Max:** 300.000 [s]  
**Factory setting:** 4.000 [s] |

**Description:**
Sets the monitoring time for the standstill identification.

When braking with OFF1 or OFF3, standstill is identified after this time has expired, after the setpoint speed has fallen below p1226 (also refer to p1145).

After this, the brake control is started, the system waits for the closing time in p1217 and then the pulses are suppressed.

**Dependency:**
Refer to: p1215, p1216, p1217, p1226

**Notice:**
For p1145 > 0.0 (RFG tracking) the setpoint is not equal to zero dependent on the selected value. This can therefore cause the monitoring time in p1227 to be exceeded. In this case, for a driven motor, the pulses are not suppressed.

**Note:**
Standstill is identified in the following cases:
- the speed actual value falls below the speed threshold in p1226 and the time started after this in p1228 has expired.
- the speed setpoint falls below the speed threshold in p1226 and the time started after this in p1227 has expired.

For p1227 = 300.000 s, the following applies:
Monitoring is de-activated.
For p1227 = 0.000 s, the following applies:
With OFF1 or OFF3 and a ramp-down time = 0, the pulses are immediately suppressed and the motor "coasts" down.

<table>
<thead>
<tr>
<th>p1228</th>
<th>Pulse suppression delay time / Pulse suppr t_del</th>
</tr>
</thead>
</table>
| SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN | **Can be changed:** U, T  
**Data type:** FloatingPoint32  
**P-Group:** Functions  
**Not for motor type:** -  
**Min:** 0.000 [s]  
**Max:** 299.000 [s]  
**Factory setting:** 0.000 [s] |

**Description:**
Sets the delay time for pulse suppression.

After OFF1 or OFF3 and zero speed detection, the system waits for this time to expire and the pulses are then suppressed.

**Dependency:**
Refer to: p1226, p1227

**Notice:**
If the motor holding brake is activated, the pulse suppression is only conducted if this delay time (p1228) and then the closing time for the brake (p1217) have elapsed.

**Note:**
Standstill is identified in the following cases:
- the speed actual value falls below the speed threshold in p1226 and the time started after this in p1228 has expired.
- the speed setpoint falls below the speed threshold in p1226 and the time started after this in p1227 has expired.
### r1229.1...11

**CO/BO: Motor holding brake status word / Brake ZSW**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Data type</th>
<th>P-Group</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>r1229.1</td>
<td>Displays the status word for the motor holding brake.</td>
<td>Unsigned32</td>
<td>Functions</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>r1229.2</td>
<td>- Command open brake (continuous signal)</td>
<td>Yes</td>
<td>Yes</td>
<td>0</td>
<td>No</td>
<td>2711</td>
</tr>
<tr>
<td>r1229.3</td>
<td>- Pulse enable, extended brake control</td>
<td>Yes</td>
<td>Yes</td>
<td>0</td>
<td>No</td>
<td>2711</td>
</tr>
<tr>
<td>r1229.4</td>
<td>- Brake does not open</td>
<td>Yes</td>
<td>Yes</td>
<td>0</td>
<td>No</td>
<td>2711</td>
</tr>
<tr>
<td>r1229.5</td>
<td>- Brake does not close</td>
<td>Yes</td>
<td>Yes</td>
<td>0</td>
<td>No</td>
<td>2711</td>
</tr>
<tr>
<td>r1229.6</td>
<td>- Brake threshold exceeded</td>
<td>Yes</td>
<td>Yes</td>
<td>0</td>
<td>No</td>
<td>2707</td>
</tr>
<tr>
<td>r1229.7</td>
<td>- Brake threshold undershot</td>
<td>Yes</td>
<td>Yes</td>
<td>0</td>
<td>No</td>
<td>2704</td>
</tr>
<tr>
<td>r1229.8</td>
<td>- Brake monitoring time expired</td>
<td>Yes</td>
<td>Yes</td>
<td>0</td>
<td>No</td>
<td>2707</td>
</tr>
<tr>
<td>r1229.9</td>
<td>- Pulse enable request missing/n_ctrl inhibited</td>
<td>Yes</td>
<td>Yes</td>
<td>0</td>
<td>No</td>
<td>2707</td>
</tr>
<tr>
<td>r1229.10</td>
<td>- Brake OR logic operation result</td>
<td>Yes</td>
<td>Yes</td>
<td>0</td>
<td>No</td>
<td>2707</td>
</tr>
<tr>
<td>r1229.11</td>
<td>- Brake AND logic operation result</td>
<td>Yes</td>
<td>Yes</td>
<td>0</td>
<td>No</td>
<td>2707</td>
</tr>
</tbody>
</table>

### p1230[0...n]

**BI: Armature short-circuit / DC braking activation / ASC/DCBRK act**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Data type</th>
<th>P-Group</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p1230[0]</td>
<td>Sets the signal source to activate the armature short-circuit or DC braking.</td>
<td>Unsigned32 / Binary</td>
<td>Functions</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>p1230[1]</td>
<td>Refer to: p1231, p1232, p1233, p1234, p1235, p1236, p1237, r1238, r1239, p1345, p1346</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>p1230[2]</td>
<td>1 signal: Armature short-circuit/DC braking activated.</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>p1230[3]</td>
<td>0 signal: Armature short-circuit/DC braking de-activated.</td>
<td>-</td>
<td>-</td>
<td>-</td>
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</tr>
</tbody>
</table>

### p1231[0...n]

**Armature short-circuit / DC braking configuration / ASC/DCBRK config**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Data type</th>
<th>P-Group</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p1231[0]</td>
<td>Setting to activate the various types for armature short-circuit / DC braking.</td>
<td>Integer16</td>
<td>Functions</td>
<td>0</td>
<td>14</td>
<td>0</td>
</tr>
<tr>
<td>p1231[1]</td>
<td>0: No function</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>p1231[2]</td>
<td>1: External armature short-circuit with contactor feedback signal</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>p1231[3]</td>
<td>2: Ext. armature short circuit without contactor feedback signal</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>p1231[4]</td>
<td>4: DC braking</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>p1231[5]</td>
<td>5: DC braking for OFF1/OFF3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>p1231[6]</td>
<td>14: DC braking below starting speed</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>p1231[7]</td>
<td>Refer to: p0300, p1230, p1232, p1233, p1234, p1235, p1236, p1237, r1238, r1239, p1345, p1346</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>p1231[8]</td>
<td>Refer to: p1231 = 1, 2:</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>p1231[9]</td>
<td>- only short-circuit-proof motors may be used, or suitable resistors must be used to short-circuit the motor</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
Note:

Re p1231 = 1, 2:
The external armature short circuit can only be selected for synchronous motors (p0300). In this case, control bit BO: r1239.0 must be interconnected (e.g. to a digital input) to control the external contactor.
The external armature short circuit cannot be set as a fault response. It can be triggered via binector input p1230. It is also always activated in the case of pulse suppression.

Re p1231 = 4:
The function is activated as soon as the activation criterion is fulfilled.
- the function can be initiated by OFF2
  a) This function is not supported for synchronous motors (p0300 = 2xx, 4xx).
  b) For induction motors (p0300 = 1xx), the DC braking is initiated.

Activation criterion (one of the following criteria is fulfilled):
- binector input p1230 = 1 signal (DC braking activation).
- the drive is not in the state "S4: Operation" or in S5x (refer to function diagram 2610).
- the internal pulse enable is missing (r0046.19 = 0).

Re p1231 = 5:
DC braking can only be set for induction motors.
DC braking is activated if the OFF1 or OFF3 command is present. Binector input p1230 is ineffective. If the drive speed still lies above the speed threshold p1234, then initially, the drive is ramped-down to this threshold, demagnetized (see p0347) and is then switched into DC braking for the time set in p1233. After this, the drive is switched-off. If, at OFF1/OFF3, the drive speed is below p1234, then it is immediately demagnetized and switched into DC braking. A change is made into normal operation if the OFF1 command is withdrawn prematurely.
DC braking by means of fault response continues to be possible.

Re p1231 = 14:
DC braking can only be set for induction motors.
DC braking is initiated if binector input p1230 = 1 during operation and the actual speed is below the starting speed p1234 (before this, the drive must have operated above p1234 plus the hysteresis). Then, following upstream demagnetization (see p0347), the braking current p1232 is injected for the time set in p1233. The drive then changes into normal operation. During braking the command for DC braking can be withdrawn. If the time p1233 is exceeded, then DC braking is inhibited and the drive changes into normal operation.
For OFF1 and OFF3, DC braking is only executed, if binector input p1230 = 1 signal.
DC braking by means of fault response continues to be possible.

Re p1231 = 4, 5, 14:
The value can only be changed to values not equal to 4 or 14 if p0491 is not equal to 4 and p2101 is not equal to 6 (armature short circuit/DC braking not set).

Note:
ASC: Armature Short Circuit
DCBRK: DC Braking

### p1232[0...n]

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
</tr>
</thead>
</table>

**Description:**
Sets the braking current for DC braking.

**Dependency:**
Refer to: p1230, p1231, p1233, p1234, r1239, p1345, p1346

**Note:**
A change to the braking current becomes effective the next time that DC braking is switched-on.

The value for p1232 is specified as an rms value in the 3-phase system. The magnitude of the braking current is the same as that of an identical output current at frequency zero (see r0067, r0068, p0640). The braking current is internally limited to r0067.

<table>
<thead>
<tr>
<th>DC braking, braking current / DCBRK I_brake</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Can be changed: U, T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type: FloatingPoint32</td>
</tr>
<tr>
<td>P-Group: Functions</td>
</tr>
<tr>
<td>Not for motor type: PEM, REL, FEM</td>
</tr>
<tr>
<td>Min</td>
</tr>
<tr>
<td>Max</td>
</tr>
<tr>
<td>0.00 [Arms]</td>
</tr>
<tr>
<td>10000.00 [Arms]</td>
</tr>
</tbody>
</table>

**Access level:** 1
**Dynamic index:** MDS, p0130
**Func. diagram:** 7017
**Units group:** -
**Unit selection:** -
**Scaling:** -
**Expert list:** 1
**Factory setting**

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SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3
### List of parameters

#### p1233[0...n] DC braking time / DCBRK time

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

<table>
<thead>
<tr>
<th>Can be changed:</th>
<th>U, T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type:</td>
<td>FloatingPoint32</td>
</tr>
<tr>
<td>P-Group:</td>
<td>Functions</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>PEM, REL, FEM</td>
</tr>
<tr>
<td>Min</td>
<td>0.0 [s]</td>
</tr>
<tr>
<td>Max</td>
<td>3600.0 [s]</td>
</tr>
</tbody>
</table>

**Description:** Sets the DC braking time (as fault response).

**Dependency:** Refer to: p1230, p1231, p1232, p1234, r1239

**Note:**
- The time set is also effective when parameterizing DC braking as fault response.
- If a speed encoder is being used, DC braking is ended as soon as the drive falls below the standstill threshold (p1226).

#### p1234[0...n] Speed at the start of DC braking / DCBRK n_start

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

<table>
<thead>
<tr>
<th>Can be changed:</th>
<th>U, T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type:</td>
<td>FloatingPoint32</td>
</tr>
<tr>
<td>P-Group:</td>
<td>Functions</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>PEM, REL, FEM</td>
</tr>
<tr>
<td>Min</td>
<td>0.00 [rpm]</td>
</tr>
<tr>
<td>Max</td>
<td>210000.00 [rpm]</td>
</tr>
</tbody>
</table>

**Description:** Sets the starting speed for DC braking.

**Dependency:** Refer to: p1230, p1231, p1232, p1233, r1239

**Caution:**
- If an encoder fault occurs during closed-loop operation with an encoder, controlled deceleration of the drive down to the start speed p1234 can no longer take place. In this case, DC braking is activated immediately and injects the braking current p1232 for the braking time p1233 after de-magnetizing. The braking current and braking duration must, therefore, be dimensioned accordingly for this situation so that the drive can be decelerated to standstill.
- In the case of operation with an encoder, this speed may not be set too low so as to ensure that the oscillation movement induced by the residual flux/remanence of the motor does not cause DC braking to be de-activated again.

#### p1235[0...n] BI: External armature short-circuit, contactor feedback signal / ASC ext feedback

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

<table>
<thead>
<tr>
<th>Can be changed:</th>
<th>T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type:</td>
<td>Unsigned32 / Binary</td>
</tr>
<tr>
<td>P-Group:</td>
<td>Functions</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
</tr>
<tr>
<td>Min</td>
<td>-</td>
</tr>
<tr>
<td>Max</td>
<td>0</td>
</tr>
</tbody>
</table>

**Description:** Sets the signal source for the contactor feedback signal for external armature short-circuit.

**Dependency:** Refer to: p1230, p1231, p1232, p1233, p1234, r1239

**Notice:**
- In order that the pulses are not enabled when the contactor is closed, the contactor feedback signal must lag by a sufficiently long time when opening the contactor.

**Note:**
- 1 signal: The contactor is closed.
- 0 signal: The contactor is open.

#### p1236[0...n] Ext. armature short-cct., contactor feedback signal monit. time / ASC ext t_monit

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

<table>
<thead>
<tr>
<th>Can be changed:</th>
<th>U, T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type:</td>
<td>FloatingPoint32</td>
</tr>
<tr>
<td>P-Group:</td>
<td>Functions</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
</tr>
<tr>
<td>Min</td>
<td>0 [ms]</td>
</tr>
<tr>
<td>Max</td>
<td>1000 [ms]</td>
</tr>
</tbody>
</table>

**Description:** Sets the monitoring time of the contactor feedback signal for the external armature short-circuit configuration.
If the contactor feedback signal (p1235) is parameterized, then the appropriate feedback signal (r1239.1) is expected within this monitoring time after either opening or closing the contactor.

**Dependency:**
Refer to: p1230, p1231, p1235, p1237, r1239
Refer to: A07904, F07905

### p1237[0...n] External armature short-circuit, delay time when opening / ASC ext t_wait

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
<th>Dependency</th>
<th>Notice</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN,</td>
<td></td>
<td>Sets the delay time when opening the contactor of the external armature short-circuit.</td>
<td>Refer to: p1230, p1231, p1235, p1236, r1239</td>
<td>This delay time must be at least long enough so that the contactor contacts reliably open before the pulses are switched in. The delay time must be greater than the contactor response time. The Motor Module can be damaged if the delay time is too short.</td>
</tr>
<tr>
<td>SERVO_S110-DP,</td>
<td></td>
<td>If no contactor feedback signal has been selected (p1235), then the system waits for this time before the pulses are switched in.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-PN</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Data type:** FloatingPoint32

**Dynamic index:** MDS, p0130

**Units group:** -

**Unit selection:** -

**Access level:** 1

**Description:**
Sets the delay time when opening the contactor of the external armature short-circuit.

**Dependency:**
Refer to: p1230, p1231, p1235, p1236, r1239

---

### r1238 CO: Armature short-circuit, external state / EASC state

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
</table>
| SERVO_S110-CAN, |       | Displays the state for the external armature short-circuit. | Refer to: p1230, p1231, p1235, p1236, p1237, r1239 | Activation criterion (one of the following criteria is fulfilled):
- the signal at BI: p1230 (armature short-circuit activation) is 0.
- the drive is not in the state "S4: Operation" or in S5x (refer to function diagram 2610).
- the internal pulse enable is missing (r0046.19 = 0).
Re state "switched out" (r1238 = 0):
- the external armature short-circuit can be selected with p1231 = 1.
Re state "ready" (r1238 = 1):
- as soon as the activation criterion is fulfilled, then a transition is made into the state "active" (r1238 = 2).
Regarding the state "active" (r1238 = 2), "active - feedback signal "Closed" OK" (r1238 = 3), "active - feedback signal "Closed" missing" (r1238 = 4): |

**Data type:** Integer16

**Dynamic index:** -

**Units group:** -

**Unit selection:** -

**Access level:** 1

**Description:**
Displays the state for the external armature short-circuit.

**Dependency:**
Refer to: p1230, p1231, p1235, p1236, p1237, r1239

---

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN,</td>
<td></td>
<td></td>
<td>Refer to: A07904, F07905</td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-DP,</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-PN</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Data type:** -

**Dynamic index:** -

**Units group:** -

**Unit selection:** -

**Expert list:** 1

**Min Max Factory setting**
0 6 200 [ms]

---

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SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3
Re state "prompt to remove the armature short-circuit" (r1238 = 5):
- the activation criterion is no longer fulfilled. An attempt is made to again remove the armature short circuit.
- the control signal to close the contactor r1239.0 is set to "0" (open) and the pulses remain suppressed.
- if a contactor feedback signal is not connected (Bl: p1235 = 0 signal), the system waits for the delay time (p1237) to expire until a transition is made into state 1.
- if a contactor feedback signal is connected, the system waits until the feedback signal at Bl:p1235 goes to "0" (open) until a transition is made into state 1. If this does not occur within the monitoring time (p1236), then a transition is made into state 6.

Re state "active - feedback signal "Open" missing" (r1238 = 6):
- this error state can be exited by de-selecting the external armature short-circuit (p1231 = 0).

### r1239.0...13
**CO/BO: Armature short-circuit / DC braking status word / ASC/DCBRK ZSW**

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

<table>
<thead>
<tr>
<th>Bit field</th>
<th>Description</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>External armature short-circuit</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>01</td>
<td>External armature short-circuit, contactor feedback signal</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>02</td>
<td>External armature short-circuit ready</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>03</td>
<td>External armature short-circuit with contactor feedback signal</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>04</td>
<td>Internal armature short-circuit</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>05</td>
<td>Internal armature short circuit, feedback signal from power unit</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>06</td>
<td>Internal armature short-circuit ready</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>08</td>
<td>DC braking active</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>DC braking ready</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>11</td>
<td>Armature short circuit/DC braking selected</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>12</td>
<td>DC braking selection internally inhibited</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>13</td>
<td>DC braking for OFF1/OFF3</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>

**Dependency:**
Refer to: p1230, p1231, p1232, p1233, p1234, p1235, p1236, p1237

**Note:**
External armature short-circuit (bits 0 ... 3):
- Re bit 00:
  Using this signal, the motor is short-circuited through an external contactor circuit. This means that this BO: p1239.0 must be interconnected e.g. to a digital output.
- Re bit 01:
  This signal indicates the state of the contactor to establish the armature short-circuit. To do this, Bl: p1235 must be interconnected to a digital input.
- Re bit 02:
  The external armature short-circuit configuration is ready and is activated as soon as the activation criterion is fulfilled.
- Re bit 03:
  1: A feedback signal from an external contactor was parameterized in Bl: p1235.
  Internal voltage protection / internal armature short-circuit (bits 4 ... 6):
- Re bit 04:
  a) Internal voltage protection (p1231 = 3) was selected and the Motor Module does not support the autonomous internal voltage protection (r0192.10 = 0).
  The Control Unit issues the command to the Motor Module to short-circuit the motor through the power semiconductors.
  b) Internal voltage protection (p1231 = 3) was selected and the Motor Module supports the autonomous internal voltage protection (r0192.10 = 1).
The Motor Module decides autonomously whether the armature short-circuit is activated. In this case, the following applies: $r_{1239.4} = r_{1239.5}$.

c) Internal armature short-circuit ($p_{1231} = 4$) was selected.

The Control Unit issues the command to the Motor Module to short-circuit the motor through the power semiconduc-

tors.

Re bit 05:

The Motor Module signals that the motor is short-circuited in the Motor Module through the power semiconductors.

Re bit 06:

a) Internal voltage protection ($p_{1231} = 3$) was selected and the Motor Module does not support the autonomous internal voltage protection ($r_{0192.10} = 0$).

The internal voltage protection is ready and is activated as soon as the activation criterion is fulfilled.

a) Internal voltage protection ($p_{1231} = 3$) was selected and the Motor Module supports the autonomous internal voltage protection ($r_{0192.10} = 1$).

The internal voltage protection is ready and the Motor Module decides autonomously - using the DC link voltage - whether the short-circuit is activated. In this case, protection is also provided even if the DRIVE-CLiQ connection between the Control Unit and Motor Module was interrupted. The short-circuit is activated if the DC link voltage exceeds 800 V. If the DC link voltage falls below 450 V, then the short-circuit is withdrawn.

c) Internal armature short-circuit ($p_{1231} = 4$) was selected.

The internal armature short-circuit is ready and is activated as soon as the activation criterion is fulfilled.

Activation criterion (one of the following criteria is fulfilled):
- the signal at BI: $p_{1230}$ (armature short-circuit activation) is 1.
- the drive is not in the state "S4: Operation" or in S5x (refer to function diagram 2610).
- the internal pulse enable is missing ($r_{0046.19} = 0$).

Re bit 12, 13:

Only effective for $p_{1231} = 14$.

\[\text{p1240}[0...n]\]

**Vdc controller or Vdc monitoring configuration / Vdc_ctrl config**

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

**Can be changed:** U, T

**Data type:** Integer16

**P-Group:** Functions

**Not for motor type:** REL

**Min**

**Calculated:** -

**Dynamic index:** DDS, p0180

**Units group:** -

**Scaling:** -

**Func. diagram:** 3082, 5650

**Expert list:** 1

**Description:** Sets the configuration of the controller or monitoring for the DC link voltage (Vdc).

**Value:**

0: Inhib Vdc ctrl
1: Vdc_max controller enable
2: Vdc_min controller (kinetic buffering) enable
3: Vdc_min controller and Vdc_max controller enable
4: Activates Vdc_max monitoring
5: Activates Vdc_min monitoring
6: Activates Vdc_min monitoring and Vdc_max monitoring
7: Vdc_max controller without accelerating enable
8: Vdc_min controller without braking enable
9: Vdc_min and Vdc_max controller w/o braking/accelerating enable

**Dependency:** Refer to: p1244, p1248, p1250, p1532

**Notice:** During a few steps of the rotating measurement ($p_{1960} = 1$) the Vdc_min controller and/or Vdc_max controller is disabled.

**Note:**

```
p1240 = 1, 3:
```

When the upper DC link voltage threshold is reached ($p_{1244}$), then the following applies:
- the Vdc_max controller limits the regenerative energy in order that the DC link voltage is kept below the maximum DC link voltage when braking.
- when other drives regenerate into the DC link, then the Vdc_max controller causes the motor to accelerate.
Parameter

List of parameters

p1240 = 2, 3:
When the lower DC link voltage threshold is reached (p1248), the following applies:
- the Vdc_min controller limits the energy taken from the DC link in order to keep the DC link voltage above the minimum DC link voltage when accelerating.
- the motor is braked in order to use its kinetic energy to buffer the DC link.
p1240 = 4, 5, 6:
When the threshold in p1244 or p1248 is reached, the DC link voltage monitoring initiates a fault with a response and therefore reduces additional negative effects on the DC link voltage.
p1240 = 7, 9:
As for p1240 = 1, 3. However, the motor is prevented from accelerating due to the fact that other drives are regenerating. The effective lower torque limit cannot exceed the offset of the torque limit (p1532).
p1240 = 8, 9:
As for p1240 = 2, 3. However, the motor is prevented from braking due to the fact that the DC link voltage has been lowered. The effective upper torque limit cannot be less than the offset of the torque limit (p1532).

<table>
<thead>
<tr>
<th>Parameter</th>
<th>DC link voltage threshold upper / Vdc upper thresh</th>
</tr>
</thead>
<tbody>
<tr>
<td>p1244</td>
<td>Can be changed: U, T</td>
</tr>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Calculated: CALC_MOD_CON Access level: 3</td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td>Dynamic index: DDS, p0180 Func. diagram: 5650</td>
</tr>
<tr>
<td>P-Group: Functions</td>
<td>Units group: - Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type: REL</td>
<td>Scaling: - Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td>165 [V]</td>
<td>1200 [V]</td>
</tr>
<tr>
<td>750 [V]</td>
<td></td>
</tr>
</tbody>
</table>

Description: Sets the upper threshold for the DC link voltage.
For p1240 = 1, 3, 7, 9, this threshold is used as limit setpoint for the Vdc_max controller.
For p1240 = 4, 6, for DC link voltages above this threshold, an appropriate fault is output.

Dependency: Refer to: p1240, p1248, p1250

Note: For p1244 < 1.07 * "parameterized DC link voltage" input of values is rejected.
For p0204.0 = 1, the following applies:
"Parameterized DC link voltage" = p0210
For p0204.0 = 0, the following applies:
"Parameterized DC link voltage" = p0210 * 1.4142

<table>
<thead>
<tr>
<th>Parameter</th>
<th>DC link voltage threshold lower / Vdc lower thresh</th>
</tr>
</thead>
<tbody>
<tr>
<td>p1248</td>
<td>Can be changed: U, T</td>
</tr>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Calculated: CALC_MOD_CON Access level: 3</td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td>Dynamic index: DDS, p0180 Func. diagram: 5650</td>
</tr>
<tr>
<td>P-Group: Functions</td>
<td>Units group: - Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type: REL</td>
<td>Scaling: - Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td>100 [V]</td>
<td>1000 [V]</td>
</tr>
<tr>
<td>450 [V]</td>
<td></td>
</tr>
</tbody>
</table>

Description: Sets the lower threshold for the DC link voltage.
For p1240 = 2, 3, 8, 9, this threshold is used as limit setpoint for the Vdc_min controller.
For p1240 = 5, 6, for DC link voltages below this threshold, an appropriate fault is output.

Dependency: Refer to: p1240, p1244, p1250

Note: For p1244 > 0.93 * "parameterized DC link voltage" input of values is rejected.
For p0204.0 = 1, the following applies:
"Parameterized DC link voltage" = p0210
For p0204.0 = 0, the following applies:
"Parameterized DC link voltage" = p0210 * 1.4142
## List of parameters

### p1250[0...n] Vdc controller proportional gain / Vdc_ctrl Kp

| Description | Sets the proportional gain for the DC-link voltage controller (Vdc_min controller, Vdc_max controller). |
| Dependency | Sets the proportional gain for the DC-link voltage controller (Vdc_min controller, Vdc_max controller). |

#### Parameter details:
- **Can be changed:** U, T
- **Data type:** FloatingPoint32
- **Units group:** 19_1
- **Expression:** CALC_MOD_CON
- **Access level:** 3

#### Data fields:
- **Min:** 0.00 [AV]
- **Max:** 10.00 [AV]
- **Expert list:** 1

#### Factory setting:
- **U, T**

### p1275 Motor holding brake control word / Brake STW

| Description | Sets the control word for the motor holding brake. |
| Dependency | Sets the control word for the motor holding brake. |

#### Parameter details:
- **Can be changed:** U, T
- **Data type:** Unsigned32
- **Units group:** -
- **Expression:** -
- **Access level:** 2

#### Data fields:
- **Min:** -
- **Max:** -
- **Expert list:** 1

#### Factory setting:
- **0000 0000 bin**

### p1276 Motor holding brake, standstill detection, bypass / Brk standst bypass

| Description | Sets the delay time for closing the brake at standstill. |
| Dependency | Sets the delay time for closing the brake at standstill. |

#### Parameter details:
- **Can be changed:** U, T
- **Data type:** FloatingPoint32
- **Units group:** -
- **Expression:** -
- **Access level:** 2

#### Data fields:
- **Min:** 0.000 [s]
- **Max:** 300.000 [s]
- **Expert list:** 1

#### Factory setting:
- **300.000 [s]**

### p1277 Motor holding brake, braking threshold delay exceeded / Del thresh exceed.

| Description | Sets the delay time for the signal "braking threshold exceeded" (BO: r1229.6). |
| Dependency | Sets the delay time for the signal "braking threshold exceeded" (BO: r1229.6). |

#### Parameter details:
- **Can be changed:** U, T
- **Data type:** FloatingPoint32
- **Units group:** -
- **Expression:** -
- **Access level:** 2

#### Data fields:
- **Min:** 0.000 [s]
- **Max:** 300.000 [s]
- **Expert list:** 1

#### Factory setting:
- **0.000 [s]""
### p1278 Brake control, diagnostics evaluation / Brake diagnostics

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p1278</td>
<td>Sets the brake control type (with or without diagnostics evaluation).</td>
<td>0: Brake control with diagnostics evaluation</td>
<td>If the configuration of the motor holding brake (p1215) is set to &quot;no holding brake present&quot; when booting, then an automatic identification of the motor holding brake will be carried out. If a brake control is detected without diagnostics evaluation (e.g. Brake Relay for AC Drive), then the parameter is set to &quot;brake control without diagnostics evaluation&quot;. It is not permissible to parameterize &quot;brake control without diagnostics evaluation&quot; and also enable &quot;safe brake control&quot; (p1278 = 1, p9602 = 1, p9802 = 1).</td>
</tr>
</tbody>
</table>

#### SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

- **Data type:** Integer16
- **P-Group:** Functions
- **Not for motor type:** -
- **Calculation:** -
- **Dynamic index:** -
- **Units group:** -
- **Scaling:** -
- **Expert list:** 1
- **Min:** 0
- **Max:** 1
- **Factory setting:** 0

#### Value:
- **0:** Brake control with diagnostics evaluation
- **1:** Brake control without diagnostics evaluation

### p1279[0...3] BI: Motor holding brake, OR/AND logic operation / Brake OR AND

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p1279</td>
<td>Sets the signal source for the OR/AND logic operation.</td>
<td>0: OR logic operation, input 1 --&gt; the result is displayed in r1229.10.</td>
<td></td>
</tr>
</tbody>
</table>

#### SERVO_S110-CAN (Extended brk), SERVO_S110-DP (Extended brk), SERVO_S110-PN (Extended brk)

- **Data type:** Unsigned32 / Binary
- **P-Group:** Functions
- **Not for motor type:** -
- **Calculation:** -
- **Dynamic index:** -
- **Units group:** -
- **Scaling:** -
- **Expert list:** 1
- **Min:** -
- **Max:** -
- **Factory setting:** 0

#### Description:
Refer to: r1229

#### Note:
[0]: OR logic operation, input 1 --> the result is displayed in r1229.10.
[1]: OR logic operation, input 2 --> the result is displayed in r1229.10.
[2]: AND logic operation, input 1 --> the result is displayed in r1229.11.
[3]: AND logic operation, input 2 --> the result is displayed in r1229.11.

### p1300[0...n] Open-loop/closed-loop control operating mode / Op/cl-lp ctrl_mode

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p1300</td>
<td>Sets the open and closed-loop control mode of a drive.</td>
<td>20: Speed control (encoderless)</td>
<td></td>
</tr>
</tbody>
</table>

#### SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

- **Data type:** Integer16
- **P-Group:** V/f open-loop control
- **Not for motor type:** -
- **Calculation:** -
- **Units group:** -
- **Scaling:** -
- **Expert list:** 1
- **Min:** 20
- **Max:** 23
- **Factory setting:** 21

#### Value:
- **20:** Speed control (encoderless)
- **21:** Speed control (with encoder)
- **23:** Torque control (with encoder)

#### Description:
Sets the open and closed-loop control mode of a drive.

#### Dependency:
Closed-loop speed or torque control (with encoder) cannot be selected if the encoder type is not entered (p0400).

#### Notice:
General conditions for encoderless operation can be found in the following literature:
SINAMICS S120 Function Manual Drive Functions
Note:
The closed-loop torque control can only be changed over in operation (p1300 = 20, 21) by selecting the closed-loop speed control (p1501). At the changeover, the setting of p1300 does not change. In this case, the actual state is displayed in r1407, bit 2 and bit 3.

For encoderless operation (p1404 = 0 or p1300 = 20), the following applies:
- The following condition must be fulfilled: p1800 >= n / (2 * p0115[0]), n = 1, 2, ...
- For motors with a small power rating (< 300 W) we recommend to set n >= 2.

### p1317[0...n] U/f control activation / Uf act

- **SERVO_S110-CAN**,  **SERVO_S110-DP**,  **SERVO_S110-PN**
- **Can be changed:** T
- **Data type:** Integer16
- **P-Group:** -
- **Units group:** -
- **Not for motor type:** -
- **Min:** 0
- **Max:** 1
- **Factory setting:** 0

**Description:** Setting to activate the U/f control with linear characteristic.

**Value:**
- 0: De-activated (p1300 effective)
- 1: Activated

**Dependency:** Ref to: p1318, p1319, p1326, p1327

**Note:** The following applies for firmware version 4.3 and higher:
When U/f control is activated, resonance damping is automatically activated. The resonance damping must be deactivated (p1338 = 0) in order to obtain pure diagnostics operation without the influence of actual values.
Further, when U/f control is activated, the following functions are active:
- Vdc controller (p1240, p1244, p1248, p1250).
- the up ramp is limited by the set M, P and I limits (p0326, p0341, p0342, p0640, p1520, p1521, p1530, p1531, p1498).
- the ramp-function generator is held if the current actual value exceeds the current limit set in p0640.

### p1318[0...n] U/f control ramp-up/ramp-down time / Uf t_rmp-up_rmp-dn

- **SERVO_S110-CAN**,  **SERVO_S110-DP**,  **SERVO_S110-PN**
- **Can be changed:** U, T
- **Data type:** FloatingPoint32
- **P-Group:** V/f open-loop control
- **Units group:** -
- **Not for motor type:** -
- **Min:** 0.000 [s]
- **Max:** 999999.000 [s]
- **Factory setting:** 10.000 [s]

**Description:** Sets the ramp-up and ramp-down time for the U/f control.

**Dependency:**
- Refer to: p1317, p1319, p1326, p1327

**Note:** The ramp-function generator requires this time to reach the maximum speed (p1082) from zero.
This ramp is used for stall protection and operates independently of any ramp-function generator that might have been configured.

### p1319[0...n] U/f control voltage at zero frequency / Uf U at f=0 Hz

- **SERVO_S110-CAN**,  **SERVO_S110-DP**,  **SERVO_S110-PN**
- **Can be changed:** U, T
- **Data type:** FloatingPoint32
- **P-Group:** V/f open-loop control
- **Units group:** -
- **Not for motor type:** -
- **Min:** 0.0 [Vrms]
- **Max:** 50.0 [Vrms]
- **Factory setting:** 0.0 [Vrms]

**Description:** The linear characteristic for the U/f control is defined by 0 Hz / p1319 and p1326 / p1327.
This parameter specifies the voltage for a frequency of 0 Hz.

**Dependency:**
- The U/f control is activated via p1317 = 1.
- Refer to: p1317, p1326, p1327

**Note:** Linear interpolation is carried out between the points 0 Hz/p1319 and p1326/p1327.
### p1326[0...n] U/f control characteristic frequency / Uf char f4

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p1326</td>
<td>FloatingPoint32</td>
<td>0.00 [Hz]</td>
<td>10000.00 [Hz]</td>
<td>0.00 [Hz]</td>
</tr>
</tbody>
</table>

**Description:**
The linear characteristic for the U/f control is defined by 0 Hz / p1319 and p1326 / p1327.

**Dependency:**
The U/f control is activated via p1317 = 1.

**Note:**
Linear interpolation is carried out between the points 0 Hz/p1319 and p1326/p1327.

### p1327[0...n] U/f control characteristic voltage / Uf char U4

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p1327</td>
<td>FloatingPoint32</td>
<td>0.0 [Vrms]</td>
<td>10000.0 [Vrms]</td>
<td>0.0 [Vrms]</td>
</tr>
</tbody>
</table>

**Description:**
The linear characteristic for the U/f control is defined by 0 Hz / p1319 and p1326 / p1327.

**Dependency:**
The U/f control is activated via p1317 = 1.

**Note:**
Linear interpolation is carried out between the points 0 Hz/p1319 and p1326/p1327.

### p1338[0...n] U/f mode resonance damping gain / Uf Res_damp gain

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p1338</td>
<td>FloatingPoint32</td>
<td>0.00</td>
<td>100.00</td>
<td>1.00</td>
</tr>
</tbody>
</table>

**Description:**
Sets the gain for resonance damping for U/f control.

In U/f mode, the resonance damping function dampens oscillations that are frequently experienced by induction motors in certain speed ranges and by synchronous motors above even low speeds.

**Dependency:**
Refer to: p1317, p1339, p1349

**Note:**
Resonance damping is active in the following ranges:
- Active: 3.1 Hz ... p1349
- Build-up (linear): 3.1 ... 4.77 Hz
- Reduction (linear): 0.95 * p1349 ... p1349
Where the value = 1 and at the oscillation amplitude of the rated current, the rated slip frequency is switched in for induction motors, while a frequency of 10 Hz is switched in for synchronous motors.

### p1339[0...n] U/f mode resonance damping filter time constant / Uf Res_damp T

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p1339</td>
<td>FloatingPoint32</td>
<td>1.00 [ms]</td>
<td>1000.00 [ms]</td>
<td>20.00 [ms]</td>
</tr>
</tbody>
</table>

**Description:**
Sets the filter time constant for resonance damping for U/f control.
Dependency:
Refer to: p1317, p1338, p1349

Note:
The filter time constant must be greater than the oscillation period of the oscillation to be dampened.

### p1345[0...n] DC braking proportional gain / DCBRK Kp

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed:</td>
<td>U, T</td>
</tr>
<tr>
<td>Data type:</td>
<td>FloatingPoint32</td>
</tr>
<tr>
<td>P-Group:</td>
<td>V/f open-loop control</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
</tr>
<tr>
<td>Min</td>
<td>0.000</td>
</tr>
<tr>
<td>Max</td>
<td>100000.000</td>
</tr>
<tr>
<td>Factory setting</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Description:
Sets the proportional gain for DC braking (p1230, p1231).

Dependency:
Refer to: p1346

Note:
Current controller adaptation is not effective for DC braking.

### p1346[0...n] DC braking, integral time / DCBRK Tn

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed:</td>
<td>U, T</td>
</tr>
<tr>
<td>Data type:</td>
<td>FloatingPoint32</td>
</tr>
<tr>
<td>P-Group:</td>
<td>V/f open-loop control</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
</tr>
<tr>
<td>Min</td>
<td>0.000 [ms]</td>
</tr>
<tr>
<td>Max</td>
<td>50.000 [ms]</td>
</tr>
<tr>
<td>Factory setting</td>
<td>0.030 [ms]</td>
</tr>
</tbody>
</table>

Description:
Sets the integral time for DC braking (p1230, p1231).

Dependency:
Refer to: p1346

Note:
For p1346 = 0, the following applies:
The integral time of DC braking is de-activated.

### p1349[0...n] U/f mode resonance damping maximum frequency / Uf res_damp f_max

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed:</td>
<td>U, T</td>
</tr>
<tr>
<td>Data type:</td>
<td>FloatingPoint32</td>
</tr>
<tr>
<td>P-Group:</td>
<td>V/f open-loop control</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
</tr>
<tr>
<td>Min</td>
<td>0.00 [Hz]</td>
</tr>
<tr>
<td>Max</td>
<td>3000.00 [Hz]</td>
</tr>
<tr>
<td>Factory setting</td>
<td>3000.00 [Hz]</td>
</tr>
</tbody>
</table>

Description:
Sets the maximum output frequency for resonance damping for U/f control. Resonance damping is inactive above this output frequency.

Dependency:
Refer to: p1338, p1339

Note:
Resonance damping is active in the following ranges:
- Active: 3.1 Hz ... p1349
- Build-up (linear): 3.1 ... 4.77 Hz
- Reduction (linear): 0.95 * p1349 ... p1349

### p1400[0...n] Speed control configuration / n_ctrl config

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed:</td>
<td>U, T</td>
</tr>
<tr>
<td>Data type:</td>
<td>Unsigned32</td>
</tr>
<tr>
<td>P-Group:</td>
<td>Closed-loop control</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>REL</td>
</tr>
<tr>
<td>Min</td>
<td>-</td>
</tr>
<tr>
<td>Max</td>
<td>-</td>
</tr>
<tr>
<td>Factory setting</td>
<td>0000 0000 0000 0000 0000 0000 0000 0000 0011 1010 0000 bin</td>
</tr>
</tbody>
</table>

Description:
Sets the configuration for the closed-loop speed control.
Parameter
List of parameters

<table>
<thead>
<tr>
<th>Bit field</th>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>03</td>
<td>Torque limiting active in motoring/regenerative mode</td>
<td>ON</td>
<td>OFF</td>
<td>5030</td>
<td></td>
</tr>
<tr>
<td>04</td>
<td>Kp/Tn adaptation active</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>05</td>
<td>Interpolation speed pre-control active</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>06</td>
<td>Interpolation torque setpoint active</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>07</td>
<td>Damping for encoderless open-loop controlled oper.</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>08</td>
<td>Speed pre-control</td>
<td>For balancing</td>
<td>Setpoint</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>09</td>
<td>Encoderless oper. speed actual value starting value</td>
<td>-</td>
<td>0.0</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Steady-state operation changeover</td>
<td>Steady-state</td>
<td>When accelerating</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Motor control depending on speed setpoint</td>
<td>Speed setpoint</td>
<td>Speed actual value</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>I component for limiting</td>
<td>Enable</td>
<td>Hold</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Moment of inertia estimator active</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

Note:

Re bit 07:
The interpolator is only effective for clock-cycle synchronous PROFIBUS operation and when the master receives a sign-of-life (STW 2.12 ... STW 2.15). Further, for active Dynamic Servo Control (DSC) an additional dead time of one speed controller clock cycle is obtained.

Re bit 10:
The pre-control signal via connector input p1430 only becomes effective at p1402.4 = 1 (torque-speed pre-control with encoder) at p1400.10 = 0 (for setp_filter 2).

Re bit 11:
If the motor rotates when the pulses are enabled, then we recommend p1400.11 = 1 (starting value = setpoint) with the matching sign.

Re bit 12:
If the motor remains stationary (zero speed) when the pulses are enabled, the we recommend p1400.11 = 0 (starting value = 0.0).

Re bit 18:
Only active when the "moment of inertia estimator" function module is active (r0108.10 = 1).

For operation with encoder, in addition, p1402.4 must be set to 1.

The result of the moment of inertia estimator is displayed in r1493 when the function is activated.

The function assumes that speed changes are made without load. If a speed change must be realized under load, then during this time, the estimated moment of inertia should be frozen using binector input p1502.

p1402[0...n] Closed-loop current control and motor model configuration / I_ctrl config

| SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN |
| Can be changed: | T |
| Calculated: | - |
| Access level: | 3 |
| Data type: | Unsigned16 |
| Dynamic index: | DDS, p0180 |
| Func. diagram: | - |
| P-Group: | Closed-loop control |
| Units group: | - |
| Unit selection: | - |
| Not for motor type: | - |
| Scaling: | - |
| Expert list: | 1 |
| Min | - | Max | - | Factory setting | 0000 0100 bin |

Description:
Sets the configuration for the closed-loop control and the motor model.

Bit field:

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Park encoder for n_act &gt; p1404</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>02</td>
<td>Current controller adaptation active</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>04</td>
<td>Torque-speed pre-control with encoder</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
</tbody>
</table>

Note:
Re bit 01:
When the bit is set, the encoder is parked as soon as the actual speed is greater than the changeover speed (p1404). The encoder state is indicated in r0481.14.
Re bit 02:
The current controller adaptation (p0391 ... p0393) is only calculated when the bit is set.

**p1404[0...n]**  
**Encoderless operation changeover speed / Encoderl op n_chg**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
<th>Notice</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN,</td>
<td>Can be changed: T Calculated: - Access level: 3</td>
<td>Sets the speed to change over between operation with and without an encoder.</td>
<td>Above this speed, the drive system is automatically operated in encoderless mode.</td>
<td>The changeover speed applies when changing over between operation with and without encoder.</td>
</tr>
<tr>
<td>SERVO_S110-DP,</td>
<td></td>
<td></td>
<td>With p1404 &gt; 0, the effective changeover speed is limited to values greater than or equal to p1755 in order to avoid controlled operation.</td>
<td>With p1404 &gt; 0, the effective changeover speed is limited to values greater than or equal to p1755 in order to avoid controlled operation.</td>
</tr>
<tr>
<td>SERVO_S110-PN</td>
<td>P-Group: Closed-loop control</td>
<td></td>
<td>Separate speed controllers should be set when operating with and without encoder.</td>
<td>For encoderless operation (p1404 = 0 or p1300 = 20), the following applies:</td>
</tr>
<tr>
<td></td>
<td>Data type: FloatingPoint32</td>
<td></td>
<td>- Operation with encoder: p1460 (Kp), p1462 (Tn), p1461, p1463, p1457, p1458 (speed controller adaptation)</td>
<td>- The condition must be fulfilled: p1800 &gt;= n / (2 * p0115[0]), n = 1, 2, ...</td>
</tr>
<tr>
<td></td>
<td>Dynamic index: DDS, p0180</td>
<td></td>
<td>- Operation without encoder: p1470 (Kp), p1472 (Tn)</td>
<td>- For motors with a small power rating (&lt; 300 W) we recommend to set n &gt;= 2.</td>
</tr>
<tr>
<td></td>
<td>Units group: 3_1 Unit selection: p0505</td>
<td></td>
<td>For encoderless operation (p1404 = 0 or p1300 = 20), the following applies:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Scaling: - Expert list: 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Min Max Factory setting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.00 [rpm] 210000.00 [rpm] 210000.00 [rpm]</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**r1406.8...12**  
**CO/BO: Control word speed controller / STW n_ctrl**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
<th>Bit field</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN,</td>
<td>Can be changed: - Calculated: - Access level: 3</td>
<td>Displays the control word of the speed controller.</td>
<td>Bit Signal name 1 signal 0 signal FP</td>
<td>Bit field</td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-DP,</td>
<td></td>
<td></td>
<td>08 Travel to fixed stop active Yes No</td>
<td>Bit</td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-PN</td>
<td></td>
<td></td>
<td>12 Torque control active Yes No</td>
<td>Bit</td>
<td></td>
</tr>
<tr>
<td></td>
<td>P-Group: Closed-loop control</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Data type: Unsigned16 Dynamic index: - Access level: 3</td>
<td></td>
<td></td>
<td>Bit field</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Units group: - Unit selection: -</td>
<td></td>
<td></td>
<td>Bit</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Scaling: - Expert list: 1</td>
<td></td>
<td></td>
<td>Bit</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Min Max Factory setting</td>
<td></td>
<td></td>
<td>Bit</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Bit</td>
<td></td>
</tr>
</tbody>
</table>

**r1407.0...13**  
**CO/BO: Status word speed controller / ZSW n_ctrl**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
<th>Bit field</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN,</td>
<td>Can be changed: - Calculated: - Access level: 3</td>
<td>Displays the status word of the speed controller.</td>
<td>Bit Signal name 1 signal 0 signal FP</td>
<td>Bit field</td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-DP,</td>
<td></td>
<td></td>
<td>00 U/f control active Yes No</td>
<td>Bit</td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-PN</td>
<td></td>
<td></td>
<td>01 Encoderless operation active Yes No</td>
<td>Bit</td>
<td></td>
</tr>
<tr>
<td></td>
<td>P-Group: Closed-loop control</td>
<td></td>
<td></td>
<td>Bit field</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Data type: Unsigned32 Dynamic index: - Access level: 3</td>
<td></td>
<td></td>
<td>Bit field</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Units group: - Unit selection: -</td>
<td></td>
<td></td>
<td>Bit field</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Scaling: - Expert list: 1</td>
<td></td>
<td></td>
<td>Bit field</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Min Max Factory setting</td>
<td></td>
<td></td>
<td>Bit field</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Bit field</td>
<td></td>
</tr>
</tbody>
</table>

**Description:**
- Bit field: Bit Signal name 1 signal 0 signal FP
- For encoderless operation (p1404 = 0 or p1300 = 20), the following applies:
  - The condition must be fulfilled: p1800 >= n / (2 * p0115[0]), n = 1, 2, ...
  - For motors with a small power rating (< 300 W) we recommend to set n >= 2.
**Parameter**
**List of parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Access level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>11 Speed setpoint limited</strong></td>
<td>Yes</td>
<td>No</td>
<td>Displays the current controller status word.</td>
</tr>
<tr>
<td><strong>13 Encoderless operation due to a fault</strong></td>
<td>Yes</td>
<td>No</td>
<td>The set current limit is taken into account in upstream torque limiting. Bits 6, 7, and 8 are, therefore, only set in the event of overshoots on account of the current setpoint filter.</td>
</tr>
</tbody>
</table>

**Note:**

Re bit 04:
The following conditions must be fulfilled to set to 1:
- CI: p1190 and CI: p1191 must be interconnected with a signal source that is not equal to zero.
- it is not permissible that OFF1, OFF3 or STOP2 are active.
- it is not permissible that the motor data identification is active.
- Master control must not be active.
The following conditions can mean that the DSC function is not active in spite of the fact that the bit is set:
- clock-cycle synchronous operation is not selected (r2054 not equal to 4).
- the PROFIBUS is not clock-cycle synchronous (r2064[0] not equal to 1).
- DSC is not switched on at the control side; this means that KPC = 0 is transferred as the value at CI: p1191.

<table>
<thead>
<tr>
<th>r1408.0...9</th>
<th>CO/BO: Status word current controller / ZSW I_ctrl</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SERVO_S110-CAN,</strong></td>
<td><strong>SERVO_S110-DP,</strong></td>
</tr>
<tr>
<td>Can be changed:</td>
<td>Calculated:</td>
</tr>
<tr>
<td>Data type: Unsigned16</td>
<td>Dynamic index:</td>
</tr>
<tr>
<td>P-Group: Closed-loop control</td>
<td>Units group:</td>
</tr>
<tr>
<td>Not for motor type: REL</td>
<td>Scaling:</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Description:**
Displays the current controller status word.

<table>
<thead>
<tr>
<th>Bit field:</th>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Closed-loop current control</td>
<td>Active</td>
<td>Not active</td>
<td></td>
<td></td>
</tr>
<tr>
<td>04</td>
<td>Limit Ud</td>
<td>Active</td>
<td>Not active</td>
<td></td>
<td></td>
</tr>
<tr>
<td>05</td>
<td>Limit Vq</td>
<td>Active</td>
<td>Not active</td>
<td></td>
<td></td>
</tr>
<tr>
<td>06</td>
<td>Positive limiting Iq</td>
<td>Active</td>
<td>Not active</td>
<td></td>
<td></td>
</tr>
<tr>
<td>07</td>
<td>Negative limiting Iq</td>
<td>Active</td>
<td>Not active</td>
<td></td>
<td></td>
</tr>
<tr>
<td>08</td>
<td>Limit iq_set</td>
<td>Active</td>
<td>Not active</td>
<td></td>
<td></td>
</tr>
<tr>
<td>09</td>
<td>Limit id_set</td>
<td>Active</td>
<td>Not active</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:**
The set current limit is taken into account in upstream torque limiting. Bits 6, 7, and 8 are, therefore, only set in the event of overshoots on account of the current setpoint filter.

<table>
<thead>
<tr>
<th>p1414[0...n]</th>
<th>Speed setpoint filter activation / n_set_filt_act</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SERVO_S110-CAN,</strong></td>
<td><strong>SERVO_S110-DP,</strong></td>
</tr>
<tr>
<td>Can be changed: U, T</td>
<td>Calculated:</td>
</tr>
<tr>
<td>Data type: Unsigned16</td>
<td>Dynamic index: DDS, p0180</td>
</tr>
<tr>
<td>P-Group: Closed-loop control</td>
<td>Units group:</td>
</tr>
<tr>
<td>Not for motor type: REL</td>
<td>Scaling:</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Description:**
Setting for activating/de-activating the speed setpoint filter.

**Recommend.:**
If only one filter is required, filter 1 should be activated and filter 2 de-activated, to avoid excessive processing time.

<table>
<thead>
<tr>
<th>Bit field:</th>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Activate filter 1</td>
<td>Yes</td>
<td>No</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Dependency:**
The individual speed setpoint filters are parameterized as of p1415.

<table>
<thead>
<tr>
<th>p1415[0...n]</th>
<th>Speed setpoint filter 1 type / n_set_filt 1 typ</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SERVO_S110-CAN,</strong></td>
<td><strong>SERVO_S110-DP,</strong></td>
</tr>
<tr>
<td>Can be changed: U, T</td>
<td>Calculated:</td>
</tr>
<tr>
<td>Data type: Integer16</td>
<td>Dynamic index: DDS, p0180</td>
</tr>
<tr>
<td>P-Group: Closed-loop control</td>
<td>Units group:</td>
</tr>
<tr>
<td>Not for motor type: REL</td>
<td>Scaling:</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td>0</td>
<td>2</td>
</tr>
</tbody>
</table>

**Description:**
Sets the type for speed setpoint filter 1.
### List of parameters

**Value:**
- 0: Low pass: PT1
- 1: Low pass: PT2
- 2: General 2nd-order filter

**Dependency:**
- PT1 low pass: p1416
- PT2 low pass: p1417, p1418
- General filter: p1417 ... p1420

#### p1416[0...n]
**Speed setpoint filter 1 time constant / n_set_filt 1 T**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Access level</th>
<th>Data type</th>
<th>Dynamic index</th>
<th>Func. diagram</th>
<th>Units group</th>
<th>Unit selection</th>
<th>Expert list</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p1416[0...n]</td>
<td>Can be changed: U, T</td>
<td>Calculated: -</td>
<td>FloatingPoint32</td>
<td>DDS, p0180</td>
<td>5020</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>0.00 [ms] 5000.00 [ms]</td>
</tr>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.00 [ms]</td>
</tr>
</tbody>
</table>

**Description:**
Sets the time constant for the speed setpoint filter 1 (PT1).

**Dependency:**
Refer to: p1414, p1415

**Note:**
This parameter is only effective if the filter is set as a PT1 low pass.

#### p1417[0...n]
**Speed setpoint filter 1 denominator natural frequency / n_set_filt 1 fn_d**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Access level</th>
<th>Data type</th>
<th>Dynamic index</th>
<th>Func. diagram</th>
<th>Units group</th>
<th>Unit selection</th>
<th>Expert list</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p1417[0...n]</td>
<td>Can be changed: U, T</td>
<td>Calculated: -</td>
<td>FloatingPoint32</td>
<td>DDS, p0180</td>
<td>5020</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>2000.0 [Hz]</td>
</tr>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.5 [Hz] 16000.0 [Hz]</td>
</tr>
</tbody>
</table>

**Description:**
Sets the denominator natural frequency for speed setpoint filter 1 (PT2, general filter).

**Dependency:**
Refer to: p1414, p1415

**Note:**
This parameter is only effective if the speed filter is parameterized as a PT2 low pass or as general filter.
The filter is only effective if the natural frequency is less than half of the sampling frequency.

#### p1418[0...n]
**Speed setpoint filter 1 denominator damping / n_set_filt 1 D_d**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Access level</th>
<th>Data type</th>
<th>Dynamic index</th>
<th>Func. diagram</th>
<th>Units group</th>
<th>Unit selection</th>
<th>Expert list</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p1418[0...n]</td>
<td>Can be changed: U, T</td>
<td>Calculated: -</td>
<td>FloatingPoint32</td>
<td>DDS, p0180</td>
<td>5020</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>0.700</td>
</tr>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.001 10.000</td>
</tr>
</tbody>
</table>

**Description:**
Sets the denominator damping for speed setpoint filter 1 (PT2, general filter).

**Dependency:**
Refer to: p1414, p1415

**Note:**
This parameter is only effective if the speed filter is parameterized as a PT2 low pass or as general filter.

#### p1419[0...n]
**Speed setpoint filter 1 numerator natural frequency / n_set_filt 1 fn_n**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Access level</th>
<th>Data type</th>
<th>Dynamic index</th>
<th>Func. diagram</th>
<th>Units group</th>
<th>Unit selection</th>
<th>Expert list</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p1419[0...n]</td>
<td>Can be changed: U, T</td>
<td>Calculated: -</td>
<td>FloatingPoint32</td>
<td>DDS, p0180</td>
<td>5020</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>2000.0 [Hz]</td>
</tr>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.5 [Hz] 16000.0 [Hz]</td>
</tr>
</tbody>
</table>

**Description:**
Sets the numerator natural frequency for speed setpoint filter 1 (general filter).

**Dependency:**
Refer to: p1414, p1415

**Note:**
This parameter is only effective if the speed filter is set as a general filter.
The filter is only effective if the natural frequency is less than half of the sampling frequency.


<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>p1420[0...n]</strong></td>
<td><strong>Speed setpoint filter 1 numerator damping / n_set_filt 1 D_n</strong></td>
<td>Sets the numerator damping for speed setpoint filter 1 (general filter).</td>
<td>This parameter is only effective if the speed filter is set as a general filter.</td>
</tr>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Data type: FloatingPoint32</td>
<td>Dynamic index: DDS, p0180</td>
<td>Func. diagram: 5020</td>
</tr>
<tr>
<td></td>
<td>P-Group: Closed-loop control</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td></td>
<td>Not for motor type: REL</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td></td>
<td>Min 0.000</td>
<td>Max 10.000</td>
<td>Factory setting 0.700</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>p1428[0...n]</strong></td>
<td><strong>Speed pre-control balancing dead time / n_prectrBal t_dead</strong></td>
<td>Sets the dead time to symmetrize the speed setpoint for active torque pre-control.</td>
<td>The selected multiplier refers to the speed controller clock cycle (dead time= p1428 * p0115[1]).</td>
</tr>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Data type: FloatingPoint32</td>
<td>Dynamic index: DDS, p0180</td>
<td>Func. diagram: 5030, 5042, 5210</td>
</tr>
<tr>
<td></td>
<td>P-Group: Closed-loop control</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td></td>
<td>Not for motor type: REL</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td></td>
<td>Min 0.0</td>
<td>Max 2.0</td>
<td>Factory setting 0.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>p1429[0...n]</strong></td>
<td><strong>Speed pre-control balancing time constant / n_prectrBal t</strong></td>
<td>Sets the time constant (PT1) for symmetrizing the speed setpoint for active torque pre-control.</td>
<td>In conjunction with p1429, this parameter can emulate the characteristics of how the torque is established (dynamic response of closed current control loop).</td>
</tr>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Data type: FloatingPoint32</td>
<td>Dynamic index: DDS, p0180</td>
<td>Func. diagram: 5030, 5042, 5210, 6031</td>
</tr>
<tr>
<td></td>
<td>P-Group: Closed-loop control</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td></td>
<td>Not for motor type: REL</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td></td>
<td>Min 0.00 [ms]</td>
<td>Max 10000.00 [ms]</td>
<td>Factory setting 0.00 [ms]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>p1430[0...n]</strong></td>
<td><strong>CI: Speed pre-control / n_prectrl</strong></td>
<td>Sets the signal source for speed pre-control channel (speed pre-control or torque pre-control).</td>
<td>The parameter may be protected as a result of p0922 or p2079 and cannot be changed.</td>
</tr>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Data type: Unsigned32 / FloatingPoint32</td>
<td>Dynamic index: CDS, p0170</td>
<td>Func. diagram: 1550, 1590, 5020</td>
</tr>
<tr>
<td></td>
<td>P-Group: Closed-loop control</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td></td>
<td>Not for motor type: REL</td>
<td>Scaling: p2000</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td></td>
<td>Min 0</td>
<td>Max 0</td>
<td>Factory setting 0</td>
</tr>
</tbody>
</table>

Description: The pre-control signal via connector input p1430 only becomes effective at p1402.4 = 1 (torque-speed pre-control with encoder) at p1400.10 = 0 (for setp_filter 2).
### List of parameters

#### r1432
**Description:**
Displays the speed pre-control value after symmetrizing for the torque build-up (emulates the closed current control loop).

**Dependency:**
Symmetrizing can be parameterized with p1428 and/or p1429.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>r1432 CO: Speed pre-control after symmetrizing / n_prectr after sym</td>
<td></td>
</tr>
</tbody>
</table>

#### p1433[0...n]
**Description:**
Sets the natural frequency of a PT2 element for the reference model of the speed controller.

**Recommend:**
The reference model is correctly set when the characteristics of p1439 (reference model output) and p1445 (actual speed value) are virtually identical when the I component of the speed controller is disabled.

**Dependency:**
Together with p1434 and p1435, the characteristics (in the time domain) of the closed-loop speed control (P) can be emulated.

For VECTOR (r0107) the following applies:
The reference model is activated with p1400.3 = 1. For sensorless vector control (p1300 = 20) the reference model is disabled in open-loop speed controlled operation (refer to p1755).

Refer to: p1434, p1435

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>p1433[0...n] Speed controller reference model natural frequency / n_ctrl RefMod fn</td>
<td></td>
</tr>
</tbody>
</table>

#### p1434[0...n]
**Description:**
Sets the damping of a PT2 element for the reference model of the speed controller.

**Recommend:**
The reference model is correctly set when the characteristics of p1439 (reference model output) and p1445 (actual speed value) are virtually identical when the I component of the speed controller is disabled.

**Dependency:**
In conjunction with p1433 and p1435, the characteristics (in time) of the P-controlled speed control loop can be emulated.

For VECTOR (r0107) the following applies:
The reference model is activated with p1400.3 = 1. For sensorless vector control (p1300 = 20) the reference model is disabled in open-loop speed controlled operation (refer to p1755).

Refer to: p1433, p1435

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>p1434[0...n] Speed controller reference model damping / n_ctrl RefMod D</td>
<td></td>
</tr>
</tbody>
</table>

#### p1435[0...n]
**Description:**
Sets the "fractional" dead time for the reference model of the speed controller.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>p1435[0...n] Speed controller reference model dead time / n_ctrRefMod t_dead</td>
<td></td>
</tr>
</tbody>
</table>
This parameter emulates the computing dead time of the proportionally controlled speed control loop.
The selected multiplier refers to the speed controller clock cycle (dead time= p1435 * p0115[1]).

**Recommend:**
The reference model is correctly set when the characteristics of p1439 (reference model output) and p1445 (actual speed value) are virtually identical when the I component of the speed controller is disabled.

**Dependency:**
In conjunction with p1433 and p1434, the characteristics (in time) of the P-controlled speed control loop can be emulated.

For VECTOR (r0107) the following applies:
The reference model is activated with p1400.3 = 1.
Refer to: p1433, p1434

---

**r1436**
CO: Speed controller reference model speed setpoint output / RefMod n_set outp

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Access level</th>
<th>Data type</th>
<th>Units group</th>
<th>Function diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Can be changed: - Calculated: -</td>
<td>3</td>
<td>FloatingPoint32</td>
<td>3_1</td>
<td>-</td>
</tr>
<tr>
<td>P-Group: Closed-loop control</td>
<td>Dynamic index: -</td>
<td>5030, 6031</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type: REL</td>
<td>Units group: 3_1</td>
<td>Unit selection: p0505</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Scaling: p2000</td>
<td>Expert list: 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max</td>
<td>Factory setting</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- [rpm]</td>
<td>- [rpm]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:**
Displays the speed setpoint at the output of the reference model.

**Dependency:**
For VECTOR (r0107) the following applies:
The reference model is activated with p1400.3 = 1.

---

**r1438**
CO: Speed controller, speed setpoint / n_ctrl n_set

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Access level</th>
<th>Data type</th>
<th>Units group</th>
<th>Function diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Can be changed: - Calculated: -</td>
<td>3</td>
<td>FloatingPoint32</td>
<td>3_1</td>
<td>-</td>
</tr>
<tr>
<td>P-Group: Closed-loop control</td>
<td>Dynamic index: -</td>
<td>5030, 5040, 6040, 5300, 5620, 6031, 6040</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type: REL</td>
<td>Units group: 3_1</td>
<td>Unit selection: p0505</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Scaling: p2000</td>
<td>Expert list: 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max</td>
<td>Factory setting</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- [rpm]</td>
<td>- [rpm]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:**
Displays the speed setpoint after setpoint limiting for the P component of the speed controller.

**Dependency:**
For U/f operation, the value that is displayed is of no relevance.

**Note:**
Refer to: r1439

---

**r1439**
Speed setpoint, I component / n_set l_comp

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Access level</th>
<th>Data type</th>
<th>Units group</th>
<th>Function diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Can be changed: - Calculated: -</td>
<td>3</td>
<td>FloatingPoint32</td>
<td>3_1</td>
<td>-</td>
</tr>
<tr>
<td>P-Group: Closed-loop control</td>
<td>Dynamic index: -</td>
<td>5030, 5040, 6031</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type: REL</td>
<td>Units group: 3_1</td>
<td>Unit selection: p0505</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Scaling: p2000</td>
<td>Expert list: 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max</td>
<td>Factory setting</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- [rpm]</td>
<td>- [rpm]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:**
Displays the speed setpoint for the I component of the speed controller (output of the reference model after the setpoint limiting).

**Dependency:**
Refer to: r1438

**Note:**
In the standard state (the reference model is de-activated), r1438 = r1439.
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p1441[0...n]</td>
<td>Sets the smoothing time constant (PT1) for the speed actual value.</td>
<td>Refer to: r0063, p1451</td>
<td>The speed actual value should be smoothed for encoders with a low pulse number or for resolvers. After this parameter has been changed, we recommend that the speed controller is adapted and/or the speed controller settings checked Kp (p1460) and Tn (p1462).</td>
</tr>
<tr>
<td>r1444</td>
<td>Displays the sum of all speed setpoints that are present. The following sources are available for the displayed setpoint: - setpoint at the ramp-function generator input (r1119). - speed setpoint 1 (p1155). - speed setpoint 2 (p1160). - speed setpoint for the speed pre-control (p1430). - setpoint from DSC (for DSC active). - setpoint via PC (for master control active).</td>
<td>Refer to: r1119, p1155, p1160, p1430</td>
<td></td>
</tr>
<tr>
<td>p1451[0...n]</td>
<td>Sets the smoothing time for the calculated speed actual value in sensorless operation.</td>
<td>Refer to: p1441</td>
<td></td>
</tr>
<tr>
<td>r1454</td>
<td>Displays the system deviation of the I component of the speed controller. When the reference model is inactive (p1433 = 0 Hz), this parameter corresponds to the system deviation of the complete PI controller (r1454 = r0064).</td>
<td>Refer to: r1119, p1155, p1160, p1430</td>
<td></td>
</tr>
</tbody>
</table>
**List of parameters**

### p1455[0...n]

**CI: Speed controller P gain adaptation signal / n_ctrl Adpt_sig Kp**

- **Can be changed:** T
- **Data type:** Unsigned32 / FloatingPoint32
- **P-Group:** Closed-loop control
- **Not for motor type:** REL
- **Description:** Sets the source for the adaptation signal to additionally adapt the P gain of the speed controller.

#### Dependency:
Refer to: p1456, p1457, p1458, p1459

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>0</td>
</tr>
</tbody>
</table>

### p1456[0...n]

**Speed controller P gain adaptation lower starting point / n_ctrl AdaptKpLow**

- **Can be changed:** U, T
- **Data type:** FloatingPoint32
- **P-Group:** Closed-loop control
- **Not for motor type:** REL
- **Description:** Sets the lower starting point of the adaptation range for the additional adaptation of the P gain of the speed controller.

The values are in % and refer to the set source of the adaptation signal.

#### Dependency:
Refer to: p1455, p1457, p1458, p1459

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.00 [%]</td>
<td>400.00 [%]</td>
<td>0.00 [%]</td>
</tr>
</tbody>
</table>

### p1457[0...n]

**Speed controller P gain adaptation upper starting point / n_ctrl AdaptKp up**

- **Can be changed:** U, T
- **Data type:** FloatingPoint32
- **P-Group:** Closed-loop control
- **Not for motor type:** REL
- **Description:** Sets the upper starting point of the adaptation range for the additional adaptation of the P gain of the speed controller.

The values are in % and refer to the set source of the adaptation signal.

#### Dependency:
Refer to: p1455, p1456, p1458, p1459

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.00 [%]</td>
<td>400.00 [%]</td>
<td>0.00 [%]</td>
</tr>
</tbody>
</table>

### p1458[0...n]

**Adaptation factor, lower / Adapt_factor lower**

- **Can be changed:** U, T
- **Data type:** FloatingPoint32
- **P-Group:** Closed-loop control
- **Not for motor type:** REL
- **Description:** Sets the adaptation factor before the adaptation range (0 % ... p1456) to additionally adapt the P gain of the speed/velocity controller.

#### Dependency:
Refer to: p1455, p1456, p1457, p1459

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0 [%]</td>
<td>200000.0 [%]</td>
<td>100.0 [%]</td>
</tr>
</tbody>
</table>
### List of parameters

#### p1459[0...n]  Adaptation factor, upper / Adapt_factor upper

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed:</td>
<td>U, T</td>
</tr>
<tr>
<td>Data type:</td>
<td>FloatingPoint32</td>
</tr>
<tr>
<td>P-Group:</td>
<td>Closed-loop control</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>REL</td>
</tr>
<tr>
<td>Min</td>
<td>0.0 [%]</td>
</tr>
<tr>
<td>Max</td>
<td>200000.0 [%]</td>
</tr>
</tbody>
</table>

**Description:** Sets the adaptation factor after the adaptation range (> p1457) to additionally adapt the P gain of the speed/velocity controller.

**Dependency:** Refer to: p1455, p1456, p1457, p1458

#### p1460[0...n]  Speed controller P gain adaptation speed, lower / n_ctrl Kp n lower

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed:</td>
<td>U, T</td>
</tr>
<tr>
<td>Data type:</td>
<td>FloatingPoint32</td>
</tr>
<tr>
<td>P-Group:</td>
<td>Closed-loop control</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>REL</td>
</tr>
<tr>
<td>Min</td>
<td>0.000 [Nms/rad]</td>
</tr>
<tr>
<td>Max</td>
<td>999999.000 [Nms/rad]</td>
</tr>
</tbody>
</table>

**Description:** Sets the P gain of the speed controller before the adaptation speed range (0 ... p1464). This value corresponds to the basic setting of the P gain of the speed controller without adaptation (% referred to p1461 = 100 %).

**Dependency:** Refer to: p1461, p1464, p1465

**Note:** When automatically calculating the speed controller, only the motor moment of inertia is taken into account (p0341). For higher load moments of inertia (p0342 > 1 or p1498 > 0), you are advised to check the speed controller gain.

#### p1461[0...n]  Speed controller Kp adaptation speed, upper scaling / n_ctrl Kp n upper

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed:</td>
<td>U, T</td>
</tr>
<tr>
<td>Data type:</td>
<td>FloatingPoint32</td>
</tr>
<tr>
<td>P-Group:</td>
<td>Closed-loop control</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>REL</td>
</tr>
<tr>
<td>Min</td>
<td>0.0 [%]</td>
</tr>
<tr>
<td>Max</td>
<td>200000.0 [%]</td>
</tr>
</tbody>
</table>

**Description:** Sets the P gain of the speed controller for the upper adaptation speed range (> p1465). The entry is made referred to the P gain for the lower adaptation speed range of the speed controller (% referred to p1461).

**Dependency:** Refer to: p1461, p1464, p1465

**Note:** When automatically calculating the speed controller, only the motor moment of inertia is taken into account (p0341). For higher load moments of inertia (p0342 > 1 or p1498 > 0), you are advised to check the speed controller gain.

#### p1462[0...n]  Speed controller integral time adaptation speed lower / n_ctrl Tn n lower

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed:</td>
<td>U, T</td>
</tr>
<tr>
<td>Data type:</td>
<td>FloatingPoint32</td>
</tr>
<tr>
<td>P-Group:</td>
<td>Closed-loop control</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>REL</td>
</tr>
<tr>
<td>Min</td>
<td>0.00 [ms]</td>
</tr>
<tr>
<td>Max</td>
<td>100000.00 [ms]</td>
</tr>
</tbody>
</table>

**Description:** Sets the adaptation factor after the adaptation range (> p1457) to additionally adapt the P gain of the speed/velocity controller.

**Dependency:** Refer to: p1455, p1456, p1457, p1458

**Note:** When automatically calculating the speed controller, only the motor moment of inertia is taken into account (p0341). For higher load moments of inertia (p0342 > 1 or p1498 > 0), you are advised to check the speed controller gain.
### Parameter List

#### p1463[0...n]
**Speed controller Tn adaptation speed, upper** / n_ctrl Tn n upper
- **SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**
- **Can be changed:** U, T
- **Data type:** FloatingPoint32
- **P-Group:** Closed-loop control
- **Not for motor type:** REL
- **Min:** 0.0 [%]
- **Max:** 200000.0 [%]
- **Factory setting:** 100.0 [%]
- **Access level:** 3
- **Func. diagram:** 5050
- **Units group:** 3_1
- **Unit selection:** p0505
- **Expert list:** 1
- **Calculations:** CALC_MOD_CON
- **Dynamic index:** DDS, p0180
- **Scaling:** -
- **Dynamic index:** DDS, p0180
- **Units group:** 3_1
- **Unit selection:** p0505
- **Expert list:** 1
- **Calculations:** CALC_MOD_CON
- **Dynamic index:** DDS, p0180
- **Units group:** 3_1
- **Unit selection:** p0505
- **Expert list:** 1
- **Calculations:** CALC_MOD_CON
- **Dynamic index:** DDS, p0180
- **Units group:** 3_1
- **Unit selection:** p0505
- **Expert list:** 1

**Description:**
Sets the integral time of the speed controller after the adaptation speed range (> p1465). The entry is made referred to the integral time for the lower adaptation speed range of the speed controller (% referred to p1462).

**Dependency:**
Refer to: p1462, p1464, p1465

#### p1464[0...n]
**Speed controller adaptation speed, lower** / n_ctrl n lower
- **SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**
- **Can be changed:** U, T
- **Data type:** FloatingPoint32
- **P-Group:** Closed-loop control
- **Not for motor type:** REL
- **Min:** 0.00 [rpm]
- **Max:** 210000.00 [rpm]
- **Factory setting:** 0.00 [rpm]
- **Access level:** 3
- **Func. diagram:** 5050
- **Units group:** 3_1
- **Unit selection:** p0505
- **Expert list:** 1
- **Calculations:** CALC_MOD_CON
- **Dynamic index:** DDS, p0180
- **Units group:** 3_1
- **Unit selection:** p0505
- **Expert list:** 1
- **Calculations:** CALC_MOD_CON
- **Dynamic index:** DDS, p0180
- **Units group:** 3_1
- **Unit selection:** p0505
- **Expert list:** 1
- **Calculations:** CALC_MOD_CON
- **Dynamic index:** DDS, p0180
- **Units group:** 3_1
- **Unit selection:** p0505
- **Expert list:** 1

**Description:**
Sets the lower adaptation speed of the speed controller. No adaptation is effective below this speed.

**Dependency:**
Refer to: p1460, p1461, p1462, p1463, p1465

#### p1465[0...n]
**Speed controller adaptation speed, upper** / n_ctrl n upper
- **SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**
- **Can be changed:** U, T
- **Data type:** FloatingPoint32
- **P-Group:** Closed-loop control
- **Not for motor type:** REL
- **Min:** 0.00 [rpm]
- **Max:** 210000.00 [rpm]
- **Factory setting:** 210000.00 [rpm]
- **Access level:** 3
- **Func. diagram:** 5050
- **Units group:** 3_1
- **Unit selection:** p0505
- **Expert list:** 1
- **Calculations:** CALC_MOD_CON
- **Dynamic index:** DDS, p0180
- **Units group:** 3_1
- **Unit selection:** p0505
- **Expert list:** 1
- **Calculations:** CALC_MOD_CON
- **Dynamic index:** DDS, p0180
- **Units group:** 3_1
- **Unit selection:** p0505
- **Expert list:** 1
- **Calculations:** CALC_MOD_CON
- **Dynamic index:** DDS, p0180
- **Units group:** 3_1
- **Unit selection:** p0505
- **Expert list:** 1

**Description:**
Sets the upper adaptation speed of the speed controller. No adaptation is effective above this speed. For P gain, p1460 x p1464 is effective. For the integral time, p1462 x p1463 is effective.

**Dependency:**
Refer to: p1460, p1461, p1462, p1463, p1464

#### p1466[0...n]
**Cl: Speed controller P-gain scaling** / n_ctrl Kp scal
- **SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**
- **Can be changed:** T
- **Data type:** Unsigned32 / Floati8ngPoint32
- **P-Group:** Closed-loop control
- **Not for motor type:** REL
- **Min:** -
- **Max:** 1
- **Factory setting:** 1
- **Access level:** 3
- **Func. diagram:** 5050
- **Units group:** -
- **Unit selection:** -
- **Expert list:** 1
- **Calculations:** -
- **Dynamic index:** CDS, p0170
- **Units group:** -
- **Unit selection:** -
- **Expert list:** 1
- **Calculations:** -
- **Dynamic index:** CDS, p0170
- **Units group:** -
- **Unit selection:** -
- **Expert list:** 1
- **Calculations:** -
- **Dynamic index:** CDS, p0170
- **Units group:** -
- **Unit selection:** -
- **Expert list:** 1

**Description:**
Sets the signal source for the scaling of the P gain of the speed controller. This also makes the effective P gain (including adaptations) scalable.
### List of parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>r1468</td>
<td>Displays the effective P gain of the speed controller.</td>
<td>Note: When automatically calculating the speed controller, only the motor moment of inertia is taken into account (p0341). For higher load moments of inertia (p0342 &gt; 1 or p1498 &gt; 0), you are advised to check the speed controller gain.</td>
</tr>
<tr>
<td>r1469</td>
<td>Displays the effective integral time of the speed controller.</td>
<td></td>
</tr>
<tr>
<td>p1470[0...n]</td>
<td>Displays the P gain for encoderless operation for the speed controller.</td>
<td>Note: For higher load moments of inertia (p0342 &gt; 1 or p1498 &gt; 0), you are advised to check the speed controller gain.</td>
</tr>
<tr>
<td>p1472[0...n]</td>
<td>Displays the integral time for encoderless operation for the speed controller.</td>
<td></td>
</tr>
<tr>
<td>p1476[0...n]</td>
<td>Sets the signal source to hold the integrator for the speed controller.</td>
<td></td>
</tr>
</tbody>
</table>

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SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3  
1-247
### p1477[0...n] BI: Speed controller set integrator value / _n_ctrl integ set

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Can be changed: T Calculated: - Access level: 3</td>
</tr>
<tr>
<td>P-Group: Closed-loop control Units group: - Unit selection: -</td>
<td>Not for motor type: REL Scaling: - Expert list: 1</td>
</tr>
<tr>
<td>Description:</td>
<td>Sets the signal source to set the integrator setting value (p1478).</td>
</tr>
</tbody>
</table>

### p1478[0...n] CI: Speed controller integrator setting value / _n_ctr integ_setVal

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Can be changed: T Calculated: - Access level: 3</td>
</tr>
<tr>
<td>P-Group: Closed-loop control Units group: - Unit selection: -</td>
<td>Not for motor type: REL Scaling: p2003 Expert list: 1</td>
</tr>
<tr>
<td>Description:</td>
<td>Sets the signal source for the integrator setting value for the velocity controller. The signal to set this integrator setting value is interconnected via p1477.</td>
</tr>
</tbody>
</table>

### r1480 CO: Speed controller PI torque output / _n_ctrl PI-M_output

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Can be changed: - Calculated: - Access level: 3</td>
</tr>
<tr>
<td>P-Group: Closed-loop control Units group: 7_1 Unit selection: p0505</td>
<td>Not for motor type: REL Scaling: p2003 Expert list: 1</td>
</tr>
<tr>
<td>Description:</td>
<td>Displays the torque setpoint at the output of the PI speed controller.</td>
</tr>
</tbody>
</table>

### r1481 CO: Speed controller P torque output / _n_ctl P-M_output

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Can be changed: - Calculated: - Access level: 3</td>
</tr>
<tr>
<td>P-Group: Closed-loop control Units group: 7_1 Unit selection: p0505</td>
<td>Not for motor type: REL Scaling: p2003 Expert list: 1</td>
</tr>
<tr>
<td>Description:</td>
<td>Displays the torque setpoint at the output of the P speed controller.</td>
</tr>
</tbody>
</table>
List of parameters

**r1482**
**CO: Speed controller I torque output / n_ctrl I-M_output**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Displays the torque setpoint at the output of the I speed controller.</td>
</tr>
</tbody>
</table>

- **Can be changed:** Calculated: -
- **Data type:** FloatingPoint32
- **P-Group:** Closed-loop control
- **Not for motor type:** REL
- **Min:** - [Nm]
- **Max:** - [Nm]
- **Unit selection:** p0505
- **Expert list:** 1
- **Factory setting:**
- **Dependency:**
  - p1300, p1402, p1404, p1497
- **Note:**
  - The parameterized total moment of inertia, taking into account p1497, influences the torque pre-control. In encoderless operation or when the torque-speed pre-control with encoder (p1402.4 = 1) is activated, then torque-speed pre-control is activated.

**r1493**
**CO: Moment of inertia, total / M_inertia total**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Displays the parameterized total moment of inertia ((p0341 * p0342) + p1498) without evaluation by the scaling via p1497.</td>
</tr>
</tbody>
</table>

- **Can be changed:** Calculated: -
- **Data type:** FloatingPoint32
- **P-Group:** Closed-loop control
- **Not for motor type:** REL
- **Min:** - [kgm²]
- **Max:** - [kgm²]
- **Unit selection:** p0100
- **Expert list:** 1
- **Factory setting:**
- **Dependency:**
  - Refer to: p1300, p1402, p1404, p1497
- **Note:**
  - The parameterized total moment of inertia, taking into account p1497, influences the torque pre-control.

**p1494[0...n]**
**Speed controller integrator feedback time constant / n_ctr integ_fdbk T**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Sets the time constant of the PT1 filter for integrator feedback.</td>
</tr>
</tbody>
</table>

- **Can be changed:** U, T
- **Data type:** FloatingPoint32
- **P-Group:** Closed-loop control
- **Not for motor type:** REL
- **Min:** 0.00 [ms]
- **Max:** 1000.00 [ms]
- **Unit selection:** p0180
- **Expert list:** 1
- **Factory setting:** 0.00 [ms]
- **Dependency:**
- **Note:**
  - The integrator of the speed controller is re-parameterized to become a PT1 filter through a feedback element (1st Order low pass filter characteristics).
  - The following applies:
    - p1494 < 0.25 (2 x p0115[1]) --> the PT1 filter is not active - the pure integrator is effective.
    - p1494 >= 0.25 (2 x p0115[1]) --> the PT1 filter is active and has replaced the pure integrator.
  - Motion at zero setpoint and dominant stiction can be suppressed but this has a negative impact on the remaining setpoint-actual value difference. This can be used, for example, to avoid oscillation of a position-controlled axis at standstill (stick-slip effect) or overshoot when traversing (moving) in micrometer steps. Also prevents tension/stressing for axes that are mechanically and rigidly coupled with one another (e.g. for synchronous spindles, master - slave axes).
### p1497[0...n] CI: Moment of inertia, scaling / M_mom inert scal

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

- **Can be changed:** U, T
- **Data type:** Unsigned32 / FloatingPoint32
- **Dynamic index:** CDS, p0170
- **Func. diagram:** 5042, 5210, 6030, 6031
- **P-Group:** Closed-loop control
- **Units group:** -
- **Scaling:** PERCENT
- **Expert list:** 1
- **Min:** -
- **Max:** 1
- **Factory setting:**

**Description:** Sets the signal source for scaling the moment of inertia.

**Notice:** This parameter has no effect when the "moment of inertia estimator" function is active (r0108.10 = 1, p1400.18 = 1).

### p1498[0...n] Load moment of inertia / Load mom of inert

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

- **Can be changed:** U, T
- **Data type:** FloatingPoint32
- **Dynamic index:** DDS, p0180
- **Func. diagram:** 5042, 5210
- **P-Group:** Closed-loop control
- **Units group:** 25_1
- **Unit selection:** p0100
- **Scaling:** -
- **Expert list:** 1
- **Min:** 0.00000 [kgm²]
- **Max:** 100000.00000 [kgm²]
- **Factory setting:** 0.00000 [kgm²]

**Description:** Sets the load moment of inertia.

**Note:** This parameter is the product of p0341 * p0342 + p1498. It influences the speed/torque pre-control in encoderless operation.

### p1501[0...n] BI: Change over between closed-loop speed/torque control / Changeov n/M_ctrl

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

- **Can be changed:** U, T
- **Data type:** Unsigned32 / Binary
- **Dynamic index:** CDS, p0170
- **Func. diagram:** 1700, 2520, 5060, 6060
- **P-Group:** Closed-loop control
- **Units group:** -
- **Unit selection:** -
- **Scaling:** -
- **Expert list:** 1
- **Min:** -
- **Max:** 0
- **Factory setting:**

**Description:** Sets the signal source for toggling between speed and torque control.

**Dependency:** The input connectors to enter the torque are provided using p1511, p1512 and p1513.

**Refer to:** p1500

**Caution:** If the closed-loop torque control is not activated (p1300) and a change is made to closed-loop torque control (p1501), OFF1 (p0840) does not have its own braking response but pulse suppression when standstill is detected (p1226, p1227).

**Notice:** The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

**Note:**
- 0 signal: Closed-loop speed control
- 1 signal: Closed-loop torque control

### p1502[0...n] BI: Freeze moment of inertia estimator / J_estim freeze

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

- **Can be changed:** U, T
- **Data type:** Unsigned32 / Binary
- **Dynamic index:** CDS, p0170
- **Func. diagram:** -
- **P-Group:** Closed-loop control
- **Units group:** -
- **Unit selection:** -
- **Scaling:** -
- **Expert list:** 1
- **Min:** -
- **Max:** 0
- **Factory setting:**

**Description:** Sets the signal source to freeze the estimated moment of inertia.

**0 signal:**
- Moment of inertia estimator active
- 1 signal: Determined moment of inertia frozen.

**Dependency:** Refer to: p1300
Note: Only active when the "moment of inertia estimator" function module is active (r0108.10 = 1) and p1400.18 = 1.
For operation with encoder, in addition, p1402.4 must be set to 1.

### r1509 CO: Torque setpoint before torque limiting / M_set before M_lim

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

<table>
<thead>
<tr>
<th>Description</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
<th>Func. diagram:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Displays the total torque setpoint before the torque limiting (total of the controller output, supplementary torque and if required, the pre-control torque, encoderless operation).</td>
<td>-</td>
<td></td>
<td>3</td>
<td>1590, 5060, 5610</td>
</tr>
</tbody>
</table>

**P-Group: Closed-loop control**

**Not for motor type: REL**

**Min**

- [Nm]

**Max**

- [Nm]

**Unit selection:** p0505

**Expert list:** 1

**Unit group:** 7_1

**Factory setting:**

### p1511[0...n] Cl: Supplementary torque 1 / M_suppl 1

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

<table>
<thead>
<tr>
<th>Description</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
<th>Func. diagram:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sets the signal source for supplementary torque 1.</td>
<td>T</td>
<td></td>
<td>3</td>
<td>5060, 6060</td>
</tr>
</tbody>
</table>

**P-Group: Closed-loop control**

**Not for motor type: REL**

**Min**

- 

**Max**

- 

**Unit selection:** p0170

**Expert list:** 1

**Unit group:**

### p1512[0...n] Cl: Supplementary torque 1 scaling / M_suppl 1 scal

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

<table>
<thead>
<tr>
<th>Description</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
<th>Func. diagram:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sets the signal source for scaling the supplementary torque 1.</td>
<td>T</td>
<td></td>
<td>3</td>
<td>5060, 6060</td>
</tr>
</tbody>
</table>

**P-Group: Closed-loop control**

**Not for motor type: REL**

**Min**

- 

**Max**

- 

**Unit selection:** p2003

**Expert list:** 1

**Unit group:** PERCENT

### p1513[0...n] Cl: Supplementary torque 2 / M_suppl 2

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

<table>
<thead>
<tr>
<th>Description</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
<th>Func. diagram:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sets the signal source for supplementary torque 2.</td>
<td>T</td>
<td></td>
<td>3</td>
<td>5060, 6060</td>
</tr>
</tbody>
</table>

**P-Group: Closed-loop control**

**Not for motor type: REL**

**Min**

- 

**Max**

- 

**Unit selection:** p2003

**Expert list:** 1

**Unit group:**

### r1515 Supplementary torque total / M_suppl total

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

<table>
<thead>
<tr>
<th>Description</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
<th>Func. diagram:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Displays the total supplementary torque.</td>
<td>-</td>
<td></td>
<td>2</td>
<td>5040, 5060</td>
</tr>
</tbody>
</table>

**P-Group: Closed-loop control**

**Not for motor type: REL**

**Min**

- [Nm]

**Max**

- [Nm]

**Unit group:** 7_1

**Expert list:** p0505

**Unit selection:**

**Expert list:** 1

**Unit group:** -

**Factory setting:**

The displayed value is the total of supplementary torque values 1 and 2 (p1511, p1512, p1513, p1514).
### List of parameters

#### p1517[0...n]
**Accelerating torque smoothing time constant / M_accel T_smooth**

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

<table>
<thead>
<tr>
<th>Data type: FloatingPoint32</th>
<th>Dynamic index: DDS, p0180</th>
<th>Func. diagram: 5042, 5210, 6060</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-Group: Closed-loop control</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type: REL</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
</tr>
<tr>
<td>0.00 [ms]</td>
<td>100.00 [ms]</td>
<td>4.00 [ms]</td>
</tr>
</tbody>
</table>

**Description:**
Sets the smoothing time constant of the accelerating torque.

**Note:**
For servo drives, the parameter is only effective in encoderless operation.
For vector drives, the acceleration pre-control is inhibited if the smoothing is set to the maximum value.

#### r1518[0...1]
**CO: Accelerating torque / M_accel**

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

<table>
<thead>
<tr>
<th>Data type: FloatingPoint32</th>
<th>Dynamic index: DDS, p0180</th>
<th>Func. diagram: 5042, 5210</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-Group: Closed-loop control</td>
<td>Units group: 7_1</td>
<td>Unit selection: p0505</td>
</tr>
<tr>
<td>Not for motor type: REL</td>
<td>Scaling: p2003</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
</tr>
<tr>
<td>- [Nm]</td>
<td>- [Nm]</td>
<td>- [Nm]</td>
</tr>
</tbody>
</table>

**Description:**
Displays the accelerating torque to pre-control the speed controller for torque-speed pre-control (p1402.4 = 1) or in encoderless operation.

**Index:**

- [0] = Unsmoothed
- [1] = Smoothed

**Dependency:**
Refer to: p0341, p0342, p1300, p1402, r1493, p1497, p1498

#### p1520[0...n]
**CO: Torque limit upper/motoring / M_max upper/mot**

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

<table>
<thead>
<tr>
<th>Data type: FloatingPoint32</th>
<th>Dynamic index: DDS, p0180</th>
<th>Func. diagram: 5620, 5630</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-Group: Closed-loop control</td>
<td>Units group: 7_1</td>
<td>Unit selection: p0505</td>
</tr>
<tr>
<td>Not for motor type: REL</td>
<td>Scaling: p2003</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
</tr>
<tr>
<td>-1000000.00 [Nm]</td>
<td>20000000.00 [Nm]</td>
<td>0.00 [Nm]</td>
</tr>
</tbody>
</table>

**Dependency:**
Sets the fixed upper torque limit or the torque limit when motoring.

**Danger:**
For p1400.4 = 1 (torque limiting, upper/lower) the following applies:
- Negative values when setting the upper torque limit (p1520 < 0) can result in the motor accelerating in an uncontrollable fashion.

**Notice:**
A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.

#### p1521[0...n]
**CO: Torque limit lower/regenerative / M_max lower/regen**

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

<table>
<thead>
<tr>
<th>Data type: FloatingPoint32</th>
<th>Dynamic index: DDS, p0180</th>
<th>Func. diagram: 5620, 5630</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-Group: Closed-loop control</td>
<td>Units group: 7_1</td>
<td>Unit selection: p0505</td>
</tr>
<tr>
<td>Not for motor type: REL</td>
<td>Scaling: p2003</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
</tr>
<tr>
<td>-20000000.00 [Nm]</td>
<td>10000000.00 [Nm]</td>
<td>0.00 [Nm]</td>
</tr>
</tbody>
</table>

**Description:**
Sets the fixed lower torque limit or the torque limit when regenerating.
### Parameter List of parameters

#### Dependency:
- p1400.4 = 0: upper/lower
- p1400.4 = 1: motoring / regenerating
- Refer to: p0500, p1520, p1522, p1523, p1532

#### Danger:
For p1400.4 = 0 (torque limiting, upper/lower) the following applies:

- Positive values when setting the lower torque limit (p1521 > 0) can result in the motor accelerating in an uncontrolled fashion.

#### Notice:
A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Can be changed</th>
<th>Calculated</th>
<th>Data type</th>
<th>Dynamic index</th>
<th>Access level</th>
<th>Func. diagram</th>
<th>Unit selection</th>
<th>Expert list</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p1522[0...n] CI: Torque limit upper/motoring / M_max upper/mot</td>
<td>Sets the signal source for the upper or torque/force limit when motoring.</td>
<td>T</td>
<td>-</td>
<td>Unsigned32 / FloatingPoint32</td>
<td>CDS, p0170</td>
<td>3</td>
<td>1610, 5620, 5630</td>
<td>-</td>
<td>-</td>
<td>1520[0]</td>
</tr>
<tr>
<td>p1523[0...n] CI: Torque limit lower/regenerative / M_max lower/regen</td>
<td>Sets the signal source for the lower or torque/force limit when regenerating.</td>
<td>T</td>
<td>-</td>
<td>Unsigned32 / FloatingPoint32</td>
<td>CDS, p0170</td>
<td>3</td>
<td>1610, 5620, 5630</td>
<td>-</td>
<td>-</td>
<td>1521[0]</td>
</tr>
<tr>
<td>p1524[0...n] CO: Torque limit upper/motoring scaling / M_max up/mot scal</td>
<td>Sets the scaling for the upper torque limit or the torque limit when motoring.</td>
<td>U, T</td>
<td>-</td>
<td>FloatingPoint32</td>
<td>DDS, p0180</td>
<td>3</td>
<td>5620, 5630</td>
<td>-</td>
<td>-</td>
<td>100.0 [%]</td>
</tr>
</tbody>
</table>
Note: This parameter can be freely interconnected. The value has the meaning stated above if it is interconnected from connector input p1528.

### p1525[0...n]

**CO: Torque limit lower/regenerative scaling / M_max low/gen scal**

- **Can be changed:** U, T
- **Data type:** FloatingPoint32
- **P-Group:** Closed-loop control
- **Not for motor type:** REL
- **Min:** -2000.0 [%]
- **Max:** 2000.0 [%]
- **Access level:** 3

**Description:** Sets the scaling for the lower torque limit or the torque limit when regenerating.

**Dependency:**
- p1400.4 = 0: upper/lower
- p1400.4 = 1: motoring / regenerating

**Notice:** A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.

**Note:** This parameter can be freely interconnected. The value has the meaning stated above if it is interconnected from connector input p1528.

### r1526

**CO: Torque limit upper/motoring without offset / M_max up/w/o offs**

- **Can be changed:** -
- **Data type:** FloatingPoint32
- **P-Group:** Closed-loop control
- **Not for motor type:** REL
- **Min:** - [Nm]
- **Max:** - [Nm]
- **Access level:** 3

**Description:** Displays the upper torque limit of all torque limits without offset.

**Dependency:**
- p1400.4 = 0: upper/lower
- p1400.4 = 1: motoring / regenerating

**Refer to:** p1520, p1521, p1522, p1523, p1528, p1529

### r1527

**CO: Torque limit lower/regenerative without offset / M_max low/w/o offs**

- **Can be changed:** -
- **Data type:** FloatingPoint32
- **P-Group:** Closed-loop control
- **Not for motor type:** REL
- **Min:** - [Nm]
- **Max:** - [Nm]
- **Access level:** 3

**Description:** Displays the lower torque limit of all torque limits without offset.

**Dependency:**
- p1400.4 = 0: upper/lower
- p1400.4 = 1: motoring / regenerating

**Refer to:** p1520, p1521, p1522, p1523, p1528, p1529

### p1528[0...n]

**CI: Torque limit upper/motoring scaling / M_max up/mot scal**

- **Can be changed:** T
- **Data type:** Unsigned32 / FloatingPoint32
- **P-Group:** Closed-loop control
- **Not for motor type:** REL
- **Min:** -
- **Max:** -
- **Access level:** 3

**Description:** Sets the signal source for the scaling of the upper or motoring torque limit in p1522.

**Dependency:**
- p1400.4 = 0: upper/lower
- p1400.4 = 1: motoring / regenerating
List of parameters

**Parameter**

**p1529[0...n]**  
**CI: Torque limit lower/regenerative scaling / M_max low/gen scal**

<table>
<thead>
<tr>
<th>Can be changed:</th>
<th>T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type:</td>
<td>Unsigned32 / FloatingPoint32</td>
</tr>
<tr>
<td>P-Group:</td>
<td>Closed-loop control</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>REL</td>
</tr>
<tr>
<td>Min</td>
<td>-</td>
</tr>
<tr>
<td>Max</td>
<td>-</td>
</tr>
</tbody>
</table>

**Description:**
Sets the signal source for the scaling of the lower torque limit or the regenerative torque limit in p1523.

**Dependency:**
p1400.4 = 0: upper/lower
p1400.4 = 1: motoring / regenerating

**Danger:**
For p1400.4 = 0 (torque limiting, upper/lower) the following applies:
Negative values resulting from the signal source and scaling can cause the motor to accelerate in an uncontrolled manner.

**Notice:**
The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

**p1530[0...n]**  
**Power limit motoring / P_max mot**

<table>
<thead>
<tr>
<th>Can be changed:</th>
<th>U, T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type:</td>
<td>FloatingPoint32</td>
</tr>
<tr>
<td>P-Group:</td>
<td>Closed-loop control</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>REL</td>
</tr>
<tr>
<td>Min</td>
<td>0.00 [kW]</td>
</tr>
<tr>
<td>Max</td>
<td>100000.00 [kW]</td>
</tr>
</tbody>
</table>

**Description:**
Sets the power limit when motoring.

**Dependency:**
Refer to: p0500, p1531

**p1531[0...n]**  
**Power limit regenerative / P_max gen**

<table>
<thead>
<tr>
<th>Can be changed:</th>
<th>U, T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type:</td>
<td>FloatingPoint32</td>
</tr>
<tr>
<td>P-Group:</td>
<td>Closed-loop control</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>REL</td>
</tr>
<tr>
<td>Min</td>
<td>-100000.00 [kW]</td>
</tr>
<tr>
<td>Max</td>
<td>-0.01 [kW]</td>
</tr>
</tbody>
</table>

**Description:**
Sets the regenerative power limit.

**Dependency:**
Refer to: p0500, p1530

**p1532[0...n]**  
**CO: Torque limit offset / M_max offset**

<table>
<thead>
<tr>
<th>Can be changed:</th>
<th>U, T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type:</td>
<td>FloatingPoint32</td>
</tr>
<tr>
<td>P-Group:</td>
<td>Closed-loop control</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>REL</td>
</tr>
<tr>
<td>Min</td>
<td>-100000.00 [Nm]</td>
</tr>
<tr>
<td>Max</td>
<td>100000.00 [Nm]</td>
</tr>
</tbody>
</table>

**Description:**
Sets the torque offset for the torque limit.

**Dependency:**
Refer to: p1520, p1521, p1522, p1523, p1528, p1529

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SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3
**Description:** Displays the maximum torque/force generating current as a result if all current limits.

**Dependency:** Refer to: p1520, p1521, p1522, p1523, p1528, p1529, p1532

**Note:** The effective upper torque limit is reduced with respect to the selected upper torque limit p1520, if the current limit p0640 is reduced or the rated magnetizing current of the induction motor p0320 is increased.

The torque limit p1520 can be re-calculated using p0340 = 1, 3 or 5.
### List of parameters

#### r1539

**CO: Lower effective torque limit / M_max lower eff**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Not for motor type</th>
<th>Units group</th>
<th>Expert list</th>
<th>Access level</th>
<th>Data type</th>
<th>Dynamic index</th>
<th>Units group</th>
<th>Expert list</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Displays the currently effective lower torque limit.</td>
<td>REL</td>
<td>7_1</td>
<td>1</td>
<td>2</td>
<td>FloatingPoint32</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td><strong>Note:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>The effective lower torque limit is reduced with respect to the selected lower torque limit p1521, if the current limit p0640 is reduced or the rated magnetizing current of the induction motor p0320 is increased.</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The torque limit p1520 can be re-calculated using p0340 = 1, 3 or 5.</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

#### p1542[0...n]

**CI: Travel to fixed stop torque reduction / TfS M_red**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Not for motor type</th>
<th>Units group</th>
<th>Expert list</th>
<th>Access level</th>
<th>Data type</th>
<th>Dynamic index</th>
<th>Units group</th>
<th>Expert list</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Sets the signal source for the torque/force reduction when traversing to a fixed stop. This value is converted into a factor and is interconnected to the scaling of the torque/force limits.</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>3</td>
<td>Unsigned32 / FloatingPoint32</td>
<td>CDS, p0170</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td><strong>Notice:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The parameter may be protected as a result of p0922 or p2079 and cannot be changed.</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### r1543

**CO: Travel to fixed stop torque scaling / TfS M_scal**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Not for motor type</th>
<th>Units group</th>
<th>Expert list</th>
<th>Access level</th>
<th>Data type</th>
<th>Dynamic index</th>
<th>Units group</th>
<th>Expert list</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Displays the internally converted factor to interconnect to the scaling of the torque/force limits.</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>3</td>
<td>FloatingPoint32</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td><strong>Dependency:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Refer to: p1528, p1529, r1543, p1544, p1545</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### p1544

**Travel to fixed stop evaluation torque reduction / TfS M_red eval**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Not for motor type</th>
<th>Units group</th>
<th>Expert list</th>
<th>Access level</th>
<th>Data type</th>
<th>Dynamic index</th>
<th>Units group</th>
<th>Expert list</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Sets the evaluation for the torque/force reduction when traversing to a fixed stop.</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>3</td>
<td>FloatingPoint32</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td><strong>Dependency:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Refer to: p1528, p1529, p1542, r1543, p1545</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Note:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4000 hex (16384 dec) in the MOMRED control word corresponds to a reduction by the percentage specified in this parameter.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Parameter List of parameters**

### p1545[0...n]
**BI**: Activates travel to a fixed stop / Tfs activation

Can be changed: T  
Calculated: -  
Access level: 3  
Data type: Unsigned32 / Binary  
Dynamic index: CDS, p0170  
Func. diagram: 2520, 3617, 8012  
P-Group: Commands  
Not for motor type: REL  
Min Max  
- -  
Description: Sets the signal source to activate/de-activate the "travel to fixed stop" function  
1: Travel to fixed stop is active  
0: Travel to fixed stop is inactive  
Dependency: Refer to: p1542, r1543, p1544  
Notice: The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

### p1546
**Speed threshold motoring/regenerating / n_thres mot/regen**

Can be changed: U, T  
Calculated: -  
Access level: 2  
Data type: FloatingPoint32  
Dynamic index: -  
Func. diagram: -  
P-Group: Closed-loop control  
Not for motor type: -  
Scaling: -  
Expert list: 1  
Min Max  
0.00 [rpm] 210000.00 [rpm] 20.00 [rpm]  
Factory setting  
Description: Sets the speed threshold for the motoring/regenerative limit.  
For speeds where the absolute value is less than p1546, then the following applies:  
- For p1400.13 = 0: Motoring limit (speed threshold is compared to the speed actual value).  
- For p1400.13 = 1: Regenerative limiting (speed threshold is compared to the speed setpoint).

### r1549
**CO**: Stall power actual value / P_stall

Can be changed: -  
Calculated: -  
Access level: 3  
Data type: FloatingPoint32  
Dynamic index: -  
Func. diagram: 5640  
P-Group: Displays, signals  
Not for motor type: -  
Scaling: r2004  
Expert list: 1  
Min Max  
- [kW] - [kW] - [kW]  
Factory setting  
Description: Displays the instantaneous stall power.  
Dependency: Refer to: p0326  
Note: The stall power is influenced by p0326, p0353, p0354 and p0356.

### p1550[0...n]
**BI**: Transfer actual torque as torque offset / Accept act torque

Can be changed: T  
Calculated: -  
Access level: 2  
Data type: Unsigned32 / Binary  
Dynamic index: CDS, p0170  
Func. diagram: -  
P-Group: Closed-loop control  
Not for motor type: -  
Scaling: -  
Expert list: 1  
Min Max  
- 9718.23  
Factory setting  
Description: For a positive edge, the actual torque (r0079[0]) at this instant in time is used instead of the torque offset from p1532 as long as p1550 remains at 1.
**List of parameters**

### p1551[0...n]

**BI: Torque limit variable/fixed signal source / M_lim var/fix S_src**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed</td>
<td>U, T</td>
<td>Calculated: -</td>
</tr>
<tr>
<td>Data type</td>
<td>Unsigned32 / Binary</td>
<td>Dynamic index: CDS, p0170</td>
</tr>
<tr>
<td>P-Group</td>
<td>Closed-loop control</td>
<td>Units group: -</td>
</tr>
<tr>
<td>Not for motor type</td>
<td>REL</td>
<td>Scaling: -</td>
</tr>
<tr>
<td>Min</td>
<td>-</td>
<td>Max</td>
</tr>
</tbody>
</table>

**Description:**
Sets the signal source to change over the torque limits between variable and fixed torque limit.

1 signal from BI: p1551:
The variable torque limit applies (fixed torque limit + scaling).
0 signal from BI: p1551:
The fixed torque limit applies.

**Example:**
In order that for a Quick Stop (OFF3) the fixed torque limit is effective, BI: p1551 must be interconnected to r0899.5.

### p1552[0...n]

**CI: Torque limit upper scaling without offset / M_max up w/o offs**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed</td>
<td>T</td>
<td>Calculated: -</td>
</tr>
<tr>
<td>Data type</td>
<td>Unsigned32 / FloatingPoint32</td>
<td>Dynamic index: CDS, p0170</td>
</tr>
<tr>
<td>P-Group</td>
<td>Closed-loop control</td>
<td>Units group: -</td>
</tr>
<tr>
<td>Not for motor type</td>
<td>REL</td>
<td>Scaling: PERCENT</td>
</tr>
<tr>
<td>Min</td>
<td>-</td>
<td>Max</td>
</tr>
</tbody>
</table>

**Description:**
Sets the signal source for the scaling of the upper torque limiting to limit the speed controller output without taking into account the current and power limits.

**Notice:**
Speed controller limiting is only active if a BICO interconnection is set for connector input p1552 or p1554, (different than the factory setting).

### p1554[0...n]

**CI: Torque limit lower scaling without offset / M_max low w/o offs**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed</td>
<td>T</td>
<td>Calculated: -</td>
</tr>
<tr>
<td>Data type</td>
<td>Unsigned32 / FloatingPoint32</td>
<td>Dynamic index: CDS, p0170</td>
</tr>
<tr>
<td>P-Group</td>
<td>Closed-loop control</td>
<td>Units group: -</td>
</tr>
<tr>
<td>Not for motor type</td>
<td>REL</td>
<td>Scaling: PERCENT</td>
</tr>
<tr>
<td>Min</td>
<td>-</td>
<td>Max</td>
</tr>
</tbody>
</table>

**Description:**
Sets the signal source for the scaling of the lower torque limiting to limit the speed controller output without taking into account the current and power limits.

**Notice:**
Speed controller limiting is only active if a BICO interconnection is set for connector input p1552 or p1554, (different than the factory setting).

### p1569[0...n]

**CI: Supplementary torque 3 / M_suppl 3**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed</td>
<td>T</td>
<td>Calculated: -</td>
</tr>
<tr>
<td>Data type</td>
<td>Unsigned32 / FloatingPoint32</td>
<td>Dynamic index: CDS, p0170</td>
</tr>
<tr>
<td>P-Group</td>
<td>Functions</td>
<td>Units group: -</td>
</tr>
<tr>
<td>Not for motor type</td>
<td>REL</td>
<td>Scaling: p2003</td>
</tr>
<tr>
<td>Min</td>
<td>-</td>
<td>Max</td>
</tr>
</tbody>
</table>

**Description:**
Sets the signal source for supplementary torque 3.

**Notice:**
The signal input is after the torque limit (r1538, r1539). For vector drives, the signals that are entered are only limited by the current and power limits.

**Note:**
The signal input is preferably used to enter the friction characteristic. The friction compensation is also effective if the speed controller output reaches its torque limits, but the current limits have still not been reached (this only applies to vector drives).
### p1578[0...n] Flux reduction flux decrease smoothing time / Flux red dec t_sm

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Can be changed:</strong> U, T</td>
</tr>
<tr>
<td><strong>Data type:</strong> FloatingPoint32</td>
</tr>
<tr>
<td><strong>P-Group:</strong> Closed-loop control</td>
</tr>
<tr>
<td><strong>Not for motor type:</strong> PEM, REL, FEM</td>
</tr>
<tr>
<td><strong>Min</strong></td>
</tr>
<tr>
<td>20 [ms]</td>
</tr>
<tr>
<td><strong>Max</strong></td>
</tr>
<tr>
<td>5000 [ms]</td>
</tr>
<tr>
<td><strong>Factory setting</strong></td>
</tr>
<tr>
<td>200 [ms]</td>
</tr>
</tbody>
</table>

**Description:**
Sets the smoothing time for the flux setpoint when decreasing the flux due to flux reduction (p1581 < 100 %).

**Dependency:**
Refer to: p1579, p1581

**Note:**
An excessively long smoothing time extends the time until the maximum torque is reached from the no-load phase.

### p1579[0...n] Flux reduction flux build-up smoothing time / Flux red up t_sm

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Can be changed:</strong> U, T</td>
</tr>
<tr>
<td><strong>Data type:</strong> FloatingPoint32</td>
</tr>
<tr>
<td><strong>P-Group:</strong> Closed-loop control</td>
</tr>
<tr>
<td><strong>Not for motor type:</strong> PEM, REL, FEM</td>
</tr>
<tr>
<td><strong>Min</strong></td>
</tr>
<tr>
<td>0 [ms]</td>
</tr>
<tr>
<td><strong>Max</strong></td>
</tr>
<tr>
<td>5000 [ms]</td>
</tr>
<tr>
<td><strong>Factory setting</strong></td>
</tr>
<tr>
<td>4 [ms]</td>
</tr>
</tbody>
</table>

**Description:**
Sets the smoothing time for the flux setpoint for the flux build-up due to flux reduction (p1581 < 100 %).

**Dependency:**
Refer to: p1578, p1581

**Note:**
An excessively long smoothing time extends the time until the maximum torque is reached from the no-load phase.

### p1581[0...n] Flux reduction factor / Flux red factor

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Can be changed:</strong> U, T</td>
</tr>
<tr>
<td><strong>Data type:</strong> FloatingPoint32</td>
</tr>
<tr>
<td><strong>P-Group:</strong> Closed-loop control</td>
</tr>
<tr>
<td><strong>Not for motor type:</strong> PEM, REL, FEM</td>
</tr>
<tr>
<td><strong>Min</strong></td>
</tr>
<tr>
<td>20 [%]</td>
</tr>
<tr>
<td><strong>Max</strong></td>
</tr>
<tr>
<td>100 [%]</td>
</tr>
</tbody>
</table>

**Description:**
Sets the factor to which the flux is reduced under no-load conditions.

**For a value of 100%, the flux reduction is switched out.**

This parameter refers to the flux saved in the field weakening characteristic.

By reducing the flux, the losses in induction motors can be reduced under no-load conditions or at low torques. However, the time it takes to reach the maximum torque is extended.

**Recommend.:**
For induction motors with closed rotor slots, we recommend that the integral time of the current controller (p1717) is e.g. increased to three times the value.

For stable operation, the maximum field-weakening factor in operation with an encoder must be less than 16 and in operation without an encoder must be less than 4. Lower field weakening factors are recommended. The field weakening factor is calculated as follows:

\[
\frac{(p1082 \times 100 \% \times 600 V)}{(p0348 \times p1581 \times p0070)}
\]

In order to reduce losses due to magnetizing and de-magnetizing, we recommend that the smoothing times are adapted for flux decrease (p1578) and flux build-up (p1579).

In order to reduce the losses as a result of building-up and reducing the torque, we recommend that the torque set-point is smoothed (current setpoint filter (p1656 ...) or speed actual value filter (p1441)).

**Dependency:**
Refer to: p1578, p1579

**Note:**
It only makes sense to activate this function if there are low dynamic requirements placed on the speed controller and there are frequent phases with a low load.

In order to avoid oscillations, if required, the speed controller parameters should be adapted (decrease Kp (p1460, p1470), increase Tn (p1462, p1472)).

When used without an encoder, flux reduction is not possible for induction motors with closed rotor slots.
### List of parameters

#### p1585[0...n] Flux actual value, smoothing time / Flux actVal T_smth

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sets the smoothing time for the flux actual value.</td>
<td></td>
<td>0 [ms] 1000 [ms] 0 [ms]</td>
</tr>
</tbody>
</table>

#### p1590[0...n] Flux controller P gain / Flux controller Kp

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sets the proportional gain for the flux controller.</td>
<td></td>
<td>0.0 [A/Vs] 999999.0 [A/Vs] 10.0 [A/Vs]</td>
</tr>
</tbody>
</table>

#### p1592[0...n] Flux controller integral time / Flux controller Tn

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sets the integral time for the flux controller.</td>
<td></td>
<td>0 [ms] 10000 [ms] 30 [ms]</td>
</tr>
</tbody>
</table>

#### p1612[0...n] Current setpoint, open-loop control, encoderless / I_setCtrEncoderl

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sets the current setpoint for controlled (open-loop) encoderless operation.</td>
<td></td>
<td>0.00 [Arms] 10000.00 [Arms] 0.00 [Arms]</td>
</tr>
</tbody>
</table>

Note:
The value is effective at speeds less than p1755 and represents a reserve for a possibly existing load torque or torque error in the moment of inertia.
### Parameter List

#### r1650
**Current setpoint torque-generating before filter / Iq_set before filt**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Can be changed: -</td>
<td>Displays the torque generating current setpoint Iqset after the torque limits and the clock cycle interpolation is ahead of the current setpoint filters.</td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td>Calculated: -</td>
<td></td>
</tr>
<tr>
<td>P-Group: Closed-loop control</td>
<td>Dynamic index: -</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: REL</td>
<td>Units group: 6_2</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Scaling: p2002</td>
<td></td>
</tr>
<tr>
<td>Max</td>
<td>Expert list: 1</td>
<td></td>
</tr>
</tbody>
</table>

**Dependency:**
The individual current setpoint filters are parameterized as of p1657.

**Note:**
If not all of the filters are required, then the filters should be used consecutively starting from filter 1.

#### r1651
**CO: Torque setpoint, function generator / M_set FG**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Can be changed: -</td>
<td>Displays the torque setpoint of the function generator.</td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td>Calculated: -</td>
<td></td>
</tr>
<tr>
<td>P-Group: Closed-loop control</td>
<td>Dynamic index: -</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: REL</td>
<td>Units group: 7_1</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Scaling: p2003</td>
<td></td>
</tr>
<tr>
<td>Max</td>
<td>Expert list: 1</td>
<td></td>
</tr>
<tr>
<td>- [Nm]</td>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td>- [Nm]</td>
<td>- [Nm]</td>
<td></td>
</tr>
</tbody>
</table>

#### p1656[0...n]
**Activates current setpoint filter / I_setp_filt act**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Can be changed: U, T</td>
<td>Setting for activating/de-activating the current setpoint filter.</td>
</tr>
<tr>
<td>Data type: Unsigned16</td>
<td>Calculated: CALC_MOD_CON</td>
<td></td>
</tr>
<tr>
<td>P-Group: Closed-loop control</td>
<td>Dynamic index: DDS, p0180</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Units group: -</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Scaling: -</td>
<td></td>
</tr>
<tr>
<td>Max</td>
<td>Expert list: 1</td>
<td></td>
</tr>
<tr>
<td>-</td>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td>-</td>
<td>0001 bin</td>
<td></td>
</tr>
</tbody>
</table>

**Dependency:**
The individual current setpoint filters are parameterized as of p1657.

**Note:**
If not all of the filters are required, then the filters should be used consecutively starting from filter 1.

#### p1657[0...n]
**Current setpoint filter 1 type / I_set_filt 1 Typ**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Can be changed: U, T</td>
<td>Sets the current setpoint filter 1 as low pass (PT2) or as extended general 2nd-order filter.</td>
</tr>
<tr>
<td>Data type: Integer16</td>
<td>Calculated: CALC_MOD_CON</td>
<td></td>
</tr>
<tr>
<td>P-Group: Closed-loop control</td>
<td>Dynamic index: DDS, p0180</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: REL</td>
<td>Units group: -</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Scaling: -</td>
<td></td>
</tr>
<tr>
<td>Max</td>
<td>Expert list: 1</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**Dependency:**
Current setpoint filter 1 is activated via p1656.0 and parameterized via p1657 ... p1661.

**Note:**
For an extended general 2nd-order filter, by inserting the same natural frequency in both the numerator and in the denominator, i.e. bandstop frequency, a bandstop filter is implemented. If the numerator damping of zero is selected, the bandstop frequency is completely suppressed.

The denominator damping can be determined from the equation for the 3 dB bandwidth:

\[
f_{3\text{dB bandwidth}} = 2 \times \frac{D_{\text{denominator}}}{f_{\text{bandstop frequency}}}
\]
### p1658[0...n]
**Current setpoint filter 1 denominator natural frequency / \( I_{\text{set filt 1 fn n}} \)**

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sets the denominator natural frequency for current setpoint filter 1 (PT2, general filter).</td>
</tr>
<tr>
<td>Dependency</td>
</tr>
<tr>
<td>Current setpoint filter 1 is activated via p1656.0 and parameterized via p1657 ... p1661.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min</td>
<td>0.5 [Hz]</td>
<td>1999.0 [Hz]</td>
</tr>
<tr>
<td>Max</td>
<td>16000.0 [Hz]</td>
<td>0.700</td>
</tr>
</tbody>
</table>

**Access level:** 3  
**Calculated:** CALC_MOD_CON  
**Func. diagram:** 5710, 6710  
**Units group:** -  
**Unit selection:** -  
**Expert list:** 1  
**Dynamic index:** DDS, p0180  
**Data type:** FloatingPoint32  
**P-Group:** Closed-loop control  
**Not for motor type:** REL  
**Can be changed:** U, T  
**Not for motor type:** REL  
**Scaling:** -  

#### p1659[0...n]
**Current setpoint filter 1 denominator damping / \( I_{\text{set filt 1 D_n}} \)**

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sets the denominator damping for current setpoint filter 1.</td>
</tr>
<tr>
<td>Dependency</td>
</tr>
<tr>
<td>Current setpoint filter 1 is activated via p1656.0 and parameterized via p1657 ... p1661.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min</td>
<td>0.001</td>
<td>10.000</td>
</tr>
<tr>
<td>Max</td>
<td>10.000</td>
<td>0.700</td>
</tr>
</tbody>
</table>

**Access level:** 3  
**Calculated:** CALC_MOD_CON  
**Func. diagram:** 5710, 6710  
**Units group:** -  
**Unit selection:** -  
**Expert list:** 1  
**Dynamic index:** DDS, p0180  
**Data type:** FloatingPoint32  
**P-Group:** Closed-loop control  
**Not for motor type:** REL  
**Can be changed:** U, T  
**Not for motor type:** REL  
**Scaling:** -  

#### p1660[0...n]
**Current setpoint filter 1 numerator natural frequency / \( I_{\text{set filt 1 fn z}} \)**

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sets the numerator natural frequency for current setpoint filter 1 (general filter).</td>
</tr>
<tr>
<td>Dependency</td>
</tr>
<tr>
<td>Current setpoint filter 1 is activated via p1656.0 and parameterized via p1657 ... p1661.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min</td>
<td>0.5 [Hz]</td>
<td>1999.0 [Hz]</td>
</tr>
<tr>
<td>Max</td>
<td>16000.0 [Hz]</td>
<td>0.700</td>
</tr>
</tbody>
</table>

**Access level:** 3  
**Calculated:** -  
**Func. diagram:** 5710, 6710  
**Units group:** -  
**Unit selection:** -  
**Expert list:** 1  
**Dynamic index:** DDS, p0180  
**Data type:** FloatingPoint32  
**P-Group:** Closed-loop control  
**Not for motor type:** REL  
**Can be changed:** U, T  
**Not for motor type:** REL  
**Scaling:** -  

#### p1661[0...n]
**Current setpoint filter 1 numerator damping / \( I_{\text{set filt 1 D_z}} \)**

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sets the numerator damping for current setpoint filter 1.</td>
</tr>
<tr>
<td>Dependency</td>
</tr>
<tr>
<td>Current setpoint filter 1 is activated via p1656.0 and parameterized via p1657 ... p1661.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min</td>
<td>0.000</td>
<td>10.000</td>
</tr>
<tr>
<td>Max</td>
<td>10.000</td>
<td>0.700</td>
</tr>
</tbody>
</table>

**Access level:** 3  
**Calculated:** -  
**Func. diagram:** 5710, 6710  
**Units group:** -  
**Unit selection:** -  
**Expert list:** 1  
**Dynamic index:** DDS, p0180  
**Data type:** Integer16  
**P-Group:** Closed-loop control  
**Not for motor type:** REL  
**Can be changed:** U, T  
**Not for motor type:** REL  
**Scaling:** -  

#### p1662[0...n]
**Current setpoint filter 2 type / \( I_{\text{set filt 2 Typ}} \)**

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sets the current setpoint filter 2 as low pass (PT2) or as extended general 2nd-order filter.</td>
</tr>
<tr>
<td>Value</td>
</tr>
<tr>
<td>1: Low pass: PT2</td>
</tr>
<tr>
<td>2: General 2nd-order filter</td>
</tr>
<tr>
<td>Dependency</td>
</tr>
<tr>
<td>Current setpoint filter 2 is activated via p1656.1 and parameterized via p1662 ... p1666.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Max</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

**Access level:** 3  
**Calculated:** -  
**Func. diagram:** 5710, 6710  
**Units group:** -  
**Unit selection:** -  
**Expert list:** 1  
**Dynamic index:** DDS, p0180  
**Data type:** Integer16  
**P-Group:** Closed-loop control  
**Not for motor type:** REL  
**Can be changed:** U, T  
**Not for motor type:** REL  
**Scaling:** -  

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SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3  
1-263
Note:
For an extended general 2nd-order filter, by inserting the same natural frequency in both the numerator and in the denominator, i.e. bandstop frequency, a bandstop filter is implemented. If the numerator damping of zero is selected, the bandstop frequency is completely suppressed.
The denominator damping can be determined from the equation for the 3 dB bandwidth:
\[ f_{3\text{dB bandwidth}} = 2 \times D_{\text{denominator}} \times f_{\text{bandstop frequency}} \]

**p1663[0...n]**
Current setpoint filter 2 denominator natural frequency / \( I_{\text{set_filt2 fn_n}} \)

- **SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**
- **Can be changed:** U, T
- **Data type:** FloatingPoint32
- **P-Group:** Closed-loop control
- **Units group:** -
- **Not for motor type:** REL
- **Min:** 0.5 [Hz]
- **Max:** 16000.0 [Hz]
- **Factory setting:** 1999.0 [Hz]

**Description:**
Sets the denominator natural frequency for current setpoint filter 2 (PT2, general filter).

**Dependency:**
Current setpoint filter 2 is activated via p1656.1 and parameterized via p1662 ... p1666.

**p1664[0...n]**
Current setpoint filter 2 denominator damping / \( I_{\text{set_filt2 D_n}} \)

- **SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**
- **Can be changed:** U, T
- **Data type:** FloatingPoint32
- **P-Group:** Closed-loop control
- **Scaling:** -
- **Expert list:** 1
- **Unit selection:** -
- **Units group:** -
- **Dynamic index:** DDS, p0180
- **Min:** 0.001
- **Max:** 10.000
- **Factory setting:** 0.700

**Description:**
Sets the denominator damping for current setpoint filter 2.

**Dependency:**
Current setpoint filter 2 is activated via p1656.1 and parameterized via p1662 ... p1666.

**p1665[0...n]**
Current setpoint filter 2 numerator natural frequency / \( I_{\text{set_filt2 fn_z}} \)

- **SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**
- **Can be changed:** U, T
- **Data type:** FloatingPoint32
- **P-Group:** Closed-loop control
- **Units group:** -
- **Not for motor type:** REL
- **Min:** 0.5 [Hz]
- **Max:** 16000.0 [Hz]
- **Factory setting:** 1999.0 [Hz]

**Description:**
Sets the numerator natural frequency for current setpoint filter 2 (general filter).

**Dependency:**
Current setpoint filter 2 is activated via p1656.1 and parameterized via p1662 ... p1666.

**p1666[0...n]**
Current setpoint filter 2 numerator damping / \( I_{\text{set_filt2 D_z}} \)

- **SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**
- **Can be changed:** U, T
- **Data type:** FloatingPoint32
- **P-Group:** Closed-loop control
- **Units group:** -
- **Not for motor type:** REL
- **Min:** 0.000
- **Max:** 10.000
- **Factory setting:** 0.700

**Description:**
Sets the numerator damping for current setpoint filter 2.

**Dependency:**
Current setpoint filter 2 is activated via p1656.1 and parameterized via p1662 ... p1666.
### p1699 Filter data acceptance / Filt data accept

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p1699</td>
<td>Activates data acceptance for parameter changes for the filter.</td>
<td>0 1 0</td>
</tr>
<tr>
<td>p1699 = 0</td>
<td>The new filter data are immediately accepted.</td>
<td></td>
</tr>
<tr>
<td>p1699 = 1</td>
<td>The new filter data are only accepted when this parameter is reset.</td>
<td></td>
</tr>
</tbody>
</table>

#### Dependency

### p1701[0...n] Current controller reference model dead time / I_ctrRefMod t_dead

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p1701</td>
<td>Sets the fractional dead time for the current controller reference model.</td>
<td>0.0 1.0 1.0</td>
</tr>
<tr>
<td></td>
<td>This parameter emulates the computing dead time of the proportionally controlled current control loop.</td>
<td></td>
</tr>
</tbody>
</table>

#### Note
Dead time = p1701 * p0115[0]

### p1715[0...n] Current controller P gain / I_ctrl Kp

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p1715</td>
<td>Sets the proportional gain of the current controller for the lower adaptation current range.</td>
<td>0.000 [V/A] 100.000 [V/A] 0.000 [V/A]</td>
</tr>
<tr>
<td></td>
<td>This value is automatically pre-set using p3900 or p0340 when commissioning has been completed.</td>
<td></td>
</tr>
</tbody>
</table>

#### Dependency
Refer to: p0391, p0392, p0393

#### Note
For p0393 = 100 %, the current controller adaptation is disabled and p1715 is effective over the entire range.

### p1717[0...n] Current controller integral-action time / I_ctrl Tn

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p1717</td>
<td>Sets the integral-action time of the current controller.</td>
<td>0.00 [ms] 1000.00 [ms] 2.00 [ms]</td>
</tr>
</tbody>
</table>

#### Dependency
Refer to: p1715
**r1732**

**Parameter:** Direct-axis voltage setpoint / Direct U set

**SERVO_S110-CAN,**
**SERVO_S110-DP,**
**SERVO_S110-PN**

Can be changed: -

Can be calculated: -

Data type: FloatingPoint32

Dynamic index: -

Access level: 3

Func. diagram: 1630, 5714, 6714, 6718

Units group: 5_1

Unit selection: p0505

Expert list: 1

Min

- [Vrms]

Max

- [Vrms]

Description:
Displays the direct-axis voltage setpoint Ud.

Note:
Induction motor (ASM):
The motor model is influenced for speeds/velocities greater than p1752.
Synchronous motor (SRM):
A monitoring (F07412) is activated for speeds/velocities greater than p1752.
The motor model is additionally influenced when kT adaptation is activated (p1780.3 = 1).

**r1733**

**Parameter:** Quadrature-axis voltage setpoint / Quad U set

**SERVO_S110-CAN,**
**SERVO_S110-DP,**
**SERVO_S110-PN**

Can be changed: -

Can be calculated: -

Data type: FloatingPoint32

Dynamic index: -

Access level: 3

Func. diagram: 1630, 5714, 5718, 6714, 6719

Units group: 5_1

Unit selection: p0505

Expert list: 1

Min

- [Vrms]

Max

- [Vrms]

Description:
Displays the quadrature-axis component of voltage setpoint Uq.

**p1752[0...n]**

**Parameter:** Motor model changeover speed operation with encoder / MotMod n_chgov enc

**SERVO_S110-CAN,**
**SERVO_S110-DP,**
**SERVO_S110-PN**

Can be changed: U, T

Can be calculated: CALC_MOD_REG

Data type: FloatingPoint32

Dynamic index: DDS, p0180

Units group: 3_1

Unit selection: p0505

Expert list: 1

Min

0.00 [rpm]

210000.00 [rpm]

Max

210000.00 [rpm]

Description:
Sets the speed to change over the motor model for operation with encoder.

Dependency:
Refer to: p1756

Note:
Induction motor (ASM):
The motor model is influenced for speeds/velocities greater than p1752.
Synchronous motor (SRM):
A monitoring (F07412) is activated for speeds/velocities greater than p1752.
The motor model is additionally influenced when kT adaptation is activated (p1780.3 = 1).

**p1755[0...n]**

**Parameter:** Motor model changeover speed encoderless operation / MotMod n_chgSnsor

**SERVO_S110-CAN,**
**SERVO_S110-DP,**
**SERVO_S110-PN**

Can be changed: U, T

Can be calculated: CALC_MOD_REG

Data type: FloatingPoint32

Dynamic index: DDS, p0180

Units group: 3_1

Unit selection: p0505

Expert list: 1

Min

0.00 [rpm]

210000.00 [rpm]

Max

210000.00 [rpm]

Description:
Sets the speed to change over the motor model to encoderless operation.

Dependency:
Refer to: p1756

Note:
The changeover speed applies for the changeover between open-loop and closed-loop control mode.
### List of parameters

#### p1756 Motor model changeover speed hysteresis / MotMod n_chgov hys

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DO, SERVO_S110-PN</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Can be changed:</strong> U, T</td>
</tr>
<tr>
<td><strong>Data type:</strong> FloatingPoint32</td>
</tr>
<tr>
<td><strong>P-Group:</strong> Closed-loop control</td>
</tr>
<tr>
<td><strong>Not for motor type:</strong> REL</td>
</tr>
<tr>
<td><strong>Min</strong></td>
</tr>
<tr>
<td>0.0 [%]</td>
</tr>
</tbody>
</table>

**Description:**
Sets the hysteresis for the changeover speed/velocity of the motor model.

**Dependency:**
Refer to: p1752, p1755

**Note:**
The value is entered relative to p1404, p1752 or p1755.

#### r1778 Motor model flux angle difference / MotMod ang. diff.

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DO, SERVO_S110-PN</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Can be changed:</strong> -</td>
</tr>
<tr>
<td><strong>Data type:</strong> FloatingPoint32</td>
</tr>
<tr>
<td><strong>P-Group:</strong> Closed-loop control</td>
</tr>
<tr>
<td><strong>Not for motor type:</strong> REL</td>
</tr>
<tr>
<td><strong>Min</strong></td>
</tr>
<tr>
<td>- [']</td>
</tr>
</tbody>
</table>

**Description:**
Induction motor (ASM):
Displays the difference between the motor model flux angle and the transformation angle.
Permanent-magnet synchronous motor (PESM):
Displays the angular difference between motor model and encoder.

**Dependency:**
A setting for smoothing the display can be made using p1754.

**Notice:**
The display only makes sense for corrected actual value inversion, encoder pulse number and pole pair number.

**Example:**
Moving in encoderless operation at a speed not equal to zero and without load.

--> Check the sign of r0061 and r0063. If the sign is not equal, then change p0410.0.

--> Check the stationary value of r0061 and r0063. If the value is not equal, change the encoder pulse number (p0408) or pole pair number (p0314).

#### p1800[0...n] Pulse frequency setpoint / Pulse freq setp

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DO, SERVO_S110-PN</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Can be changed:</strong> U, T</td>
</tr>
<tr>
<td><strong>Data type:</strong> FloatingPoint32</td>
</tr>
<tr>
<td><strong>P-Group:</strong> Modulation</td>
</tr>
<tr>
<td><strong>Not for motor type:</strong> -</td>
</tr>
<tr>
<td><strong>Min</strong></td>
</tr>
<tr>
<td>1.000 [kHz]</td>
</tr>
</tbody>
</table>

**Description:**
Sets the pulse frequency for the converter.
This parameter is pre-set to the rated converter value when the drive is first commissioned.

**Dependency:**
The pulse frequency can, depending on the current controller sampling time (p0115[0]) assume the following values:

a) \( p1800 = 1000 \times (p0115[0] \times n) \) mit \( n = 2, 3, 4, 5 \)
b) \( p1800 = 1000 \times n \times p0115[0] \) mit \( n = 1, 2, 3, 4, ... \)

**Example:**
p0115[0] = 125 µs \( \rightarrow \) p1800 = 1.6, 2, 2.6, 4 kHz (from equation a)
p0115[0] = 125 µs \( \rightarrow \) p1800 = 8, 16 kHz (from equation b)

Possible setting values can be taken from r0114 (if p0009 = p0010 = 0).

**Note:**
The maximum possible pulse frequency is also determined by the power unit being used.

When the pulse frequency is increased, depending on the particular power unit, the maximum output current can be reduced (derating, refer to r0067).
If p1800 is changed while commissioning (p0009, p0010 > 0), then it is possible that the old value will no longer be able to be set. The reason for this is that the dynamic limits of p1800 have been changed by a parameter that was set when the drive was commissioned (e.g. p1082).

For encoderless operation (p1404 = 0 or p1300 = 20), the following conditions apply:

\[
p1800 = \frac{1}{2 \cdot p0115[0]} \quad \text{or} \quad p1800 \geq n / p0115[0], \quad n = 1, 2, \ldots
\]

For motors with a low power rating (< 300 W) we recommend that p1800 is set acc. to the second condition.

### p1810 Modulator configuration / Modulator config

<table>
<thead>
<tr>
<th>Bit field:</th>
<th>Name</th>
<th>Signal</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Current controller dynamics higher</td>
<td>Yes</td>
<td>0 signal</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:**
Sets the configuration for the modulator.

**Note:**
Re bit 11:
- Precondition:
  - firmware version 4.4 or higher for the Control Unit and power unit.
  - booksize power unit (r0192.27 = 1).
  - current controller sampling time p0115[0] >= 62.5 µs.
  - for a Double Motor Module the two drive controls must be operated with the same current controller sampling time (p0115[0]). Otherwise, the higher current controller dynamics can only be activated on the drive with the longer sampling time.
  - it is not permissible that the "safety without encoder" is activated (p9306/p9506).

The following changes are necessary after changing bit 11:
- computing dead time (p0118 = 22 µs for bit 11 = 1, p0118 = 0 µs for bit 11 = 0).
- controller gains (p1715, p1460).
- with p3040 = 4 computing dead time and controller gains can be automatically pre-assigned. It may be necessary to still optimize the speed controller.

Before commissioning for the first time (p3925.0 = 0 for all data sets) this parameter is automatically preassigned to the optimum value.

### p1818 Phase for PWM generation configuration / Ph for PWM config

<table>
<thead>
<tr>
<th>Bit field:</th>
<th>Name</th>
<th>Signal</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Current controller dynamics higher</td>
<td>Yes</td>
<td>0 signal</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:**
Sets the phase shift for offset clocking.

**Note:**
A change only becomes effective after a POWER ON.

The parameter is not influenced by setting the factory setting.
p1821[0...n]  Dir of rot / Dir of rot

SERVO_S110-CAN,  
SERVO_S110-DP,  
SERVO_S110-PN

Can be changed: C2(3)
Data type: Integer16
P-Group: Motor
Not for motor type: -
Min: 0
Max: 1
Factory setting: 0

Description:
Setting to change the direction of rotation.
If the parameter is changed, it reverses the direction of rotation of the motor and the encoder actual value without changing the setpoint.

Value:
0: CW
1: CCW

Dependency:
Refer to: F07434

Note:
For operation with the phase sequence U/V/W, the direction of rotation is defined when viewing the face side of the motor output shaft.
When changing the direction of rotation, the rotating field direction of the current controller is reversed. The speed actual value (e.g. r0063) is also reversed so that the control sense is kept and internally causing the direction of rotation to be reversed with the same setpoint. Further, the position actual values of the actual encoder are reversed (e.g. r0482[0...2]).

p1909[0...n]  Motor data identification control word / MotID STW

SERVO_S110-CAN,  
SERVO_S110-DP,  
SERVO_S110-PN

Can be changed: T
Data type: Unsigned16
P-Group: Motor identification
Not for motor type: -
Min: -
Max: -
Factory setting: 0010 0111 0000 0000 bin

Description:
Sets the configuration for the motor data identification.
Recommend.: For the stationary motor data identification, if a motor holding brake is being used it should be opened and the motor finely synchronized before the measurement. This should only be done if it can be safely carried out and no external forces can act on the motor. This determines the angular commutation offset (p1909.13, p0431).

Bit field:
08 Measure D inductance
09 Measure Q inductance
10 Magnetizing field inductance and measure rotor resistance
13 Measure commutation angle and direction of rotation
14 Determining the voltage emulation error

Dependency:
Refer to: p1910, r1912, r1913, r1915, r1925, r1927, r1932, r1933, r1934, r1935, r1936, r1950, r1951

Note:
For an induction motor (ASM) the following bits: 8, 9, 13 are effective
For a synchronous motor (SRM) the following bits: 8, 9, 13, 14 are effective
Re bit 14:
- after successfully determining the voltage emulation error, the display of the phase voltage actual values r0089 and the active power actual value r0082 and the torque actual value r0080 are significantly more accurate.
- the voltage emulation errors should be identified with the Motor Module in the warm state.
- the motor temperature (r0035) should not change significantly (i.e. it should not be identified immediately after a load duty cycle).
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Recommend.</th>
<th>Dependency</th>
<th>Caution</th>
<th>Notice</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p1910</td>
<td>Motor data identification routine, stationary (standstill) / MotID standstill</td>
<td>Setting to control the motor data identification with the motor stationary.</td>
<td>Setting to control the motor data identification with the motor stationary.</td>
<td>Setting to control the motor data identification with the motor stationary.</td>
<td>Setting to control the motor data identification with the motor stationary.</td>
<td>Setting to control the motor data identification with the motor stationary.</td>
<td>Setting to control the motor data identification with the motor stationary.</td>
</tr>
<tr>
<td>r1912</td>
<td>Stator resistance identified / R_stator ident</td>
<td>Displays the identified stator resistance.</td>
<td>Displays the identified stator resistance.</td>
<td>Displays the identified stator resistance.</td>
<td>Displays the identified stator resistance.</td>
<td>Displays the identified stator resistance.</td>
<td>Displays the identified stator resistance.</td>
</tr>
<tr>
<td>r1913</td>
<td>Rotor time constant identified / T_rotor ident</td>
<td>Displays the identified rotor time constant.</td>
<td>Displays the identified rotor time constant.</td>
<td>Displays the identified rotor time constant.</td>
<td>Displays the identified rotor time constant.</td>
<td>Displays the identified rotor time constant.</td>
<td>Displays the identified rotor time constant.</td>
</tr>
</tbody>
</table>
## List of parameters

### r1915 Stator inductance identified / L_stator ident

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Data type</th>
<th>P-Group</th>
<th>Not for motor type</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>r1915</td>
<td>Displays the identified stator inductance.</td>
<td>FloatingPoint32</td>
<td>Motor identification</td>
<td>- [mH]</td>
<td>- [mH]</td>
<td>- [mH]</td>
<td></td>
</tr>
</tbody>
</table>

Dependency: Displays the identified stator inductance.

Refer to: p1909, p1910, r1912, r1913, r1925, r1927, r1932, r1933, r1934, r1935, r1936, r1950, r1951

### r1925 Threshold voltage identified / U_threshold ident

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Data type</th>
<th>P-Group</th>
<th>Not for motor type</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>r1925</td>
<td>Displays the identified threshold voltage of the power unit.</td>
<td>FloatingPoint32</td>
<td>Motor identification</td>
<td>- [Vrms]</td>
<td>- [Vrms]</td>
<td>- [Vrms]</td>
<td></td>
</tr>
</tbody>
</table>

Dependency: Displays the identified threshold voltage of the power unit.

Refer to: p1909, p1910, r1912, r1913, r1915, r1927, r1932, r1933, r1934, r1935, r1936, r1950, r1951

### r1927 Rotor resistance identified / R_rotor ident

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Data type</th>
<th>P-Group</th>
<th>Not for motor type</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>r1927</td>
<td>Displays the identified rotor resistance.</td>
<td>FloatingPoint32</td>
<td>Motor identification</td>
<td>- [ohm]</td>
<td>- [ohm]</td>
<td>- [ohm]</td>
<td></td>
</tr>
</tbody>
</table>

Dependency: Displays the identified rotor resistance.

Refer to: p1909, p1910, r1912, r1913, r1915, r1925, r1932, r1933, r1934, r1935, r1936, r1950, r1951

### r1932[0...19] d inductance identified / Ld ident

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Data type</th>
<th>P-Group</th>
<th>Not for motor type</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>r1932</td>
<td>Displays the identified (differential) d-inductance.</td>
<td>FloatingPoint32</td>
<td>Motor identification</td>
<td>- [mH]</td>
<td>- [mH]</td>
<td>- [mH]</td>
<td></td>
</tr>
</tbody>
</table>

Dependency: Displays the identified (differential) d-inductance.

Refer to: p1909, p1910, r1912, r1913, r1915, r1925, r1927, r1932, r1933, r1934, r1935, r1936, r1950, r1951

Note: The Ld characteristic consists of the value pairs from p1932 and p1934 with the same index. This value corresponds to the value of the total leakage inductance (r0377).

### r1933[0...19] d inductance identification current / Ld I_ident

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Data type</th>
<th>P-Group</th>
<th>Not for motor type</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>r1933</td>
<td>Displays the identification current of the d inductance.</td>
<td>FloatingPoint32</td>
<td>Motor identification</td>
<td>- [Arms]</td>
<td>- [Arms]</td>
<td>- [Arms]</td>
<td></td>
</tr>
</tbody>
</table>

Dependency: Displays the identification current of the d inductance.

Refer to: p1909, p1910, r1912, r1913, r1915, r1925, r1927, r1932, r1934, r1935, r1936, r1950, r1951
Note: The Ld characteristic consists of the value pairs from p1932 and p1933 with the same index.

**r1934[0...9]**  
q inductance identified / Lq ident  
- SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
- Can be changed: -  
- Calculated: -  
- Access level: 3  
- Data type: FloatingPoint32  
- Dynamic index: -  
- Function diagram: -  
- P-Group: Motor identification  
- Units group: -  
- Unit selection: -  
- Not for motor type: -  
- Scaling: -  
- Expert list: 1  
- Min - [mH]  
- Max - [mH]  
- Factory setting - [mH]

**Description:** Displays the identified (differential) q-inductance.

**Dependency:**  
Refer to: p1909, p1910, r1932, r1933

**Note:**  
The Lq characteristic consists of the value pairs from p1934 and p1935 with the same index.

This value corresponds to the value of the total leakage inductance (r0377).

**r1935[0...20]**  
Identification current / I_ident  
- SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
- Can be changed: -  
- Calculated: -  
- Access level: 3  
- Data type: FloatingPoint32  
- Dynamic index: -  
- Function diagram: -  
- P-Group: Motor identification  
- Units group: -  
- Unit selection: -  
- Not for motor type: -  
- Scaling: -  
- Expert list: 1  
- Min - [Arms]  
- Max - [Arms]  
- Factory setting - [Arms]

**Description:** Displays the identification current for the identification of the q-inductance ([0...9]) as well as the torque constant ([10]) and the torque characteristic ([11...20]).

**Index:**  
[0] = q inductance identification current measuring point 1  
[1] = q inductance identification current measuring point 2  
[2] = q inductance identification current measuring point 3  
[3] = q inductance identification current measuring point 4  
[4] = q inductance identification current measuring point 5  
[5] = q inductance identification current measuring point 6  
[6] = q inductance identification current measuring point 7  
[7] = q inductance identification current measuring point 8  
[8] = q inductance identification current measuring point 9  
[9] = q inductance identification current measuring point 10  
[10] = Torque constant identification current  
[12] = Torque characteristic identification current measuring point 2  
[14] = Torque characteristic identification current measuring point 4  
[16] = Torque characteristic identification current measuring point 6  
[17] = Torque characteristic identification current measuring point 7  
[18] = Torque characteristic identification current measuring point 8  
[19] = Torque characteristic identification current measuring point 9  
[20] = Torque characteristic identification current measuring point 10

**Dependency:**  
Refer to: p1909, p1910, r1934, p1959, p1960

**Note:**  
- The Lq characteristic consists of the value pairs from r1934 and r1935 with the same index.  
- the torque constant is identified with the current r1935[10] and displayed in r1937[0]. If the reluctance torque constant is identified (p1959.7 = 1), the torque constant is identified with 150% rated current (p0305), otherwise with 100% rated current.  
- the torque characteristic (r1937[1...10]) is identified in the range between the rated current (p0305) and the maximum current (p0640) (r1935[11...20]).
**List of parameters**

### r1936 Magnetizing inductance identified / L_H ident

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

**Description:** Displays the identified magnetizing inductance (gamma equivalent circuit diagram).

**Dependency:** Refer to: p1909, p1910, r1913, r1915, r1927, p1959, p1960, r1962, r1963

**Note:** This value corresponds to the value of the transformed magnetizing inductance (r0382).

### r1937[0...10] Torque constant identified / kT ident

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

**Description:** Displays the identified torque constant/torque characteristic over the q current.

**Index:**

- [0] = Torque constant identified
- [1] = Torque characteristic identified measuring point 1
- [2] = Torque characteristic identified measuring point 2
- [3] = Torque characteristic identified measuring point 3
- [4] = Torque characteristic identified measuring point 4
- [5] = Torque characteristic identified measuring point 5
- [6] = Torque characteristic identified measuring point 6
- [7] = Torque characteristic identified measuring point 7
- [8] = Torque characteristic identified measuring point 8
- [9] = Torque characteristic identified measuring point 9
- [10] = Torque characteristic identified measuring point 10

**Dependency:** Refer to: r1938, r1939, p1959, p1960, r1969

**Note:**

- the value in r1937[0] corresponds to the torque constant (p0316) and was identified with the current in r1935[10]. If the reluctance torque is identified (p1959.7 = 1), the torque constant is identified with 150% rated current (p0305), otherwise with 100% rated current.
- if indices r1937[1...10] are not equal to zero, they show the values of the torque characteristic identified for the current in r1935[11...20]. The torque characteristic is identified in the range between rated current (p0305) and maximum current (p0640).

### r1938 Voltage constant identified / kE ident

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

**Description:** Displays the identified voltage constant.

**Dependency:** Refer to: r1937, r1939, p1959, p1960, r1969

**Note:** This value corresponds to the voltage constant (p0317).
## Parameter List of parameters

### r1939 Reluctance torque constant identified / kT_reluct_ident

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed: -</td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
</tr>
<tr>
<td>P-Group: Motor identification</td>
</tr>
</tbody>
</table>

#### Not for motor type: -

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>- [mH]</td>
<td>- [mH]</td>
<td>- [mH]</td>
</tr>
</tbody>
</table>

#### Description:
Displays the identified reluctance torque constant.

#### Dependency:
Refer to: r1937, r1938, p1959, p1960, r1969

#### Note:
This value corresponds to the reluctance torque constant (p0328).

### r1947 Optimum load angle identified / phi_load_ident

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed: -</td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
</tr>
<tr>
<td>P-Group: Motor identification</td>
</tr>
</tbody>
</table>

#### Not for motor type: -

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>- [']</td>
<td>- [']</td>
<td>- [']</td>
</tr>
</tbody>
</table>

#### Description:
Displays the identified, optimum load angle.

#### Note:
This value corresponds to the optimum load angle (p0327).

### r1948 Magnetizing current identified / I_mag_ident

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed: -</td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
</tr>
<tr>
<td>P-Group: Motor identification</td>
</tr>
</tbody>
</table>

#### Not for motor type: -

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>- [Arms]</td>
<td>- [Arms]</td>
<td>- [Arms]</td>
</tr>
</tbody>
</table>

#### Description:
Displays the identified magnetizing current.

#### Dependency:
Refer to: r1936, p1959, p1960

#### Note:
This value corresponds to the magnetizing current (p0320 / r0331).

### r1950[0...19] Voltage emulation error voltage values / U_error_U_values

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed: -</td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
</tr>
<tr>
<td>P-Group: Motor identification</td>
</tr>
</tbody>
</table>

#### Not for motor type: -

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>- [V]</td>
<td>- [V]</td>
<td>- [V]</td>
</tr>
</tbody>
</table>

#### Description:
The identified characteristic of the voltage emulation error is displayed r1950[0...19] and r1951[0...19].

#### Dependency:
Refer to: r1951

### r1951[0...19] Voltage emulation error current values / U_error_I_error

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed: -</td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
</tr>
<tr>
<td>P-Group: Motor identification</td>
</tr>
</tbody>
</table>

#### Not for motor type: -

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>- [A]</td>
<td>- [A]</td>
<td>- [A]</td>
</tr>
</tbody>
</table>

#### Description:
The identified characteristic of the voltage emulation error is displayed r1950[0...19] and r1951[0...19].

#### Dependency:
Refer to: r1950
### p1958[0...n] Rotating measurement ramp-up/ramp-down time / Rot meas t_r up/dn

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Recommended</th>
<th>Dependency</th>
<th>Notice</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Sets the ramp-up/ramp-down time for the rotating measurement. When the function module &quot;extended setpoint channel&quot; is activated (r0108.8 = 1), the maximum of the ramp-up/ramp-down time of the setpoint channel becomes effective. When this function module is inactive, then no ramp-up/ramp-down time is effective. The following applies for positive values: The selected ramp-up/ramp-down time becomes effective.</td>
<td>A ramp-up/ramp-down time should not be activated for the motor data identification (p1958 = 0) as long as this can be safely done without incurring any danger. This means that the identification is complete and more accurate. When the ramp-up/ramp-down time is activated, the following steps of the rotating motor data identification are not executed: - p1959.5 (identifying the q inductance) - p1959.7 (identifying the reluctance torque constant)</td>
<td>Refer to: p1959, p1960</td>
<td>The step p1959.8 (identify q inductance on the test stand) may only be selected if the drive can be kept at zero speed or at a fixed speed either using a test stand or other mechanical measures. During steps p1959.2 (identifying the moment of inertia) and p1959.6 (identifying the torque constant) the Vdc_min controller is disabled (p1240).</td>
</tr>
</tbody>
</table>

**Parameter**

<table>
<thead>
<tr>
<th>p1958[0...n]</th>
<th>Rotating measurement ramp-up/ramp-down time / Rot meas t_r up/dn</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</strong></td>
<td><strong>Can be changed:</strong> T</td>
</tr>
<tr>
<td><strong>Data type:</strong> FloatingPoint32</td>
<td><strong>Calculated:</strong> -</td>
</tr>
<tr>
<td><strong>P-Group:</strong> Motor identification</td>
<td><strong>Access level:</strong> 2</td>
</tr>
<tr>
<td><strong>Not for motor type:</strong> -</td>
<td><strong>Dynamic index:</strong> MDS, p0130</td>
</tr>
<tr>
<td><strong>Min</strong></td>
<td><strong>Func. diagram:</strong> -</td>
</tr>
<tr>
<td><strong>Max</strong></td>
<td><strong>Units group:</strong> -</td>
</tr>
<tr>
<td>-1.00 [s]</td>
<td><strong>Unit selection:</strong> -</td>
</tr>
<tr>
<td>999999.00 [s]</td>
<td><strong>Expert list:</strong> 1</td>
</tr>
<tr>
<td>-1.00 [s]</td>
<td><strong>Factory setting</strong></td>
</tr>
</tbody>
</table>

**Description:**

Sets the ramp-up/ramp-down time for the rotating measurement.

**Recommend:**

<table>
<thead>
<tr>
<th>p1959[0...n]</th>
<th>Rotating measurement configuration / Rot meas config</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</strong></td>
<td><strong>Can be changed:</strong> T</td>
</tr>
<tr>
<td><strong>Data type:</strong> Unsigned16</td>
<td><strong>Calculated:</strong> CALC_MOD_ALL</td>
</tr>
<tr>
<td><strong>P-Group:</strong> Motor identification</td>
<td><strong>Access level:</strong> 3</td>
</tr>
<tr>
<td><strong>Not for motor type:</strong> REL</td>
<td><strong>Dynamic index:</strong> MDS, p0130</td>
</tr>
<tr>
<td><strong>Min</strong></td>
<td><strong>Func. diagram:</strong> -</td>
</tr>
<tr>
<td><strong>Max</strong></td>
<td><strong>Units group:</strong> -</td>
</tr>
<tr>
<td>-</td>
<td><strong>Unit selection:</strong> -</td>
</tr>
<tr>
<td>-0000 1110 1110 0111 bin</td>
<td><strong>Expert list:</strong> 1</td>
</tr>
</tbody>
</table>

**Description:**

Sets the configuration of the rotating measurement.

**Recommend:**

A direction inhibit should not be activated for the rotating measurement (p1959.14 = 1 and p1959.15 = 1) as long as this can be done without incurring any danger. This means that the identification is complete and more accurate. When the direction inhibit is activated, the reluctance torque constant (p1959.7) is not identified and the angular commutation offset (p1959.10, p0431) is inaccurately determined. The reluctance torque constant (p1959.7) is also not identified in encoderless operation.

**Dependency:**

Refer to: p1958, p1960

**Notice:**

The step p1959.8 (identify q inductance on the test stand) may only be selected if the drive can be kept at zero speed or at a fixed speed either using a test stand or other mechanical measures. During steps p1959.2 (identifying the moment of inertia) and p1959.6 (identifying the torque constant) the Vdc_min controller is disabled (p1240).
During step p1959.7 (identifying the reluctance torque constant) the Vdc_min controller and Vdc_max controller are disabled (p1240).

**Note:**

For an induction motor (ASM), the following bits 1, 2, 5, 8, 9, 10, 14, 15 are effective
For a synchronous motor (SRM), the following bits 2, 5, 6, 7, 8, 10, 14, 15 are effective

Re bit 05:

For "motor holding brake the same as sequence control" (p1215 = 1 or 3), the Lq characteristic is only measured up to approximately the rated motor current (p0305) instead of up to the current limit (p0640). Before carrying out the rotation measurement for motors with brake, the brake should be opened (p1215 = 2) - as long as this can be done without incurring any danger.

Re bit 10:

If the motor holding brake is set just the same as the sequence control (p1215 = 1 or 3), the commutation angle and the direction of rotation are not measured. Before carrying out the rotation measurement for motors with brake, the brake should be opened (p1215 = 2) - as long as this can be done without incurring any danger.

Re bit 14, 15:

The following applies for bit 14 and 15 = 0:

When the function module "extended setpoint channel" is activated (r0108.8 = 1), the direction inhibit of the setpoint channel becomes effective. No direction of inhibit is effective if the function module is inactive.

The following applies for minimum bit 14 = 1 or bit 15 = 1:

The direction inhibit set in p1959 becomes effective.

### p1960 Rotating measurement selection / Rot meas sel

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
<th>Access level</th>
<th>Data type</th>
<th><em>units group</em></th>
<th>Units group</th>
<th>Expert list</th>
</tr>
</thead>
<tbody>
<tr>
<td>-3:</td>
<td>Accept identified parameters</td>
<td>2</td>
<td>Integer16</td>
<td>motor identification</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>-2:</td>
<td>Acknowledge encoder inversion actual value (F07993)</td>
<td>access to encoder inverters</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>-1:</td>
<td>Start motor data identification without acceptance</td>
<td>2</td>
<td>Integer16</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>0:</td>
<td>Inactive/inhibit</td>
<td>2</td>
<td>Integer16</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1:</td>
<td>Start motor data identification with acceptance</td>
<td>2</td>
<td>Integer16</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Description:**

Activates the rotating measurement.

**Value:**

-3: Accept identified parameters
-2: Acknowledge encoder inversion actual value (F07993)
-1: Start motor data identification without acceptance
0: Inactive/inhibit
1: Start motor data identification with acceptance

**Recommend.:**

Before carrying out the rotation measurement for motors with brake, the brake should be opened (p1215 = 2) - as long as this can be done without incurring any danger. The commutation angle and the direction are also determined.

**Dependency:**

Refer to: r1933, r1934, r1935, r1936, r1937, r1938, r1939, r1947, r1948, p1958, p1959, r1962, r1963, r1969
Refer to: F07990, A07991, F07993

**Danger:**

For the rotating measurement, the motor is accelerated up to the maximum speed. Only the parameterized current limit (p0640) and the maximum speed (p1082) are effective.

The behavior of the motor can be influenced using the direction inhibit (p1959.14, p1959.15) and the ramp-up/ramp-down time (p1958).

**Notice:**

If there is a motor holding brake, it must be open (p1215 = 2).

To permanently accept the determined settings they must be saved in a non-volatile fashion (p0971, p0977).

**Note:**

The rotating measurement can only be selected when the pulses of all of the drive objects of the Control Unit have been suppressed. After selection, all of the other drive objects of the Control Unit are interlocked so that they cannot be powered up until the rotating measurement has been completed or de-selected.

When the rotating measurement is activated (p1960 = 1), it is not possible to save the parameters (p0971, p0977).
**List of parameters**

### r1962[0...9] Saturation characteristic magnetizing current identified / Sat_char I_mag
- **SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**
- **Can be changed:** -
- **Calculated:** -
- **Access level:** 3
- **Data type:** FloatingPoint32
- **Dynamic index:** -
- **Func. diagram:** -
- **P-Group:** Motor identification
- **Units group:** -
- **Unit selection:** -
- **Not for motor type:** PEM, REL
- **Scaling:** -
- **Expert list:** 1
- **Min:** - [%]
- **Max:** - [%]
- **Factory setting:** - [%]

**Description:** Displays the magnetizing currents of the identified saturation characteristic. The values are referred to r0331.

**Dependency:** Refer to: p1959, p1960, r1963

**Note:** The saturation characteristic consists of the value pairs from p1962 and p1963 with the same index.

### r1963[0...9] Saturation characteristic stator flux identified / Sat_char flux
- **SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**
- **Can be changed:** -
- **Calculated:** -
- **Access level:** 3
- **Data type:** FloatingPoint32
- **Dynamic index:** -
- **Func. diagram:** -
- **P-Group:** Motor identification
- **Units group:** -
- **Unit selection:** -
- **Not for motor type:** PEM, REL
- **Scaling:** -
- **Expert list:** 1
- **Min:** - [%]
- **Max:** - [%]
- **Factory setting:** - [%]

**Description:** Displays the stator flux of the identified saturation characteristic. The values are referred to the stator flux at the magnetizing current (r0331).

**Dependency:** Refer to: p1959, p1960, r1962

**Note:** The saturation characteristic consists of the value pairs from p1962 and p1963 with the same index.

### r1969 Moment of inertia identified / M_inertia ident
- **SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**
- **Can be changed:** -
- **Calculated:** -
- **Access level:** 3
- **Data type:** FloatingPoint32
- **Dynamic index:** -
- **Func. diagram:** -
- **P-Group:** Motor identification
- **Units group:** 25_1
- **Unit selection:** p0100
- **Not for motor type:** REL
- **Scaling:** -
- **Expert list:** 1
- **Min:** - [kgm²]
- **Max:** - [kgm²]
- **Factory setting:** - [kgm²]

**Description:** Displays the identified moment of inertia.

**Dependency:** IEC drives (p0100 = 0): unit kg m²
NEMA drives (p0100 = 1): unit lb ft²
Refer to: p0341, p0342, p1498, p1959, p1960

### r1973[0...1] Encoder, pulse number identified / Pulse No. ident
- **SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**
- **Can be changed:** -
- **Calculated:** -
- **Access level:** 3
- **Data type:** Integer32
- **Dynamic index:** -
- **Func. diagram:** -
- **P-Group:** Motor identification
- **Units group:** -
- **Unit selection:** -
- **Not for motor type:** REL
- **Scaling:** -
- **Expert list:** 1
- **Min:** -
- **Max:** -
- **Factory setting:** -

**Description:**
- **Index 0:** Rotating motors: Displays the identified encoder pulse number (per revolution).
- **Index 1:** Rotating motors: No significance.

**Index:**
- [0] = Rotating motor encoder pulse number
- [1] = Linear motor, grid division in mm

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SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3
**p1980[0...n]**  
**PolID technique / PolID technique**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
<th>Notice</th>
<th>Dependency</th>
<th>Expert list</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</strong></td>
<td><strong>Can be changed:</strong> U, T</td>
<td><strong>Can be changed:</strong> Saturation-based 1st + 2nd harmonics</td>
<td>Due to the measuring accuracy (approx. 5 %) only the approximate value is shown in p1973 and may not be directly transferred into p0407 or p0408. An incorrect pole pair number (p0313, p0314) or pole pair width (p0315) results in an incorrect value in p1973.</td>
<td>If the incorrect technique is applied, this can cause the motor to accelerate in an uncontrolled fashion. Under the following conditions, the integral time must be disabled (p1996 = 0):</td>
<td><strong>Refer to:</strong> p0325, p0329, p1981, p1982, p1983, r1984, r1985, r1986, r1987, p1990, r1992, p1993, p1994, p1995, p1996, p1997</td>
<td><strong>F07995</strong></td>
</tr>
<tr>
<td><strong>P-Group:</strong> Motor identification</td>
<td><strong>Not for motor type:</strong> -</td>
<td><strong>Saturation-based 1st harmonics</strong></td>
<td>A negative signal indicates an incorrect polarity of the encoder signal.</td>
<td><strong>Refer to:</strong> F07995</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Min</strong></td>
<td><strong>Max</strong></td>
<td><strong>0</strong></td>
<td><strong>99</strong></td>
<td><strong>Note:</strong> PolID: Pole position identification When commissioning a catalog motor, the technique is automatically selected depending on the motor type being used. The following applies for 1FN3 motors: A technique with 2nd harmonic may not be used (do not use p1980 = 0, 4). For 1FN7 motors, the following applies: A two-stage technique may not be used (do not use p1980 = 4). The automatically set value in p0329 may not be changed.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**p1981[0...n]**  
**PolID distance max / PolID distance max**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
<th>Notice</th>
<th>Dependency</th>
<th>Expert list</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>P-Group:</strong> Motor identification</td>
<td><strong>Not for motor type:</strong> -</td>
<td><strong>Motion-based</strong></td>
<td><strong>Note:</strong> Value = 180 &quot;.: Monitoring is de-activated.</td>
<td><strong>Refer to:</strong> F07995</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Min</strong></td>
<td><strong>Max</strong></td>
<td><strong>0 ['']</strong></td>
<td><strong>180 ['']</strong></td>
<td><strong>0 ['']</strong></td>
<td><strong>10 ['']</strong></td>
<td><strong>Note:</strong> PolID: Pole position identification</td>
</tr>
</tbody>
</table>

**Description:**
- PolID technique / PolID technique
  - Sets the pole position identification technique.
  - **Value:**
    - 0: Saturation-based 1st + 2nd harmonics
    - 1: Saturation-based 1st harmonics
    - 4: Saturation based 2-stage
    - 10: Motion-based
    - 99: No technique selected
  - **Dependency:**
  - **Notice:**
    - If the incorrect technique is applied, this can cause the motor to accelerate in an uncontrolled fashion.
    - Under the following conditions, the integral time must be disabled (p1996 = 0):
      - p1980 = 10 (motion-based)
      - motor encoder with track A/B sq-wave (p0404.3 = 1)
      - p0430.20 = 0 (flank time measurement)
    - Once the integral time has been disabled, the motion is increased during the identification (a minimum of 90 ° electrical). As a result of this, the maximum distance (p1981) must also be increased.

**Description:**
- PolID distance max / PolID distance max
  - Sets the maximum distance (electrical angle) when carrying out the pole position identification routine.
  - If this distance (travel) is exceeded, an appropriate fault is output.
  - **Notice:**
    - Value = 180 °.: Monitoring is de-activated.
### p1982[0...n] PolID selection / PolID selection

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
<th>Can be changed: T</th>
<th>Calculated: -</th>
<th>Access level: 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type: Integer16</td>
<td>Dynamic index: MDS, p0130</td>
<td>Func. diagram: -</td>
<td></td>
</tr>
<tr>
<td>P-Group: Motor identification</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>2</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Activates the pole position identification routine to determine the commutation angle and to carry out a plausibility check.

**Value:**
- 0: Pole position identification off
- 1: Pole position identification for commutation
- 2: Pole position identification for plausibility check

**Recommend.:**
- Re p1982 = 1:
  - This is used for synchronous motors with motor encoder without absolute data. The information/data regarding the absolute commutation angle is supplied via a track C/D, Hall sensors, an absolute encoder or from the pole position identification routine.
  - Re p1982 = 2:
    - This is used for synchronous motor with motor encoder with absolute data to check this data.


**Note:** PolID: Pole position identification

### p1983 PolID test / PolID test

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
<th>Can be changed: U, T</th>
<th>Calculated: -</th>
<th>Access level: 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type: Unsigned16</td>
<td>Dynamic index: -</td>
<td>Func. diagram: -</td>
<td></td>
</tr>
<tr>
<td>P-Group: Motor identification</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Starts the pole position identification routine for test purposes.

- p1983 = 1:
  - Start of pole position identification. The parameter is set to zero automatically on completion of the identification process.


**Notice:** For p1983 = 1 and if the pulses are not enabled, then the function is only executed the next time that the pulses are enabled.

**Note:** When this test is executed, it does not influence the commutation angle.

### r1984 PolID angular difference / PolID ang diff

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
<th>Can be changed: -</th>
<th>Calculated: -</th>
<th>Access level: 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type: FloatingPoint32</td>
<td>Dynamic index: -</td>
<td>Func. diagram: -</td>
<td></td>
</tr>
<tr>
<td>P-Group: Motor identification</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td>- [°]</td>
<td>- [°]</td>
<td>- [°]</td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Displays the angular difference between the actual electrical commutation angle and the angle determined by the pole position identification.


**Note:**
- PolID: Pole position identification
- When the pole position identification routine is executed several times using p1983, the spread of the measured values can be determined using this value. At the same position, the spread should be less than 2 degrees electrical.
### Parameter

**List of parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>r1986</td>
<td>Displays the pole position characteristic of the elasticity-based pole position identification routine.</td>
<td></td>
<td>PolID: Pole position identification. The values for the characteristic of the last pole position identification routine are output every 1 ms in order to record signals (e.g. trace).</td>
</tr>
</tbody>
</table>
### p1990 Encoder adjustment, determine angular commutation offset / Enc_adj det ang

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>p1990</td>
<td>Can be changed: U, T, Calculated: -</td>
<td>Encoder adjustment, determine angular commutation offset / Enc_adj det ang</td>
</tr>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Data type: Integer16, Dynamic index: -</td>
<td></td>
</tr>
<tr>
<td>P-Group: Motor identification</td>
<td>Units group: -</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

**Description:**
This function is only required for synchronous motors and can be started when commissioning for the first time or after replacing an encoder. The function acts on the active motor data set. When adjusting the encoder, the angular commutation offset is determined and transferred into p0431. Alarm A07971 is output while the angular commutation offset is being determined. p1990 is automatically set to 0 after the angular commutation offset has been determined.

- **p1990 = 0:** De-activated
- **p1990 = 1:** Activated with transfer

**Dependency:**
Refer to: A07971

**Caution:**
In order to prevent an incorrect orientation of the electrical pole position (uncontrolled motor movement), the automatically determined angular commutation offset (p0431) should, for reasons of safety, be checked using one of the following recommendations:

- **Recommendation 1:**
  - Set encoderless operation (p1300 = 20 or p1404 = 0), de-select pole position identification (p1982 = 0), operate under no-load conditions with a speed > p1755, correct the actual value inversion (p0410.0) (e.g. r0061 = r0063), read the angular error in r1778; the result in r1778 should be approximately 0, for |r1778| > 2 degrees, add the value to p0431 - taking into account the sign - and enter in p0431.

- **Recommendation 2:**
  - Set the current limit to 0 (p0640 = 0), activate travel to fixed stop (p1545 = 1), record r0089[0] (phase voltage) and r0093 (electrically scaled pole position) (e.g. trace) while the motor is externally moved; in this case, the rising zero crossover of the phase voltage must coincide with the 360 ° --> 0 ° step (jump) from r0093.

- **Recommendation 3:**
  - Measure the phase voltage U (measure phase U with respect to the virtual star point using 3 resistors) and r0093 (electrically scaled pole position); the rising zero crossover of the phase voltage must coincide with the 360 ° --> 0 ° step (jump) of r0093.

- **Recommendation 4:**
  - Determine the average value from several results of a pole position identification routine executed as test (p1983) at various electrical angles and add the value to p0431 - taking into account the sign and enter into p0431.

**Notice:**
For p1990 = 1 and with the pulses not enabled, the function is only executed the next time that the pulses are enabled.

**Note:**
If fault F07414 is present, the following applies:
First set p1990 to 1, then acknowledge the fault and then issue the enable signals.

### p1991[0...n] Motor changeover, angular commutation correction / Ang_com corr

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>p1991</td>
<td>Can be changed: T, Calculated: -</td>
<td>Motor changeover, angular commutation correction / Ang_com corr</td>
</tr>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Data type: FloatingPoint32, Dynamic index: MDS, p0130</td>
<td></td>
</tr>
<tr>
<td>P-Group:</td>
<td>Units group: -</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
</tr>
<tr>
<td>-180 [°]</td>
<td>180 [°]</td>
<td>0 [°]</td>
</tr>
</tbody>
</table>

**Description:**
Sets the angle that is added to the commutating angle.

**Caution:**
If the angular correction is not correctly set, when changing over and with closed-loop torque control, the motor can accelerate to high speeds in spite of the fact that a setpoint of zero has been entered.
### PolID diagnostics / PolID diag

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Can be changed</th>
<th>Calculated</th>
<th>Access level</th>
</tr>
</thead>
<tbody>
<tr>
<td>r1992</td>
<td>Displays diagnostics information for the pole position identification routine (PolID).</td>
<td>-</td>
<td>-</td>
<td>3</td>
</tr>
</tbody>
</table>

#### Bit field:

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Critical encoder fault occurred</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>02</td>
<td>Encoder parking active</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>05</td>
<td>Encoder fault Class 1</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>06</td>
<td>Encoder fault Class 2</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>07</td>
<td>Pole position identification for encoder carried out</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>08</td>
<td>Fine synchronization carried out</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>09</td>
<td>Coarse synchronization carried out</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Commutation information available</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Speed information available</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Position information available</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Zero mark passed</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>

#### Dependency:


#### Note:

PolID: Pole position identification

### PolID motion-based current / PolID I mot_bas

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Can be changed</th>
<th>Calculated</th>
<th>Access level</th>
</tr>
</thead>
<tbody>
<tr>
<td>p1993[0...n]</td>
<td>Sets the current when executing the motion-based pole position identification.</td>
<td>U, T</td>
<td>CALC_MOD_EQU</td>
<td>3</td>
</tr>
</tbody>
</table>

#### Dependency:


#### Note:

PolID mot: Motion-based pole position identification

### PolID motion-based rise time / PolID T mot_bas

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Can be changed</th>
<th>Calculated</th>
<th>Access level</th>
</tr>
</thead>
<tbody>
<tr>
<td>p1994[0...n]</td>
<td>Sets the rise time of the current when executing the motion-based pole position identification.</td>
<td>U, T</td>
<td>-</td>
<td>3</td>
</tr>
</tbody>
</table>

#### Dependency:


#### Note:

PolID mot: Motion-based pole position identification
### List of parameters

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**SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>p1995[0...n]</strong></td>
<td>PolID motion-based gain / PolID kp mot_bas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can be changed: U, T</td>
<td>Calculated: CALC_MOD_CON</td>
<td>Access level: 3</td>
<td></td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td>Dynamic index: MDS, p0130</td>
<td>Func. diagram: -</td>
<td></td>
</tr>
<tr>
<td>P-Group: Motor identification</td>
<td>Units group: 17_1</td>
<td>Unit selection: p0505</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
</tr>
<tr>
<td>Min: 0.000 [Nms/rad]</td>
<td>Max: 999999.000 [Nms/rad]</td>
<td>Factory setting: 0.300 [Nms/rad]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>p1996[0...n]</strong></td>
<td>PolID motion-based integral time / PolID Tn mot_bas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can be changed: U, T</td>
<td>Calculated: CALC_MOD_CON</td>
<td>Access level: 3</td>
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<td>Data type: FloatingPoint32</td>
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<td>Func. diagram: -</td>
<td></td>
</tr>
<tr>
<td>P-Group: Motor identification</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
</tr>
<tr>
<td>Min: 0.0 [ms]</td>
<td>Max: 500.0 [ms]</td>
<td>Factory setting: 2.0 [ms]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>p1997[0...n]</strong></td>
<td>PolID motion-based smoothing time / PolID t_sm mot_bas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can be changed: U, T</td>
<td>Calculated: CALC_MOD_CON</td>
<td>Access level: 3</td>
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</tr>
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<td>Dynamic index: MDS, p0130</td>
<td>Func. diagram: -</td>
<td></td>
</tr>
<tr>
<td>P-Group: Motor identification</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
</tr>
<tr>
<td>Min: 0.0 [ms]</td>
<td>Max: 50.0 [ms]</td>
<td>Factory setting: 0.0 [ms]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>p2000</strong></td>
<td>Reference speed reference frequency / n_ref f_ref</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can be changed: T</td>
<td>Calculated: CALC_MOD_ALL</td>
<td>Access level: 2</td>
<td></td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td>Dynamic index: -</td>
<td>Func. diagram: -</td>
<td></td>
</tr>
<tr>
<td>P-Group: Communications</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:**
Sets the gain when executing the motion-based pole position identification.

**Dependency:**

**Note:**
PolID mot: Motion-based pole position identification

**Description:**
Sets the integral time when executing the motion-based pole position identification.

**Dependency:**

**Note:**
The value 0 de-activates the I component.
Once the integral time has been disabled, the motion is increased during the identification (a minimum of 90 ° electrical).
PolID mot: Motion-based pole position identification

**Description:**
Sets the smoothing time when executing the motion-based pole position identification.

**Dependency:**

**Note:**
PolID mot: Motion-based pole position identification

**Description:**
Sets the reference quantity for speed and frequency.
All speeds or frequencies specified as relative value are referred to this reference quantity.
The reference quantity in this parameter corresponds to 100% or 4000 hex or 4000 0000 hex..

**Dependency:**

**Note:**
For the automatic calculation (p0340 = 1, p3900 > 0) an appropriate pre-assignment is only made if the parameter is not inhibited from being overwritten using p0573 = 1.
If a BICO interconnection is established between different physical quantities, then the particular reference quantities are used as internal conversion factor.
Example 1:
The signal of an analog input (e.g. r4055[0]) is connected to a speed setpoint (e.g. p1070[0]). The actual percentage input value is cyclically converted into the absolute speed setpoint using the reference speed (p2000).

Example 2:
The setpoint from PROFIBUS (r2050[1]) is connected to a speed setpoint (e.g. p1070[0]). The actual input value is cyclically converted into a percentage value via the pre-specified scaling 4000 hex. This percentage value is converted to the absolute speed setpoint via reference speed (p2000).

### p2001 Reference voltage / Reference voltage

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Can be changed</th>
<th>Calculated</th>
<th>Access level</th>
<th>P-Group</th>
<th>Units group</th>
<th>Expert list</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sets the reference quantity for voltages. All voltages specified as relative value are referred to this reference quantity. This also applies for direct voltage values (= rms value) like the DC-link voltage. The reference quantity in this parameter corresponds to 100% or 4000 hex or 4000 0000 hex. For the automatic calculation (p0340 = 1, p3900 &gt; 0) an appropriate pre-assignment is only made if the parameter is not inhibited from being overwritten using p0573 = 1. If a BICO interconnection is established between different physical quantities, then the particular reference quantities are used as internal conversion factor. For infeed units, the parameterized device supply voltage (p0210) is pre-assigned as the reference quantity. Example: The actual value of the DC link voltage (r0070) is connected to a test socket (e.g. p0771[0]). The actual voltage value is cyclically converted into a percentage of the reference voltage (p2001) and output according to the parameterized scaling.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>T</td>
<td>CALC_MOD_ALL</td>
<td>3</td>
<td>Communications</td>
<td>-</td>
<td>1</td>
<td>1000 [Vrms]</td>
</tr>
<tr>
<td></td>
<td>Data type: FloatingPoint32</td>
<td></td>
<td>Dynamic index:</td>
<td>-</td>
<td>Func. diagram:</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P-Group: Communications</td>
<td></td>
<td>Units group:</td>
<td>-</td>
<td>Unit selection:</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not for motor type: -</td>
<td></td>
<td>Scaling:</td>
<td>-</td>
<td>Expert list:</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Min</td>
<td>10 [Vrms]</td>
<td>100000 [Vrms]</td>
<td>1000 [Vrms]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### p2002 Reference current / I_ref

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Can be changed</th>
<th>Calculated</th>
<th>Access level</th>
<th>P-Group</th>
<th>Units group</th>
<th>Expert list</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sets the reference quantity for currents. All currents specified as relative value are referred to this reference quantity. The reference quantity in this parameter corresponds to 100% or 4000 hex or 4000 0000 hex. If various DDS are used with different motor data, then the reference quantities remain the same as these are not changed over with the DDS. The resulting conversion factor should be taken into account (e.g. for trace records). Example: p2002 = 100 A Reference quantity 100 A corresponds to 100 % p305[0] = 100 A Rated motor current 100 A for MDS0 in DDS0 --&gt; 100 % corresponds to 100 % of the rated motor current p305[1] = 50 A Rated motor current 50 A for MDS1 in DDS1 --&gt; 100 % corresponds to 200 % of the rated motor current</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>T</td>
<td>CALC_MOD_ALL</td>
<td>3</td>
<td>Communications</td>
<td>-</td>
<td>1</td>
<td>100.00 [Arms]</td>
</tr>
<tr>
<td></td>
<td>Data type: FloatingPoint32</td>
<td></td>
<td>Dynamic index:</td>
<td>-</td>
<td>Func. diagram:</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P-Group: Communications</td>
<td></td>
<td>Units group:</td>
<td>-</td>
<td>Unit selection:</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not for motor type: -</td>
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<td>Scaling:</td>
<td>-</td>
<td>Expert list:</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Min</td>
<td>0.10 [Arms]</td>
<td>100000.00 [Arms]</td>
<td>100.00 [Arms]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Example:
The actual value of a phase current (r0069[0]) is connected to a test socket (e.g. p0771[0]). The actual current value is cyclically converted into a percentage of the reference current (p2002) and output according to the parameterized scaling.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>p2003</td>
<td>Reference torque / M_ref</td>
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</tr>
<tr>
<td></td>
<td>Can be changed: T</td>
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<td></td>
<td>Data type: FloatingPoint32</td>
<td></td>
</tr>
<tr>
<td></td>
<td>P-Group: Communications</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not for motor type: -</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Min 0.01 [Nm]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Max 2000000.00 [Nm]</td>
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</tr>
<tr>
<td></td>
<td>Calculated: CALC_MOD_ALL</td>
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</tr>
<tr>
<td></td>
<td>Access level: 3</td>
<td></td>
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<tr>
<td></td>
<td>Dynamic index: -</td>
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<tr>
<td></td>
<td>Units group: 7_2</td>
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<tr>
<td></td>
<td>Scaling: -</td>
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<tr>
<td></td>
<td>Expert list: 1</td>
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</tr>
<tr>
<td></td>
<td>Factory setting 1.00 [Nm]</td>
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<tr>
<td>p2004</td>
<td>Reference power / P_ref</td>
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<tr>
<td></td>
<td>Can be changed:</td>
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<tr>
<td></td>
<td>Data type: FloatingPoint32</td>
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</tr>
<tr>
<td></td>
<td>P-Group: Communications</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not for motor type: -</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Min - [kW]</td>
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</tr>
<tr>
<td></td>
<td>Max - [kW]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Calculated: -</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Access level: 3</td>
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</tr>
<tr>
<td></td>
<td>Dynamic index: -</td>
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</tr>
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<td></td>
<td>Units group: 14_10</td>
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<td>Scaling: -</td>
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<td></td>
<td>Expert list: 1</td>
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<td></td>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td>p2005</td>
<td>Reference angle / Reference angle</td>
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<td>Can be changed: T</td>
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<tr>
<td></td>
<td>Data type: FloatingPoint32</td>
<td></td>
</tr>
<tr>
<td></td>
<td>P-Group: Communications</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not for motor type: -</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Min 90.00 ['']</td>
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</tr>
<tr>
<td></td>
<td>Calculated: CALC_MOD_ALL</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Access level: 3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dynamic index: -</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Units group: -</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Scaling: -</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Expert list: 1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Factory setting 90.00 ['']</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Recommendation:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Displays the reference quantity for power.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>All power ratings specified as relative value are referred to this reference quantity.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The reference quantity in this parameter corresponds to 100% or 4000 hex or 4000 0000 hex.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dependency:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>This value is calculated as follows:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Infeed: Calculated from voltage times current.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Closed-loop control: Calculated from torque times speed.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Note:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>If a BICO interconnection is established between different physical quantities, then the particular reference quantities are used as internal conversion factor.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The reference power is calculated as follows:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- 2 * Pi * reference speed / 60 * reference torque (motor)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- reference voltage * reference current * root(3) (infeed)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Recommendation:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Displays the reference quantity for angle.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>All angles specified as relative value are referred to this reference quantity.</td>
<td></td>
</tr>
</tbody>
</table>
|           | The reference quantity in this parameter corresponds to 100% or 4000 hex or 4000 0000 hex.
Note: For the automatic calculation (p0340 = 1, p3900 > 0) an appropriate pre-assignment is only made if the parameter is not inhibited from being overwritten using p0573 = 1.
If a BICO interconnection is established between different physical quantities, then the particular reference quantities are used as internal conversion factor.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Reference temp / Ref temp</th>
</tr>
</thead>
<tbody>
<tr>
<td>p2006</td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Can be changed: T Calculated: CALC_MOD_ALL Access level: 3</td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td>Dynamic index: -</td>
</tr>
<tr>
<td>P-Group: Communications</td>
<td>Units group: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
</tr>
<tr>
<td>Min 50.00 [°C]</td>
<td>Max 300.00 [°C]</td>
</tr>
</tbody>
</table>

Description: Sets the reference quantity for temperature.

All temperatures specified as relative value are referred to this reference quantity.
The reference quantity in this parameter corresponds to 100% or 4000 hex or 4000 0000 hex.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Reference acceleration / a_ref</th>
</tr>
</thead>
<tbody>
<tr>
<td>p2007</td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Can be changed: T Calculated: CALC_MOD_ALL Access level: 3</td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td>Dynamic index: -</td>
</tr>
<tr>
<td>P-Group: Communications</td>
<td>Units group: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
</tr>
<tr>
<td>Min 0.01 [rev/s²]</td>
<td>Max 500000.00 [rev/s²]</td>
</tr>
</tbody>
</table>

Description: Sets the reference quantity for acceleration rates.

All acceleration rates specified as relative value are referred to this reference quantity.
The reference quantity in this parameter corresponds to 100% or 4000 hex or 4000 0000 hex.

Note: For the automatic calculation (p0340 = 1, p3900 > 0) an appropriate pre-assignment is only made if the parameter is not inhibited from being overwritten using p0573 = 1. If a BICO interconnection is established between different physical quantities, then the particular reference quantities are used as internal conversion factor.
The reference acceleration is calculated as follows:
Reference speed (p2000) converted from 1/min to 1/s divided by 1 s
--> p2007 = p2000 [rpm] / (60 [s/min] * 1 [s])

<table>
<thead>
<tr>
<th>Parameter</th>
<th>CI: Comm IF USS PZD send word / Comm USS send word</th>
</tr>
</thead>
<tbody>
<tr>
<td>p2016[0...3]</td>
<td></td>
</tr>
<tr>
<td>CU_S110-CAN, CU_S110-DP, CU_S110-PN</td>
<td>Can be changed: U, T Calculated: - Access level: 3</td>
</tr>
<tr>
<td>Data type: Unsigned32 / Integer16</td>
<td>Dynamic index: - Func. diagram: -</td>
</tr>
<tr>
<td>P-Group: Communications</td>
<td>Units group: - Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: 4000H Expert list: 1</td>
</tr>
<tr>
<td>Min -</td>
<td>Max -</td>
</tr>
</tbody>
</table>

Description: Selects the PZD (actual values) to be sent via the commissioning interface USS.
The actual values are displayed on an intelligent operator panel (IOP).

Index:
- [0] = PZD 1
- [1] = PZD 2
- [2] = PZD 3
- [3] = PZD 4
### r2019[0...7] Comm int error statistics / Comm err

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Index</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>r2019[0]</td>
<td>Displays the receive errors at the commissioning interface (RS232).</td>
<td>[0]</td>
<td>Number of error-free telegrams</td>
</tr>
<tr>
<td>r2019[1]</td>
<td></td>
<td>[1]</td>
<td>Number of rejected telegrams</td>
</tr>
<tr>
<td>r2019[2]</td>
<td></td>
<td>[2]</td>
<td>Number of framing errors</td>
</tr>
<tr>
<td>r2019[3]</td>
<td></td>
<td>[3]</td>
<td>Number of overrun errors</td>
</tr>
<tr>
<td>r2019[5]</td>
<td></td>
<td>[5]</td>
<td>Number of starting character errors</td>
</tr>
<tr>
<td>r2019[7]</td>
<td></td>
<td>[7]</td>
<td>Number of length errors</td>
</tr>
</tbody>
</table>

### p2020 Field bus interface baud rate / Field bus baud

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
</table>

### p2021 Field bus interface address / Field bus address

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>p2021</td>
<td>Displays or sets the address for the fieldbus interface USS.</td>
<td>0: Factory setting 31: Factory setting</td>
</tr>
</tbody>
</table>
**Parameter**

**List of parameters**

2) Using p2021

--> Only if an address of 0 or an address which is invalid for the fieldbus selected in p2030 has been set using the address switch.

--> The address is saved in a non-volatile fashion using the function "copy from RAM to ROM".

--> A change only becomes effective after a POWER ON.

**Dependency:**
Refer to: p2030

**Note:**
Changes only become effective after POWER ON.

The parameter is not influenced by setting the factory setting.

The parameter is set to the factory setting when the protocol is reselected.

<table>
<thead>
<tr>
<th>p2022</th>
<th>Field bus int USS PZD no. / Field bus USS PZD</th>
</tr>
</thead>
<tbody>
<tr>
<td>CU_S110-DP</td>
<td>Can be changed: T</td>
</tr>
<tr>
<td>Data type:</td>
<td>Unsigned16</td>
</tr>
<tr>
<td>P-Group:</td>
<td>Communications</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td>0</td>
<td>16</td>
</tr>
</tbody>
</table>

**Description:**
Sets the number of 16-bit words in the PZD part of the USS telegram for the field bus interface.

**Dependency:**
Refer to: p2030

**Note:**
The parameter is not influenced by setting the factory setting.

<table>
<thead>
<tr>
<th>p2023</th>
<th>Field bus int USS PKW no. / Field bus USS PKW</th>
</tr>
</thead>
<tbody>
<tr>
<td>CU_S110-DP</td>
<td>Can be changed: T</td>
</tr>
<tr>
<td>Data type:</td>
<td>Integer16</td>
</tr>
<tr>
<td>P-Group:</td>
<td>Communications</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td>0</td>
<td>127</td>
</tr>
</tbody>
</table>

**Description:**
Sets the number of 16-bit words in the PKW part of the USS telegram for the field bus interface.

**Value:**
0: PKW 0 words
3: PKW 3 words
4: PKW 4 words
127: PKW variable

**Dependency:**
Refer to: p2030

**Note:**
The parameter is not influenced by setting the factory setting.

<table>
<thead>
<tr>
<th>r2029[0...7]</th>
<th>Field bus int error statistics / Field bus error</th>
</tr>
</thead>
<tbody>
<tr>
<td>CU_S110-DP</td>
<td>Can be changed: -</td>
</tr>
<tr>
<td>Data type:</td>
<td>Unsigned32</td>
</tr>
<tr>
<td>P-Group:</td>
<td>Communications</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Description:**
Displays the receive errors on the field bus interface (USS).

**Index:**

[0] = Number of error-free telegrams
[1] = Number of rejected telegrams
[2] = Number of framing errors
[3] = Number of overrun errors
[4] = Number of parity errors
[5] = Number of starting character errors
[6] = Number of checksum errors
[7] = Number of length errors
**p2030**  
**Field bus int protocol selection / Field bus protocol**

**CU_S110-CAN**

- Can be changed: T
- Calculated: -
- Access level: 3

**Data type:** Integer16  
**Dynamic index:** -  
**Func. diagram:** -

**P-Group:** Communications  
**Units group:** -  
**Unit selection:** -

**Not for motor type:** -  
**Scaling:** -  
**Expert list:** 1

**Min**  
**Max**  
**Factory setting**

**Value:**
- 0: No protocol
- 4: CAN

**Note:**
Changes only become effective after POWER ON.
The parameter is not influenced by setting the factory setting.

**p2030**  
**Field bus int protocol selection / Field bus protocol**

**CU_S110-DP**

- Can be changed: T
- Calculated: -
- Access level: 1

**Data type:** Integer16  
**Dynamic index:** -  
**Func. diagram:** -

**P-Group:** Communications  
**Units group:** -  
**Unit selection:** -

**Not for motor type:** -  
**Scaling:** -  
**Expert list:** 1

**Min**  
**Max**  
**Factory setting**

**Value:**
- 0: No protocol
- 1: USS
- 3: PROFIBUS

**Note:**
Changes only become effective after POWER ON.
The parameter is not influenced by setting the factory setting.

**r2032**  
**Master control, control word effective / PcCtrl STW eff**

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

- Can be changed: -
- Calculated: -
- Access level: 2

**Data type:** Unsigned16  
**Dynamic index:** -  
**Func. diagram:** -

**P-Group:** Displays, signals  
**Units group:** -  
**Unit selection:** -

**Not for motor type:** -  
**Scaling:** -  
**Expert list:** 1

**Min**  
**Max**  
**Factory setting**

**Bit field:**

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>ON/OFF1</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>01</td>
<td>OC / OFF2</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>02</td>
<td>OC / OFF3</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>03</td>
<td>Operation enable</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>04</td>
<td>Ramp-function generator enable</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>05</td>
<td>Start ramp-function generator</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>06</td>
<td>Speed setpoint enable</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>07</td>
<td>Acknowledge fault</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>08</td>
<td>Jog bit 0</td>
<td>Yes</td>
<td>No</td>
<td>3030</td>
</tr>
<tr>
<td>09</td>
<td>Jog bit 1</td>
<td>Yes</td>
<td>No</td>
<td>3030</td>
</tr>
<tr>
<td>10</td>
<td>Master ctrl by PLC</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
</tbody>
</table>

**Notice:**
The master control only influences control word 1 and speed setpoint 1. Other control words/setpoints can be transferred from another automation device.

**Note:**
OC: Operating condition
### List of parameters

#### p2035
<table>
<thead>
<tr>
<th>Fieldbus interface USS PIV drive object number / Fieldbus USS DO_no</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CU_S110-CAN, CU_S110-DP, CU_S110-PN</strong></td>
</tr>
<tr>
<td>Can be changed: U, T</td>
</tr>
<tr>
<td>Calculated: -</td>
</tr>
<tr>
<td>Accessed level: 2</td>
</tr>
<tr>
<td>Dynamic index: -</td>
</tr>
<tr>
<td>Func. diagram: -</td>
</tr>
<tr>
<td>P-Group: Communications</td>
</tr>
<tr>
<td>Units group: -</td>
</tr>
<tr>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
</tr>
<tr>
<td>Scaling: -</td>
</tr>
<tr>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
</tr>
<tr>
<td>Max</td>
</tr>
<tr>
<td>Factory setting</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>62</td>
</tr>
<tr>
<td>2</td>
</tr>
</tbody>
</table>

**Description:** Sets the drive object number for communication via the field bus interface (USS).

**Note:**
- p2035 defines the destination for USS parameter requests (PIV).
- p0978[0] defines the destination for USS process data (PZD).
- The parameter is available globally on all drive objects.
- The parameter is not influenced by setting the factory setting.

#### p2037
<table>
<thead>
<tr>
<th>IF1 PROFIdrive STW1.10 = 0 mode / IF1 PD STW1.10=0</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SERVO_S110-DP, SERVO_S110-PN</strong></td>
</tr>
<tr>
<td>Can be changed: T</td>
</tr>
<tr>
<td>Calculated: -</td>
</tr>
<tr>
<td>Access level: 3</td>
</tr>
<tr>
<td>Dynamic index: -</td>
</tr>
<tr>
<td>Func. diagram: -</td>
</tr>
<tr>
<td>P-Group: Communications</td>
</tr>
<tr>
<td>Units group: -</td>
</tr>
<tr>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
</tr>
<tr>
<td>Scaling: -</td>
</tr>
<tr>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
</tr>
<tr>
<td>Max</td>
</tr>
<tr>
<td>Factory setting</td>
</tr>
<tr>
<td>0</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>0</td>
</tr>
</tbody>
</table>

**Description:**
- Sets the processing mode for PROFIdrive STW1.10 "master control by PLC".
- Generally, control world 1 is received with the first receive word (PZD1) (this is in conformance to the PROFIdrive profile). The behavior of STW1.10 = 0 corresponds to that of the PROFIdrive profile. For other applications that deviate from this, the behavior can be adapted using this particular parameter.

**Value:**
- 0: Freeze setpoints and continue to process sign-of-life
- 1: Freeze setpoints and sign-of-life
- 2: Setpoints are not frozen

**Recommend.:**
- Do not change the setting p2037 = 0.

**Note:**
- If the STW1 is not transferred according to the PROFIdrive with PZD1 (with bit 10 "master control by PLC"), then p2037 should be set to 2.

#### p2038
<table>
<thead>
<tr>
<th>IF1 PROFIdrive STW/ZSW interface mode / PD STW/ZSW IF mode</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SERVO_S110-DP, SERVO_S110-PN</strong></td>
</tr>
<tr>
<td>Can be changed: T</td>
</tr>
<tr>
<td>Calculated: -</td>
</tr>
<tr>
<td>Access level: 3</td>
</tr>
<tr>
<td>Dynamic index: -</td>
</tr>
<tr>
<td>Func. diagram: -</td>
</tr>
<tr>
<td>P-Group: Communications</td>
</tr>
<tr>
<td>Units group: -</td>
</tr>
<tr>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
</tr>
<tr>
<td>Scaling: -</td>
</tr>
<tr>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
</tr>
<tr>
<td>Max</td>
</tr>
<tr>
<td>Factory setting</td>
</tr>
<tr>
<td>0</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>0</td>
</tr>
</tbody>
</table>

**Description:**
- Sets the interface mode of the PROFIdrive control words and status words.
- When selecting a telegram via p0922 (p2079), this parameter influences the device-specific assignment of the bits in the control and status words.

**Value:**
- 0: SINAMICS
- 1: SIMODRIVE 611 universal

**Dependency:**
- Refer to: p0922, p2079

**Note:**
- The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

**Note:**
- For p0922 (p2079) = 100 ... 199, p2038 is automatically set to 1 and p2038 can no longer be changed. This means that for these telegrams, the "SIMODRIVE 611 universal" interface mode is set and cannot be changed.
### List of parameters

#### p2038 IF1 PROFIdrive STW/ZSW interface mode / PD STW/ZSW IF mode

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Dependency</th>
<th>Notice</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p2038</td>
<td>Displays the interface mode of the PROFIdrive control words and status words.</td>
<td>0: SINAMICS</td>
<td>Refer to: p0922, p2079</td>
<td>The parameter may be protected as a result of p0922 or p2079 and cannot be changed.</td>
<td>For p0922 (p2079) = 7, 9, 110, 111, p2038 is automatically set to 0 and cannot be changed.</td>
</tr>
</tbody>
</table>

#### p2040 Fieldbus interface monitoring time / Fieldbus t_monit

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Dependency</th>
<th>Notice</th>
</tr>
</thead>
<tbody>
<tr>
<td>p2040</td>
<td>Sets the monitoring time to monitor the process data received via the fieldbus interface. If no process data is received within this time, an appropriate message is output.</td>
<td>Can be changed: U, T</td>
<td>Refer to: F01910</td>
<td>0: The monitoring is de-activated.</td>
</tr>
</tbody>
</table>

#### p2042 PROFIBUS Ident Number / PB Ident No.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Dependency</th>
<th>Notice</th>
</tr>
</thead>
<tbody>
<tr>
<td>p2042</td>
<td>Sets the PROFIBUS Ident Number (PNO-ID). SINAMICS can be operated with various identities on PROFIBUS. This allows the use of a PROFIBUS GSD that is independent of the device (e.g. PROFIdrive VIK-NAMUR with Ident Number 3AA0 hex).</td>
<td>Can be changed: T</td>
<td>Refer to:</td>
<td>Every change only becomes effective after a POWER ON.</td>
</tr>
</tbody>
</table>

#### r2043.0...2 BO: IF1 PROFIdrive PZD state / IF1 PD PZD state

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Dependency</th>
<th>Notice</th>
</tr>
</thead>
<tbody>
<tr>
<td>r2043.0...2</td>
<td>Displays the PROFIdrive PZD state.</td>
<td>Can be changed: -</td>
<td>Refer to: p2044</td>
<td></td>
</tr>
</tbody>
</table>
### List of parameters

#### p2044 IF1 PROFIdrive fault delay / IF1 PD fault delay

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Notice</th>
</tr>
</thead>
<tbody>
<tr>
<td>IF1 PROFIdrive fault delay / IF1 PD fault delay</td>
<td>Sets the delay time to initiate fault F01910 after a setpoint failure. The time until the fault is initiated can be used by the application. This means that is is possible to respond to the failure while the drive is still operational (e.g. emergency retraction).</td>
<td>Refer to: r2043, F01910</td>
<td>The parameter may be protected as a result of p0922 or p2079 and cannot be changed.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
<th>Dynamic index:</th>
<th>Data type:</th>
<th>P-Group:</th>
<th>Units group:</th>
<th>Unit selection:</th>
<th>Expert list:</th>
</tr>
</thead>
<tbody>
<tr>
<td>IF1 PROFIdrive fault delay / IF1 PD fault delay</td>
<td>U, T</td>
<td>-</td>
<td>3</td>
<td>-</td>
<td>FloatingPoint32</td>
<td>Communications</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>IF1 PROFIdrive fault delay / IF1 PD fault delay</td>
<td>0 [s]</td>
<td>100 [s]</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

#### p2045 CI: PROFIdrive clock-cyc. synchr. master sign-of-life, signal source / PD mast-Sol S_src

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Notice</th>
</tr>
</thead>
<tbody>
<tr>
<td>CI: PROFIdrive clock-cyc. synchr. master sign-of-life, signal source / PD mast-Sol S_src</td>
<td>Connector input for the sign-of-life of the clock synchronous PROFIdrive controller. The sign-of-life is expected at bits 12 to 15. Bits 0 to 11 are not evaluated. The sign-of-life signal is normally received in PZD4 (control word 2) from the PROFIdrive controller.</td>
<td>Refer to: p0925, r2065</td>
<td>The parameter may be protected as a result of p0922 or p2079 and cannot be changed.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
<th>Dynamic index:</th>
<th>Data type:</th>
<th>P-Group:</th>
<th>Units group:</th>
<th>Unit selection:</th>
<th>Expert list:</th>
</tr>
</thead>
<tbody>
<tr>
<td>CI: PROFIdrive clock-cyc. synchr. master sign-of-life, signal source / PD mast-Sol S_src</td>
<td>T</td>
<td>-</td>
<td>3</td>
<td>-</td>
<td>Unsigned32 / Integer16</td>
<td>Communications</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>CI: PROFIdrive clock-cyc. synchr. master sign-of-life, signal source / PD mast-Sol S_src</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0</td>
</tr>
</tbody>
</table>

#### p2047 PROFIBUS additional monitoring time / PB suppl t_monit

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Notice</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROFIBUS additional monitoring time / PB suppl t_monit</td>
<td>Sets the additional monitoring time to monitor the process data received via PROFIBUS. The additional monitoring time enables short bus faults to be compensated. If no process data is received within this time, an appropriate message is output. Do not set the additional monitoring time for clock-synchronous operation.</td>
<td>Refer to: F01910</td>
<td>For controller STOP, the additional monitoring time is not effective.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
<th>Dynamic index:</th>
<th>Data type:</th>
<th>P-Group:</th>
<th>Units group:</th>
<th>Unit selection:</th>
<th>Expert list:</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROFIBUS additional monitoring time / PB suppl t_monit</td>
<td>U, T</td>
<td>-</td>
<td>3</td>
<td>-</td>
<td>FloatingPoint32</td>
<td>Communications</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PROFIBUS additional monitoring time / PB suppl t_monit</td>
<td>0 [ms]</td>
<td>20000 [ms]</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0 [ms]</td>
</tr>
</tbody>
</table>

#### p2048 PROFIdrive PZD sampling time / PZD t_sample

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Notice</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROFIdrive PZD sampling time / PZD t_sample</td>
<td>Sets the sampling time for the process data communication (PZD). For clock cycle synchronous operation, the specified bus cycle time applies (Tdp).</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
<th>Dynamic index:</th>
<th>Data type:</th>
<th>P-Group:</th>
<th>Units group:</th>
<th>Unit selection:</th>
<th>Expert list:</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROFIdrive PZD sampling time / PZD t_sample</td>
<td>C1(3)</td>
<td>-</td>
<td>3</td>
<td>-</td>
<td>FloatingPoint32</td>
<td>Communications</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>PROFIdrive PZD sampling time / PZD t_sample</td>
<td>4.00 [ms]</td>
<td>16.00 [ms]</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>4.00 [ms]</td>
</tr>
</tbody>
</table>
### List of Parameters

#### Parameter p2048

**Description:**
Sets the sampling time for the process data communication (PZD).

**Note:**
For clock cycle synchronous operation, the specified bus cycle time applies (Tdp).

**Index:**
- [0] = PZD 1
- [1] = PZD 2
- [2] = PZD 3
- [3] = PZD 4
- [4] = PZD 5

**Dependency:**
Refer to: r2060

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Index</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p2048</td>
<td>PROFIdrive PZD sampling time / PZD t_sample</td>
<td>Can be changed: C1(3)</td>
<td>Calculated: -</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Data type: FloatingPoint32</td>
<td>Dynamic index: -</td>
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<td></td>
<td>P-Group: Communications</td>
<td>Units group: -</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.00 [ms]</td>
<td>16.00 [ms]</td>
</tr>
</tbody>
</table>

#### Parameter r2050[0...4]

**Description:**
Connector output to interconnect PZD (setpoints) with word format received from the PROFIdrive controller.

**Index:**
- [0] = PZD 1
- [1] = PZD 2
- [2] = PZD 3
- [3] = PZD 4
- [4] = PZD 5

**Dependency:**
Refer to: r2060

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Index</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>r2050[0...4]</td>
<td>CO: IF1 PROFIdrive PZD receive word / IF1 PZD recv word</td>
<td>Can be changed: -</td>
<td>Calculated: -</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Data type: Integer16</td>
<td>Dynamic index: -</td>
</tr>
<tr>
<td></td>
<td></td>
<td>P-Group: Communications</td>
<td>Units group: -</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Not for motor type: -</td>
<td>Scaling: 4000H</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

#### Parameter r2050[0...19]

**Description:**
Connector output to interconnect PZD (setpoints) with word format received from the PROFIdrive controller.

**Index:**
- [0] = PZD 1
- [1] = PZD 2
- [2] = PZD 3
- [3] = PZD 4
- [4] = PZD 5
- [5] = PZD 6
- [6] = PZD 7
- [7] = PZD 8
- [8] = PZD 9
- [9] = PZD 10
- [10] = PZD 11
- [12] = PZD 13
- [13] = PZD 14
- [14] = PZD 15
- [15] = PZD 16
- [16] = PZD 17
- [17] = PZD 18
- [18] = PZD 19
- [19] = PZD 20

**Dependency:**
Refer to: r2060
**Notice:** Where there is a multiple interconnection of a connector output, all the connector inputs must either have Integer or FloatingPoint data types.
A BICO interconnection for a single PZD can only take place either on r2050 or r2060.

**Note:** IF1: Interface 1

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description:</th>
<th>Index:</th>
</tr>
</thead>
<tbody>
<tr>
<td>p2051[0...20]</td>
<td>CI: IF1 PROFIdrive PZD send word / IF1 PZD send word</td>
<td>[0] = PZD 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[1] = PZD 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[2] = PZD 3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[3] = PZD 4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[5] = PZD 6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[6] = PZD 7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[7] = PZD 8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[8] = PZD 9</td>
</tr>
<tr>
<td></td>
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<td>[9] = PZD 10</td>
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<td></td>
<td></td>
<td>[10] = PZD 11</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[12] = PZD 13</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[13] = PZD 14</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[14] = PZD 15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[15] = PZD 16</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[16] = PZD 17</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[17] = PZD 18</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[18] = PZD 19</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[19] = PZD 20</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[20] = PZD 21</td>
</tr>
</tbody>
</table>

**Notice:** The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

**Note:** IF1: Interface 1

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description:</th>
<th>Index:</th>
</tr>
</thead>
<tbody>
<tr>
<td>p2051[0...27]</td>
<td>CI: IF1 PROFIdrive PZD send word / IF1 PZD send word</td>
<td>[0] = PZD 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[1] = PZD 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[2] = PZD 3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[3] = PZD 4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[5] = PZD 6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[6] = PZD 7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[7] = PZD 8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[8] = PZD 9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[9] = PZD 10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[10] = PZD 11</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[12] = PZD 13</td>
</tr>
</tbody>
</table>
List of parameters

Parameter

 Dependency:
Refer to: p2061

 Notice:
The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

 Note:
IF1: Interface 1

**r2053[0...20]**  IF1 PROFIdrive diagnostics PZD send word / IF1 diag send word

| CU_S110-CAN, | Can changed: - | Calculated: - | Access level: 3 |
| CU_S110-DP, | Data type: Unsigned16 | Dynamic index: - | Func. diagram: - |
| CU_S110-PN | P-Group: Communications | Units group: - | Unit selection: - |

 Notice:
The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

 Note:
IF1: Interface 1

**Description:**
Displays the PZD (actual values) with word format sent to the PROFIdrive controller.

**Index:**
0 = PZD 1
1 = PZD 2
2 = PZD 3
3 = PZD 4
4 = PZD 5
5 = PZD 6
6 = PZD 7
7 = PZD 8
8 = PZD 9
9 = PZD 10
10 = PZD 11
11 = PZD 12
12 = PZD 13
13 = PZD 14
14 = PZD 15
15 = PZD 16
16 = PZD 17
17 = PZD 18
18 = PZD 19
19 = PZD 20
20 = PZD 21

**Bit field:**

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Bit 0</td>
<td>ON</td>
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<td>-</td>
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<td>02</td>
<td>Bit 2</td>
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<tr>
<td>03</td>
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<td>05</td>
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<td>06</td>
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<td>09</td>
<td>Bit 9</td>
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</tr>
<tr>
<td>10</td>
<td>Bit 10</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
</tbody>
</table>
### Description:
Displays the PZD (actual values) with word format sent to the PROFINET controller.

### Index:
- Can be changed: -
- Calculated: -
- Access level: 3

### SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

### Data type:
- Unsigned16

### Dynamic index:
- -

### Unit selection:
- -

### Not for motor type:
- -

### Scaling:
- -

### Expert list:
- 1

### Min
- -

### Max
- -

### Factory setting
- -

### Bit field:

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Bit 0</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>01</td>
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<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>04</td>
<td>Bit 4</td>
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</tr>
<tr>
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</tr>
<tr>
<td>07</td>
<td>Bit 7</td>
<td>ON</td>
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<td>-</td>
</tr>
<tr>
<td>08</td>
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<td>OFF</td>
<td>-</td>
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<td>-</td>
</tr>
<tr>
<td>15</td>
<td>Bit 15</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
</tbody>
</table>
**Dependency:** Refer to: p2051, p2061

**Note:** IF1: Interface 1

### r2054
**PROFIBUS status / PB status**

<table>
<thead>
<tr>
<th>CU_S110-DP</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level: 3</th>
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</thead>
<tbody>
<tr>
<td><strong>Data type:</strong> Integer16</td>
<td><strong>Dynamic index:</strong></td>
<td><strong>Unit selection:</strong> -</td>
<td><strong>Func. diagram:</strong> 2410</td>
</tr>
<tr>
<td><strong>P-Group:</strong> Communications</td>
<td><strong>Units group:</strong> -</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Not for motor type:</strong> -</td>
<td><strong>Scaling:</strong> -</td>
<td><strong>Expert list:</strong> 1</td>
<td></td>
</tr>
<tr>
<td><strong>Min</strong></td>
<td><strong>Max</strong></td>
<td><strong>Factory setting</strong></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Status display for the PROFIBUS interface.

**Value:**
- 0: OFF
- 1: No connection (search for baud rate)
- 2: Connection OK (baud rate found)
- 3: Cyclic connection with master (data exchange)
- 4: Cyclic data OK

**Note:**
- Re r2054 = 3:
  - In state 3 (the LED flashes green), a cyclic connection has been established to the PROFIBUS master; however, one of the following prerequisites is missing for cyclic operation:
    - No setpoints are being received as the PROFIBUS master is in the STOP condition.
    - Only for clock-cycle synchronous operation, the following applies:
      - The drive is not in synchronism as the global control (GC) has an error.
  - Re r2054 = 4:
  - In the status 4 (LED green), the cyclic connection to the PROFIBUS master has been established and setpoints are being received. The clock cycle synchronization is OK, the global control (GC) is error-free.

This state does not provide any statement regarding the quality of the clock cycle synchronous sign-of-life characters on the drive objects.

### r2055[0...2]
**PROFIBUS diagnostics standard / PB diag standard**

<table>
<thead>
<tr>
<th>CU_S110-DP</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level: 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Data type:</strong> Unsigned16</td>
<td><strong>Dynamic index:</strong></td>
<td><strong>Unit selection:</strong> -</td>
<td><strong>Func. diagram:</strong> 2410</td>
</tr>
<tr>
<td><strong>P-Group:</strong> Communications</td>
<td><strong>Units group:</strong> -</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Not for motor type:</strong> -</td>
<td><strong>Scaling:</strong> -</td>
<td><strong>Expert list:</strong> 1</td>
<td></td>
</tr>
<tr>
<td><strong>Min</strong></td>
<td><strong>Max</strong></td>
<td><strong>Factory setting</strong></td>
<td></td>
</tr>
<tr>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Diagnostics display for the PROFIBUS interface.

**Index:**
- [0] = Master bus address
- [1] = Master input total length bytes
- [2] = Master output total length bytes

### r2057
**PROFIBUS address switch diagnostics / PB addr diagn**

<table>
<thead>
<tr>
<th>CU_S110-DP</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level: 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Data type:</strong> Unsigned16</td>
<td><strong>Dynamic index:</strong></td>
<td><strong>Unit selection:</strong> -</td>
<td><strong>Func. diagram:</strong> 2410</td>
</tr>
<tr>
<td><strong>P-Group:</strong> Communications</td>
<td><strong>Units group:</strong> -</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Not for motor type:</strong> -</td>
<td><strong>Scaling:</strong> -</td>
<td><strong>Expert list:</strong> 1</td>
<td></td>
</tr>
<tr>
<td><strong>Min</strong></td>
<td><strong>Max</strong></td>
<td><strong>Factory setting</strong></td>
<td></td>
</tr>
<tr>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Displays the setting of the PROFIBUS address switch "DP ADDRESS" on the Control Unit.

**Dependency:** Refer to: p0918
Parameter

List of parameters

---

r2060[0...18]  CO: IF1 PROFlDrive PZD receive double word / IF1 PZD recv DW

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

- **Can be changed:** -
- **Calculated:** -
- **Access level:** 3
- **Data type:** Integer32
- **Dynamic index:** -
- **Func. diagram:** 2440, 2468
- **P-Group:** Communications
- **Units group:** -
- **Unit selection:** -
- **Not for motor type:** -
- **Scaling:** 4000H
- **Expert list:** 1
- **Min**
- **Max**
- **Factory setting**

**Description:**
Connector output to interconnect PZD (setpoints) with double word format received from the PROFlDrive controller.

**Index:**
- [0] = PZD 1 + 2
- [1] = PZD 2 + 3
- [2] = PZD 3 + 4
- [3] = PZD 4 + 5
- [4] = PZD 5 + 6
- [5] = PZD 6 + 7
- [6] = PZD 7 + 8
- [7] = PZD 8 + 9
- [8] = PZD 9 + 10
- [9] = PZD 10 + 11
- [10] = PZD 11 + 12
- [12] = PZD 13 + 14
- [13] = PZD 14 + 15
- [14] = PZD 15 + 16
- [15] = PZD 16 + 17
- [16] = PZD 17 + 18
- [17] = PZD 18 + 19
- [18] = PZD 19 + 20

**Dependency:**
Refer to: r2050

**Notice:**
Where there is a multiple interconnection of a connector output, all the connector inputs must either have Integer or FloatingPoint data types.

A BICO interconnection for a single PZD can only take place either on r2050 or r2060.

A maximum of 4 indices of the "trace" function can be used.

**Note:**
IF1: Interface 1

---

p2061[0...26]  CI: IF1 PROFlDrive PZD send double word / IF1 PZD send DW

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

- **Can be changed:** U, T
- **Calculated:** -
- **Access level:** 3
- **Data type:** Unsigned32 / Integer32
- **Dynamic index:** -
- **Func. diagram:** 2470
- **P-Group:** Communications
- **Units group:** -
- **Unit selection:** -
- **Not for motor type:** -
- **Scaling:** 4000H
- **Expert list:** 1
- **Min**
- **Max**
- **Factory setting**

**Description:**
Selects the PZD (actual values) with double word format to be sent to the PROFlDrive controller.

**Index:**
- [0] = PZD 1 + 2
- [1] = PZD 2 + 3
- [2] = PZD 3 + 4
- [3] = PZD 4 + 5
- [4] = PZD 5 + 6
- [5] = PZD 6 + 7
- [6] = PZD 7 + 8
- [7] = PZD 8 + 9
- [8] = PZD 9 + 10
- [9] = PZD 10 + 11
- [10] = PZD 11 + 12
- [12] = PZD 13 + 14
- [13] = PZD 14 + 15
- [14] = PZD 15 + 16
List of parameters

Parameter

[15] = PZD 16 + 17
[16] = PZD 17 + 18
[17] = PZD 18 + 19
[18] = PZD 19 + 20
[19] = PZD 20 + 21
[20] = PZD 21 + 22
[21] = PZD 22 + 23
[22] = PZD 23 + 24
[23] = PZD 24 + 25
[24] = PZD 25 + 26
[25] = PZD 26 + 27
[26] = PZD 27 + 28

Dependency:
Refer to: p2051

Notice:
A BICO interconnection for a single PZD can only take place either on r2051 or r2061.
The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

Note:
IF1: Interface 1

[r2063[0...26]] IF1 PROFIdrive diagnostics PZD send double word / IF1 diag send DW

SERVO_S110-CAN,
SERVO_S110-DP,
SERVO_S110-PN

Can be changed: -
Calculated: -
Access level: 3

Data type: Unsigned32
Dynamic index: -
Func. diagram: 2450, 2470

P-Group: Communications
Units group: -
Unit selection: -

Not for motor type: -
Scaling: -
Expert list: 1

Min -
Max -
Factory setting -

Description:
Displays the PZD (actual values) with double word format sent to the PROFIdrive controller.

Index:
[0] = PZD 1 + 2
[1] = PZD 2 + 3
[2] = PZD 3 + 4
[3] = PZD 4 + 5
[4] = PZD 5 + 6
[5] = PZD 6 + 7
[6] = PZD 7 + 8
[7] = PZD 8 + 9
[8] = PZD 9 + 10
[9] = PZD 10 + 11
[10] = PZD 11 + 12
[12] = PZD 13 + 14
[13] = PZD 14 + 15
[14] = PZD 15 + 16
[15] = PZD 16 + 17
[16] = PZD 17 + 18
[17] = PZD 18 + 19
[18] = PZD 19 + 20
[19] = PZD 20 + 21
[20] = PZD 21 + 22
[21] = PZD 22 + 23
[22] = PZD 23 + 24
[23] = PZD 24 + 25
[24] = PZD 25 + 26
[25] = PZD 26 + 27
[26] = PZD 27 + 28

Bit field: Bit Signal name 1 signal 0 signal FP
00 Bit 0 ON OFF -
01 Bit 1 ON OFF -
02 Bit 2 ON OFF -
03 Bit 3 ON OFF -
04 Bit 4 ON OFF -
05 Bit 5 ON OFF -
06 Bit 6 ON OFF -
List of parameters

Notice: A maximum of 4 indices of the "trace" function can be used.

Note: IF1: Interface 1

<p>| | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
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Parameter

r2064[0...7] PROFIdrive diagnostics clock synchronous mode / PD diag clock sync

CU_S110-DP, CU_S110-PN

Can be changed: - Calculated: - Access level: 3
Data type: Integer32 Dynamic index: - Func. diagram: 2410
P-Group: Communications Units group: -
Not for motor type: - Scaling: - Expert list: 1
Min - Max Factory setting

Description: Displays the last parameter received from the PROFIdrive controller for clock synchronism. The parameters for clock synchronism are created when configuring the bus and are transferred at the start of cyclic operation from the controller to the device.

Index:
[0] = Clock synchronous mode activated
[1] = Bus cycle time (Tdp) [µs]
[2] = Master cycle time (Tmapc) [µs]
[3] = Instant of actual value acquisition (Ti) [µs]
[4] = Instant of setpoint acquisition (To) [µs]
[5] = Data exchange interval (Tdx) [µs]
[6] = PLL window (Tpll-w) [1/12 µs]
[7] = PLL delay time (Tpll-d) [1/12 µs]

r2065 PROFIdrive controller sign-of-life, diagnostics / PD ctrl SoL diag

CU_S110-DP, CU_S110-PN, SERVO_S110-DP, SERVO_S110-PN

Can be changed: - Calculated: - Access level: 3
Data type: Unsigned16 Dynamic index: - Func. diagram: 2410
P-Group: Communications Units group: -
Not for motor type: - Scaling: - Expert list: 1
Min - Max Factory setting

Description: Displays how often the sign-of-life from the clock synchronous PROFIdrive controller has failed. An appropriate fault is output when the tolerance, specified in p0925, is exceeded.

Dependency: Refer to: F01912
### List of parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Index</th>
<th>Note</th>
<th>Value range</th>
</tr>
</thead>
<tbody>
<tr>
<td>r2074[0...4]</td>
<td>IF1 PROFIdrive diagnostics bus address PZD receive / IF1diag addr recv</td>
<td>Can be changed: -</td>
<td>IF1: Interface 1</td>
<td>Displays the PROFIBUS address of the sender from which the process data (PZD) is received.</td>
</tr>
<tr>
<td></td>
<td>Data type: Unsigned16</td>
<td>Dynamic index: -</td>
<td></td>
<td>[0] = PZD 1</td>
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<tr>
<td></td>
<td>P-Group: Communications</td>
<td>Units group: -</td>
<td></td>
<td>[1] = PZD 2</td>
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<td></td>
<td>Min</td>
<td>Max</td>
<td></td>
<td>[3] = PZD 4</td>
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</tr>
<tr>
<td>r2074[0...19]</td>
<td>IF1 PROFIdrive diagnostics bus address PZD receive / IF1diag addr recv</td>
<td>Can be changed: -</td>
<td>IF1: Interface 1</td>
<td>Displays the PROFIBUS address of the sender from which the process data (PZD) is received.</td>
</tr>
<tr>
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<td>Data type: Unsigned16</td>
<td>Dynamic index: -</td>
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<td>[1] = PZD 2</td>
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<td>[3] = PZD 4</td>
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**Parameter**

**List of parameters**

<table>
<thead>
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<th>Parameter</th>
<th>Description</th>
<th>Index</th>
<th>Note</th>
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<tbody>
<tr>
<td>r2075[0...4]</td>
<td>IF1 PROFIdrive diagnostics telegram offset PZD receive / IF1 diag offs recv</td>
<td>Can be changed: -</td>
<td>IF1: Interface 1</td>
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<tr>
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<td>Calculated: -</td>
<td>Value range: 0 - 242: Byte offset 65535: not assigned</td>
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<tr>
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<td>Access level: 3</td>
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<td>Data type: Unsigned16</td>
<td>Dynamic index: -</td>
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<td>P-Group: Communications</td>
<td>Units group: -</td>
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<td></td>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
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<tr>
<td></td>
<td>Min</td>
<td>Max</td>
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<td></td>
<td>Factory setting</td>
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<table>
<thead>
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<th>Parameter</th>
<th>Description</th>
<th>Index</th>
<th>Note</th>
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</thead>
<tbody>
<tr>
<td>r2075[0...19]</td>
<td>IF1 PROFIdrive diagnostics telegram offset PZD receive / IF1 diag offs recv</td>
<td>Can be changed: -</td>
<td>IF1: Interface 1</td>
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<tr>
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<td>Calculated: -</td>
<td>Value range: 0 - 242: Byte offset 65535: not assigned</td>
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<td>Data type: Unsigned16</td>
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<td>P-Group: Communications</td>
<td>Units group: -</td>
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<td></td>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
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<td></td>
<td>Min</td>
<td>Max</td>
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<td>Factory setting</td>
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</tbody>
</table>
### `r2076[0...20]` IF1 PROFiDrive diagnostics telegram offset PZD send / IF1 diag offs send

**CU_S110-DP, CU_S110-PN**

<table>
<thead>
<tr>
<th>Description:</th>
<th>Displays the PZD byte offset in the PROFiDrive send telegram (controller input).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Index:</td>
<td>0 = PZD 1&lt;br&gt;1 = PZD 2&lt;br&gt;2 = PZD 3&lt;br&gt;3 = PZD 4&lt;br&gt;4 = PZD 5&lt;br&gt;5 = PZD 6&lt;br&gt;6 = PZD 7&lt;br&gt;7 = PZD 8&lt;br&gt;8 = PZD 9&lt;br&gt;9 = PZD 10&lt;br&gt;10 = PZD 11&lt;br&gt;11 = PZD 12&lt;br&gt;12 = PZD 13&lt;br&gt;13 = PZD 14&lt;br&gt;14 = PZD 15&lt;br&gt;15 = PZD 16&lt;br&gt;16 = PZD 17&lt;br&gt;17 = PZD 18&lt;br&gt;18 = PZD 19&lt;br&gt;19 = PZD 20&lt;br&gt;20 = PZD 21</td>
</tr>
<tr>
<td>Note:</td>
<td>IF1: Interface 1&lt;br&gt;Value range: 0 - 242: Byte offset 65535: not assigned</td>
</tr>
</tbody>
</table>

**Data type:** Unsized16  
**P-Group:** Communications  
**Not for motor type:** -  
**Min:** -  
**Max:** -  
**Expert list:** 1  
**Access level:** 3  
**Functionality:** -  

### `r2076[0...27]` IF1 PROFiDrive diagnostics telegram offset PZD send / IF1 diag offs send

**SERVO_S110-DP, SERVO_S110-PN**

<table>
<thead>
<tr>
<th>Description:</th>
<th>Displays the PZD byte offset in the PROFiDrive send telegram (controller input).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Index:</td>
<td>0 = PZD 1&lt;br&gt;1 = PZD 2&lt;br&gt;2 = PZD 3&lt;br&gt;3 = PZD 4&lt;br&gt;4 = PZD 5&lt;br&gt;5 = PZD 6&lt;br&gt;6 = PZD 7&lt;br&gt;7 = PZD 8&lt;br&gt;8 = PZD 9&lt;br&gt;9 = PZD 10&lt;br&gt;10 = PZD 11&lt;br&gt;11 = PZD 12&lt;br&gt;12 = PZD 13&lt;br&gt;13 = PZD 14&lt;br&gt;14 = PZD 15&lt;br&gt;15 = PZD 16&lt;br&gt;16 = PZD 17&lt;br&gt;17 = PZD 18&lt;br&gt;18 = PZD 19&lt;br&gt;19 = PZD 20&lt;br&gt;20 = PZD 21&lt;br&gt;21 = PZD 22&lt;br&gt;22 = PZD 23&lt;br&gt;23 = PZD 24&lt;br&gt;24 = PZD 25&lt;br&gt;25 = PZD 26&lt;br&gt;26 = PZD 27</td>
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**Data type:** Unsized16  
**P-Group:** Communications  
**Not for motor type:** -  
**Min:** -  
**Max:** -  
**Expert list:** 1  
**Access level:** 3  
**Functionality:** -  

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SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3  
1-303
**Parameter**

**List of parameters**

[16] = PZD 17  
[17] = PZD 18  
[18] = PZD 19  
[19] = PZD 20  
[20] = PZD 21  
[21] = PZD 22  
[22] = PZD 23  
[23] = PZD 24  
[24] = PZD 25  
[25] = PZD 26  
[26] = PZD 27  
[27] = PZD 28

**Note:**  
IF1: Interface 1  
Value range:  
0 - 242: Byte offset  
65535: not assigned

**r2077[0...15]**  
**PROFIBUS diagnostics peer-to-peer data transfer addresses / PB diag peer addr**

**Value:**  
-  
Calculations: -  
Access level: 3  
Data type: Unsigned8  
Dynamic index: -  
Unit selection: -

**P-Group:** -  
**Units group:** -  
**Unit selection:** -  
**Scalings:** -  
**P-Group:** -  
**Units group:** -  
**Unit selection:** -  
**Scalings:** -

**Description:**  
Displays the addresses of the slaves (peers) where peer-to-peer data transfer has been configured via PROFIBUS.

**p2079**  
**IF1 PROFIdrive PZD telegram selection extended / IF1 PD PZD tel ext**

**Value:**  
390: SIEMENS telegram 390, PZD-2/2  
391: SIEMENS telegram 391, PZD-3/7  
392: SIEMENS telegram 392, PZD-3/15  
393: SIEMENS telegram 393, PZD-4/21  
394: SIEMENS telegram 394, PZD-3/3  
999: Free telegram configuration with BICO  

**Description:**  
Sets the send and receive telegram.  
Contrary to p0922, a telegram can be selected using p2079 and subsequently expanded.  
For p0922 < 999 the following applies:  
p2079 has the same value and is inhibited. All of the interconnections and extensions contained in the telegram are inhibited.  
For p0922 = 999 the following applies:  
p2079 can be freely set. If p2079 is also set to 999, then all of the interconnections can be set.  
For p0922 = 999 and p2079 < 999 the following applies:  
The interconnections contained in the telegram are inhibited. However, the telegram can be extended.
### p2079 IF1 PROFIdrive PZD telegram selection extended / IF1 PD PZD tel ext

| Description: | Sets the send and receive telegram. Contrary to p0922, a telegram can be selected using p2079 and subsequently expanded. For p0922 < 999 the following applies: p2079 has the same value and is inhibited. All of the interconnections and extensions contained in the telegram are inhibited. For p0922 = 999 the following applies: p2079 can be freely set. If p2079 is also set to 999, then all of the interconnections can be set. For p0922 = 999 and p2079 < 999 the following applies: The interconnections contained in the telegram are inhibited. However, the telegram can be extended. Value: | 1: Standard telegram 1, PZD-2/2 2: Standard telegram 2, PZD-4/4 3: Standard telegram 3, PZD-5/9 4: Standard telegram 4, PZD-6/14 102: SIEMENS telegram 102, PZD-6/10 103: SIEMENS telegram 103, PZD-7/15 999: Free telegram configuration with BICO Dependency: Refer to: p0922 |

| SERVO_S110-DP, SERVO_S110-PN |
| Can be changed: T Calculated: - Access level: 3 Data type: Integer16 Dynamic index: - Func. diagram: - P-Group: Communications Units group: - Unit selection: - Not for motor type: - Scaling: - Expert list: 1 Min Max Factory setting |

1 999 999 |

#### p2079 IF1 PROFIdrive PZD telegram selection extended / IF1 PD PZD tel ext

| Description: | Sets the send and receive telegram. Contrary to p0922, a telegram can be selected using p2079 and subsequently expanded. For p0922 < 999 the following applies: p2079 has the same value and is inhibited. All of the interconnections and extensions contained in the telegram are inhibited. For p0922 = 999 the following applies: p2079 can be freely set. If p2079 is also set to 999, then all of the interconnections can be set. For p0922 = 999 and p2079 < 999 the following applies: The interconnections contained in the telegram are inhibited. However, the telegram can be extended. Value: | 7: Standard telegram 7, PZD-2/2 9: Standard telegram 9, PZD-10/5 110: SIEMENS telegram 110, PZD-12/7 111: SIEMENS telegram 111, PZD-12/12 999: Free telegram configuration with BICO Dependency: Refer to: p0922 |

| SERVO_S110-DP (EPOS, Pos ctrl), SERVO_S110-PN (EPOS, Pos ctrl) |
| Can be changed: T Calculated: - Access level: 3 Data type: Integer16 Dynamic index: - Func. diagram: - P-Group: Communications Units group: - Unit selection: - Not for motor type: - Scaling: - Expert list: 1 Min Max Factory setting |

7 999 999 |
**Parameter**

**List of parameters**

**p2079**

<table>
<thead>
<tr>
<th>Description:</th>
<th>IF1 PROFIdrive PZD telegram selection extended / IF1 PD PZD tel ext</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-DP (Pos ctrl), SERVO_S110-PN (Pos ctrl)</td>
<td>Can be changed: T Calculated: - Access level: 3</td>
</tr>
<tr>
<td>Data type: Integer16</td>
<td>Dynamic index: - Func. diagram: -</td>
</tr>
<tr>
<td>P-Group: Communications</td>
<td>Units group: - Unit selection: -</td>
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<tr>
<td>Not for motor type: -</td>
<td>Scaling: - Expert list: 1</td>
</tr>
<tr>
<td>Min 999</td>
<td>Max 999 Factory setting 999</td>
</tr>
</tbody>
</table>

**Value:**

999: Free telegram configuration with BICO

**Dependency:**

Refer to: p0922

**Notice:**

The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

---

**p2080[0...15]**

<table>
<thead>
<tr>
<th>Description:</th>
<th>BL: Binector-connector converter status word 1 / Bin/con ZSW1</th>
</tr>
</thead>
<tbody>
<tr>
<td>All objects</td>
<td>Can be changed: U, T Calculated: - Access level: 3</td>
</tr>
<tr>
<td>Data type: Unsigned32 / Binary</td>
<td>Dynamic index: - Func. diagram: 2472</td>
</tr>
<tr>
<td>P-Group: Communications</td>
<td>Units group: - Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: - Expert list: 1</td>
</tr>
<tr>
<td>Min -</td>
<td>Max - Factory setting 0</td>
</tr>
</tbody>
</table>

**Index:**

[0] = Bit 0
[1] = Bit 1
[2] = Bit 2
[3] = Bit 3
[4] = Bit 4
[5] = Bit 5
[6] = Bit 6
[7] = Bit 7
[8] = Bit 8
[9] = Bit 9
[10] = Bit 10
[12] = Bit 12
[13] = Bit 13
[14] = Bit 14
[15] = Bit 15

**Dependency:**

Refer to: p2088, r2089

**Notice:**

The parameter may be protected as a result of p0922 or p2079 and cannot be changed.
**p2081[0...15]**  
**BI: Binector-connector converter status word 2 / Bin/con ZSW2**

<table>
<thead>
<tr>
<th>All objects</th>
<th>Can be changed: U, T</th>
<th>Calculated: -</th>
<th>Access level: 3</th>
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</thead>
<tbody>
<tr>
<td>Data type:</td>
<td>Unsigned32 / Binary</td>
<td>Dynamic index: -</td>
<td>Func. diagram: 2472</td>
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<tr>
<td>P-Group:</td>
<td>Communications</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Selects bits to be sent to the PROFIdrive controller.  
The individual bits are combined to form status word 2.

**Index:**
- [0] = Bit 0  
- [1] = Bit 1  
- [2] = Bit 2  
- [3] = Bit 3  
- [4] = Bit 4  
- [5] = Bit 5  
- [6] = Bit 6  
- [7] = Bit 7  
- [8] = Bit 8  
- [9] = Bit 9  
- [10] = Bit 10  
- [12] = Bit 12  
- [13] = Bit 13  
- [14] = Bit 14  
- [15] = Bit 15

**Dependency:** Refer to: p2088, r2089

**Notice:** The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

**Note:** For clock synchronous operation, bit 12 to 15 to transfer the sign-of-life are reserved in status word 2 - and may not be freely interconnected.

---

**p2082[0...15]**  
**BI: Binector-connector converter status word 3 / Bin/con ZSW3**

<table>
<thead>
<tr>
<th>All objects</th>
<th>Can be changed: U, T</th>
<th>Calculated: -</th>
<th>Access level: 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type:</td>
<td>Unsigned32 / Binary</td>
<td>Dynamic index: -</td>
<td>Func. diagram: 2472</td>
</tr>
<tr>
<td>P-Group:</td>
<td>Communications</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Selects bits to be sent to the PROFIdrive controller.  
The individual bits are combined to form free status word 3.

**Index:**
- [0] = Bit 0  
- [1] = Bit 1  
- [2] = Bit 2  
- [3] = Bit 3  
- [4] = Bit 4  
- [5] = Bit 5  
- [6] = Bit 6  
- [7] = Bit 7  
- [8] = Bit 8  
- [9] = Bit 9  
- [10] = Bit 10  
- [12] = Bit 12  
- [13] = Bit 13  
- [14] = Bit 14  
- [15] = Bit 15

**Dependency:** Refer to: p2088, r2089

**Notice:** The parameter may be protected as a result of p0922 or p2079 and cannot be changed.
### Parameter List

**p2083[0...15]**  
**BI: Binector-connector converter status word 4 / Bin/con ZSW4**

- **All objects**: Can be changed: U, T  
  Calculated: -  
  Access level: 3
- **Data type**: Unsigned32 / Binary  
  Dynamic index: -  
  Func. diagram: 2472
- **P-Group**: Communications  
  Units group: -  
  Unit selection: -
- **Not for motor type**: -  
  Min: -  
  Scaling: -  
  Max: -  
  Expert list: 1
- **Factory setting**: 0

**Description:**
Selects bits to be sent to the PROFIdrive controller.  
The individual bits are combined to form free status word 4.

**Index:**
- [0] = Bit 0
- [1] = Bit 1
- [2] = Bit 2
- [3] = Bit 3
- [4] = Bit 4
- [5] = Bit 5
- [6] = Bit 6
- [7] = Bit 7
- [8] = Bit 8
- [9] = Bit 9
- [10] = Bit 10
- [12] = Bit 12
- [13] = Bit 13
- [14] = Bit 14
- [15] = Bit 15

**Dependency:**
Refer to: p2088, r2089

---

### Parameter List

**p2084[0...15]**  
**BI: Binector-connector converter status word 5 / Bin/con ZSW5**

- **All objects**: Can be changed: U, T  
  Calculated: -  
  Access level: 3
- **Data type**: Unsigned32 / Binary  
  Dynamic index: -  
  Func. diagram: 2472
- **P-Group**: Communications  
  Units group: -  
  Unit selection: -
- **Not for motor type**: -  
  Min: -  
  Scaling: -  
  Max: -  
  Expert list: 1
- **Factory setting**: 0

**Description:**
Selects bits to be sent to the PROFIdrive controller.  
The individual bits are combined to form free status word 5.

**Index:**
- [0] = Bit 0
- [1] = Bit 1
- [2] = Bit 2
- [3] = Bit 3
- [4] = Bit 4
- [5] = Bit 5
- [6] = Bit 6
- [7] = Bit 7
- [8] = Bit 8
- [9] = Bit 9
- [10] = Bit 10
- [12] = Bit 12
- [13] = Bit 13
- [14] = Bit 14
- [15] = Bit 15

**Dependency:**
Refer to: p2088, r2089
**p2088[0...4]**  
Invert binector-connector converter status word / Bin/con ZSW inv

**Description:** Setting to invert the individual binector inputs of the binector connector converter.

**Index:**
- \([0]\) = Status word 1
- \([1]\) = Status word 2
- \([2]\) = Free status word 3
- \([3]\) = Free status word 4
- \([4]\) = Free status word 5

**Dependency:** Refer to: p2080, p2081, p2082, p2083, r2089

**Bit field:**

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Bit 0</td>
<td>Inverted</td>
<td>Not inverted</td>
<td>-</td>
</tr>
<tr>
<td>01</td>
<td>Bit 1</td>
<td>Inverted</td>
<td>Not inverted</td>
<td>-</td>
</tr>
<tr>
<td>02</td>
<td>Bit 2</td>
<td>Inverted</td>
<td>Not inverted</td>
<td>-</td>
</tr>
<tr>
<td>03</td>
<td>Bit 3</td>
<td>Inverted</td>
<td>Not inverted</td>
<td>-</td>
</tr>
<tr>
<td>04</td>
<td>Bit 4</td>
<td>Inverted</td>
<td>Not inverted</td>
<td>-</td>
</tr>
<tr>
<td>05</td>
<td>Bit 5</td>
<td>Inverted</td>
<td>Not inverted</td>
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<tr>
<td>06</td>
<td>Bit 6</td>
<td>Inverted</td>
<td>Not inverted</td>
<td>-</td>
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<tr>
<td>07</td>
<td>Bit 7</td>
<td>Inverted</td>
<td>Not inverted</td>
<td>-</td>
</tr>
<tr>
<td>08</td>
<td>Bit 8</td>
<td>Inverted</td>
<td>Not inverted</td>
<td>-</td>
</tr>
<tr>
<td>09</td>
<td>Bit 9</td>
<td>Inverted</td>
<td>Not inverted</td>
<td>-</td>
</tr>
<tr>
<td>10</td>
<td>Bit 10</td>
<td>Inverted</td>
<td>Not inverted</td>
<td>-</td>
</tr>
<tr>
<td>11</td>
<td>Bit 11</td>
<td>Inverted</td>
<td>Not inverted</td>
<td>-</td>
</tr>
<tr>
<td>12</td>
<td>Bit 12</td>
<td>Inverted</td>
<td>Not inverted</td>
<td>-</td>
</tr>
<tr>
<td>13</td>
<td>Bit 13</td>
<td>Inverted</td>
<td>Not inverted</td>
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<tr>
<td>14</td>
<td>Bit 14</td>
<td>Inverted</td>
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</tr>
<tr>
<td>15</td>
<td>Bit 15</td>
<td>Inverted</td>
<td>Not inverted</td>
<td>-</td>
</tr>
</tbody>
</table>

**r2089[0...4]**  
CO: Send binector-connector converter status word / Bin/con ZSW send

**Description:** Connector output to interconnect the status words to a PZD send word.

**Index:**
- \([0]\) = Status word 1
- \([1]\) = Status word 2
- \([2]\) = Free status word 3
- \([3]\) = Free status word 4
- \([4]\) = Free status word 5

**Bit field:**

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Bit 0</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>01</td>
<td>Bit 1</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
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<tr>
<td>02</td>
<td>Bit 2</td>
<td>ON</td>
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<tr>
<td>03</td>
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<tr>
<td>04</td>
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<tr>
<td>06</td>
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<td>07</td>
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</tr>
<tr>
<td>10</td>
<td>Bit 10</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
</tbody>
</table>
Parameter

List of parameters

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Bit 0</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>01</td>
<td>Bit 1</td>
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<tr>
<td>02</td>
<td>Bit 2</td>
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</tr>
<tr>
<td>14</td>
<td>Bit 14</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>15</td>
<td>Bit 15</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
</tbody>
</table>

Description: Binector output for bit-serial interconnection of PZD1 (normally control word 1) received from the PROFIdrive controller.

Note: IF1: Interface 1

Dependency: Refer to: p2051, p2080, p2081, p2082, p2083

Note: r2089 together with p2080 to p2084 forms five binector-connector converters.

r2090.0...15 BO: IF1 PROFIBUS PZD1 receive bit-serial / IF1 PZD1 recv bitw

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Bit 0</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>01</td>
<td>Bit 1</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>02</td>
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<td>03</td>
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<tr>
<td>07</td>
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<td>-</td>
</tr>
<tr>
<td>12</td>
<td>Bit 12</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
</tbody>
</table>

Description: Binector output for bit-serial interconnection of PZD1 (normally control word 1) received from the PROFIdrive controller.

Note: IF1: Interface 1

Dependency: Refer to: p2051, p2080, p2081, p2082, p2083

Note: r2089 together with p2080 to p2084 forms five binector-connector converters.
### List of parameters

**Note:**

IF1: Interface 1

---

**r2092.0...15**

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Bit 0</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>01</td>
<td>Bit 1</td>
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<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>02</td>
<td>Bit 2</td>
<td>ON</td>
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<td>04</td>
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<td>08</td>
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<td>15</td>
<td>Bit 15</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
</tbody>
</table>

**Description:**

Binector output for bit-serial interconnection of PZD3 received from the PROFIdrive controller.

---

**r2093.0...15**

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Bit 0</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>01</td>
<td>Bit 1</td>
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<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>02</td>
<td>Bit 2</td>
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<tr>
<td>03</td>
<td>Bit 3</td>
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<tr>
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<td>06</td>
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<tr>
<td>07</td>
<td>Bit 7</td>
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<tr>
<td>08</td>
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<td>Bit 10</td>
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<td>13</td>
<td>Bit 13</td>
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</tr>
<tr>
<td>14</td>
<td>Bit 14</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>15</td>
<td>Bit 15</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
</tbody>
</table>

**Description:**

Binector output for bit-serial interconnection of PZD4 (normally control word 2) received from the PROFIdrive controller.
**r2094.0...15**

**BO: Connector-binector converter binector output / Con/bin outp**

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

- Can be changed: -
- Calculated: -
- Access level: 3

**Data type:** Unsigned16
- Dynamic index: -
- Func. diagram: 2468

**P-Group:** Communications
- Units group: -
- Unit selection: -

**Not for motor type:** -
- Scaling: -
- Expert list: 1

**Min**
- -

**Max**
- -

**Factory setting**
- -

**Description:**
Binector output for bit-serial onward interconnection of a PZD word received from the PROFIdrive controller.
The PZD is selected via p2099[0].

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Bit 0</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>01</td>
<td>Bit 1</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>02</td>
<td>Bit 2</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>03</td>
<td>Bit 3</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>04</td>
<td>Bit 4</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>05</td>
<td>Bit 5</td>
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<tr>
<td>06</td>
<td>Bit 6</td>
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<td>-</td>
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<tr>
<td>07</td>
<td>Bit 7</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>08</td>
<td>Bit 8</td>
<td>ON</td>
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<td>-</td>
</tr>
<tr>
<td>09</td>
<td>Bit 9</td>
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<td>-</td>
</tr>
<tr>
<td>10</td>
<td>Bit 10</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>11</td>
<td>Bit 11</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>12</td>
<td>Bit 12</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>13</td>
<td>Bit 13</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>14</td>
<td>Bit 14</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>15</td>
<td>Bit 15</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
</tbody>
</table>

**Dependency:**
Refer to: p2099

**r2095.0...15**

**BO: Connector-binector converter binector output / Con/bin outp**

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

- Can be changed: -
- Calculated: -
- Access level: 3

**Data type:** Unsigned16
- Dynamic index: -
- Func. diagram: 2468

**P-Group:** Communications
- Units group: -
- Unit selection: -

**Not for motor type:** -
- Scaling: -
- Expert list: 1

**Min**
- -

**Max**
- -

**Factory setting**
- -

**Description:**
Binector output for bit-serial interconnection of a PZD word received from the PROFIdrive controller.
The PZD is selected via p2099[1].

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Bit 0</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>01</td>
<td>Bit 1</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>02</td>
<td>Bit 2</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>03</td>
<td>Bit 3</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>04</td>
<td>Bit 4</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>05</td>
<td>Bit 5</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>06</td>
<td>Bit 6</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>07</td>
<td>Bit 7</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>08</td>
<td>Bit 8</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>09</td>
<td>Bit 9</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>10</td>
<td>Bit 10</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>11</td>
<td>Bit 11</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>12</td>
<td>Bit 12</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>13</td>
<td>Bit 13</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>14</td>
<td>Bit 14</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>15</td>
<td>Bit 15</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
</tbody>
</table>

**Dependency:**
Refer to: p2099
**p2098[0...1]**  
**Inverter connector-binector converter binector output / Con/bin outp inv**  
SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
Can be changed: U, T  
Calculated: -  
Access level: 3  
Data type: Unsigned16  
Dynamic index: -  
Func. diagram: 2468  
P-Group: Communications  
Units group: -  
Unit selection: -  
Not for motor type: -  
Scaling: -  
Expert list: 1  
Min: -  
Max: -  
Factory setting: 0000 0000 0000 0000 bin  
Description:  
Setting to invert the individual binector outputs of the connector-binector converter.  
Using p2098[0], the signals of CI: p2099[0] are influenced.  
Using p2098[1], the signals of CI: p2099[1] are influenced.  
Bit field:  
<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Bit 0</td>
<td>Inverted</td>
<td>Not inverted</td>
<td>-</td>
</tr>
<tr>
<td>01</td>
<td>Bit 1</td>
<td>Inverted</td>
<td>Not inverted</td>
<td>-</td>
</tr>
<tr>
<td>02</td>
<td>Bit 2</td>
<td>Inverted</td>
<td>Not inverted</td>
<td>-</td>
</tr>
<tr>
<td>03</td>
<td>Bit 3</td>
<td>Inverted</td>
<td>Not inverted</td>
<td>-</td>
</tr>
<tr>
<td>04</td>
<td>Bit 4</td>
<td>Inverted</td>
<td>Not inverted</td>
<td>-</td>
</tr>
<tr>
<td>05</td>
<td>Bit 5</td>
<td>Inverted</td>
<td>Not inverted</td>
<td>-</td>
</tr>
<tr>
<td>06</td>
<td>Bit 6</td>
<td>Inverted</td>
<td>Not inverted</td>
<td>-</td>
</tr>
<tr>
<td>07</td>
<td>Bit 7</td>
<td>Inverted</td>
<td>Not inverted</td>
<td>-</td>
</tr>
<tr>
<td>08</td>
<td>Bit 8</td>
<td>Inverted</td>
<td>Not inverted</td>
<td>-</td>
</tr>
<tr>
<td>09</td>
<td>Bit 9</td>
<td>Inverted</td>
<td>Not inverted</td>
<td>-</td>
</tr>
<tr>
<td>10</td>
<td>Bit 10</td>
<td>Inverted</td>
<td>Not inverted</td>
<td>-</td>
</tr>
<tr>
<td>11</td>
<td>Bit 11</td>
<td>Inverted</td>
<td>Not inverted</td>
<td>-</td>
</tr>
<tr>
<td>12</td>
<td>Bit 12</td>
<td>Inverted</td>
<td>Not inverted</td>
<td>-</td>
</tr>
<tr>
<td>13</td>
<td>Bit 13</td>
<td>Inverted</td>
<td>Not inverted</td>
<td>-</td>
</tr>
<tr>
<td>14</td>
<td>Bit 14</td>
<td>Inverted</td>
<td>Not inverted</td>
<td>-</td>
</tr>
<tr>
<td>15</td>
<td>Bit 15</td>
<td>Inverted</td>
<td>Not inverted</td>
<td>-</td>
</tr>
</tbody>
</table>

Dependency:  
Refer to: r2094, r2095, p2099

**p2099[0...1]**  
**CI: Connector-binector converter signal source / Con/bin S_src**  
SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
Can be changed: U, T  
Calculated: -  
Access level: 3  
Data type: Unsigned32 / Integer16  
Dynamic index: -  
Func. diagram: 2468  
P-Group: Communications  
Units group: -  
Unit selection: -  
Not for motor type: -  
Scaling: -  
Expert list: 1  
Min: -  
Max: -  
Factory setting: 0  
Description:  
Sets the signal source for the connector-binector converter.  
A PZD receive word can be selected as signal source. The signals are available to be serially passed-on (interconnection).  
Dependency:  
Refer to: r2094, r2095  
Note:  
From the signal source set via the connector input, the corresponding lower 16 bits are converted.  
p2099[0...1] together with r2094.0...15 and r2095.0...15 forms two connector-binector converters:  
Connector input p2099[0] to binector output in r2094.0...15  
Connector input p2099[1] to binector output in r2095.0...15

**p2100[0...19]**  
**Setting the fault number for fault response / F_no F response**  
SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
Can be changed: U, T  
Calculated: -  
Access level: 3  
Data type: Unsigned16  
Dynamic index: -  
Func. diagram: 1750, 8075  
P-Group: Messages  
Units group: -  
Unit selection: -  
Not for motor type: -  
Scaling: -  
Expert list: 1  
Min: 0  
Max: 65535  
Factory setting: 0  
Description:  
Selects the faults for which the fault response should be changed
**Parameter**

**List of parameters**

**Dependency:**
The fault is selected and the required response is set under the same index.
Refer to: p2101

**Notice:**
For the following cases, it is not possible to re-parameterize the fault response to a fault:
- if there is no existing fault number.
- the message type is not "fault" (F).
- when a fault is present.

**p2101[0...19] Setting the fault response / Fault response**

<table>
<thead>
<tr>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>U, T</td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

**Data type:** Integer16

**P-Group:** Messages

**Not for motor type:**
- OFF1
- OFF2
- OFF3
- STOP1 (being developed)
- STOP2
- DC braking
- ENCODER (p0491)

**Description:**
Sets the fault response for the selected fault.

**Value:**
- 0: NONE
- 1: OFF1
- 2: OFF2
- 3: OFF3
- 4: STOP1 (being developed)
- 5: STOP2
- 6: DC braking
- 7: ENCODER (p0491)

**Dependency:**
The fault is selected and the required response is set under the same index.
Refer to: p2100

**Notice:**
It is not possible to re-parameterize the response to a specific fault for faults that are already present (queued).

**Note:**
The fault response can only be changed for faults with the appropriate identification (see the List Manual, chapter "Faults and alarms").

Example:
F12345 and fault response = OFF3 (OFF1, OFF2, NONE)

--> The default fault response OFF3 can be changed to OFF1, OFF2 or NONE.

Re value = 1 (OFF1):
Braking along the ramp-function generator down ramp followed by a pulse inhibit.

Re value = 2 (OFF2):
Internal/external pulse inhibit.

Re value = 3 (OFF3):
Braking along the OFF3 down ramp followed by a pulse inhibit.

Re value = 5 (STOP2):
\( n_{set} = 0 \)

Re Value = 6 (DCBRK):
The value can only be set for all motor data sets when \( p1231 = 3, 4 \).
- a) This function is not supported for synchronous motors (\( p0300 = 2xx, 4xx \)).
- b) For induction motors (\( p0300 = 1xx \)), the DC braking is initiated.

Re value = 7 (ENCODER (p0491)):
The fault response set in p0491 is executed if applicable.

**p2102 BI: Acknowledge all faults / Ackn all faults**

<table>
<thead>
<tr>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>U, T</td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

**CU_S110-CAN, CU_S110-DP, CU_S110-PN**

**Data type:** Unsigned32 / Binary

**P-Group:** Messages

**Not for motor type:**
- -

**Min**
- -

**Max**
- -

**Factory setting**
- 0

**Description:**
Sets the signal source to acknowledge all faults at all drive objects of the drive system.
### List of parameters

**Note:** A fault acknowledgement is triggered with a 0/1 signal.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Notice</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p2103[0...n]</td>
<td><strong>BI: 1. Acknowledge faults / 1. Acknowledge</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Can be changed: U, T</td>
<td>Calculated: -</td>
<td>Access level: 3</td>
</tr>
<tr>
<td>Data type: Unsigned32 / Binary</td>
<td>Dynamic index: CDS, p0170</td>
<td>Func. diagram: 2441, 2442, 2443, 2447, 2475, 2546, 9220, 9677, 9678</td>
<td></td>
</tr>
<tr>
<td>P-Group: Messages</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>p2104[0...n]</td>
<td><strong>BI: 2. Acknowledge faults / 2. Acknowledge</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Can be changed: U, T</td>
<td>Calculated: -</td>
<td>Access level: 3</td>
</tr>
<tr>
<td>Data type: Unsigned32 / Binary</td>
<td>Dynamic index: CDS, p0170</td>
<td>Func. diagram: 2546, 8060</td>
<td></td>
</tr>
<tr>
<td>P-Group: Messages</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>p2105[0...n]</td>
<td><strong>BI: 3. Acknowledge faults / 3. Acknowledge</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Can be changed: U, T</td>
<td>Calculated: -</td>
<td>Access level: 3</td>
</tr>
<tr>
<td>Data type: Unsigned32 / Binary</td>
<td>Dynamic index: CDS, p0170</td>
<td>Func. diagram: 2546, 8060</td>
<td></td>
</tr>
<tr>
<td>P-Group: Messages</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>p2106[0...n]</td>
<td><strong>BI: External fault 1 / External fault 1</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Can be changed: U, T</td>
<td>Calculated: -</td>
<td>Access level: 3</td>
</tr>
<tr>
<td>Data type: Unsigned32 / Binary</td>
<td>Dynamic index: CDS, p0170</td>
<td>Func. diagram: 2546</td>
<td></td>
</tr>
<tr>
<td>P-Group: Messages</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Dependency:</strong></td>
<td>Refer to: F07860</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Note:</strong></td>
<td>An external fault is triggered with a 1/0 signal.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>If this fault is output at the Control Unit, then it is transferred to all existing drive objects.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### p2107[0...n] BI: External fault 2 / External fault 2

| Description: | Sets the signal source for external fault 2. |
| Dependency: | Refer to: F07861 |
| Note: | An external fault is triggered with a 1/0 signal. If this fault is output at the Control Unit, then it is transferred to all existing drive objects. |

#### Parameters:
- **Type**: Unsigned32 / Binary
- **Group**: Messages
- **Not for motor type**: 
- **Min**: 
- **Max**: 

| Can be changed: | U, T |
| Calculated: | - |
| Access level: | 3 |

#### Data:
- **Dynamic index**: CDS, p0170
- **Unit selection**: 
- **Expert list**: 1
- **Factory setting**: 

### p2108[0...n] BI: External fault 3 / External fault 3

| Description: | Sets the signal source for external fault 3. External fault 3 is initiated by the following AND logic operation: - BI: p2108 negated - BI: p3111 - BI: p3112 negated |
| Dependency: | Refer to: F07862 |
| Note: | An external fault is triggered with a 1/0 signal. If this fault is output at the Control Unit, then it is transferred to all existing drive objects. |

#### Parameters:
- **Type**: Unsigned32 / Binary
- **Group**: Messages
- **Not for motor type**: 
- **Min**: 
- **Max**: 

| Can be changed: | U, T |
| Calculated: | - |
| Access level: | 3 |

#### Data:
- **Dynamic index**: CDS, p0170
- **Unit selection**: 
- **Expert list**: 1
- **Factory setting**: 

### r2109[0...63] Fault time removed in milliseconds / t_flt resolved ms

| Description: | Displays the system runtime in milliseconds when the fault was removed. |
| Dependency: | Refer to: r0945, r0947, r0948, r0949, r2114, r2130, r2133, r2136, r3115, r3120, r3122 |
| Notice: | The time comprises r2136 (days) and r2109 (milliseconds). |
| Note: | The structure of the fault buffer and the assignment of the indices is shown in r0945. |

#### Parameters:
- **Type**: Unsigned32
- **Group**: Messages
- **Not for motor type**: 
- **Min**: 
- **Max**: 

| All objects: | - [ms] |
| Calculated: | - [ms] |
| Access level: | 3 |
| Dynamic index: | - |
| Unit selection: | - |

### r2110[0...63] Alarm number / Alarm number

| Description: | This parameter is identical to r2122. |
| Can be changed: | - |
| Calculated: | - |
| Access level: | 2 |
| Dynamic index: | - |
| Unit selection: | - |

#### Data:
- **Type**: Unsigned16
- **Group**: Messages
- **Not for motor type**: 
- **Min**: 
- **Max**: 

| All objects: | - |

### Notes:
- The buffer parameters are cyclically updated in the background (refer to status signal in r2139).
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>p2111</strong></td>
<td>Alarm counter / Alarm counter</td>
<td>Number of alarms that have occurred after the last reset.</td>
<td>The parameter is reset to 0 at POWER ON.</td>
</tr>
<tr>
<td>All objects</td>
<td>Can be changed: U, T</td>
<td>Calculated: -</td>
<td>Access level: 3</td>
</tr>
<tr>
<td>Data type: Unsigned16</td>
<td>Dynamic index: -</td>
<td></td>
<td>Func. diagram: 1750, 8065</td>
</tr>
<tr>
<td>P-Group: Messages</td>
<td>Units group: -</td>
<td></td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>Scaling: -</td>
<td></td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>65535</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>r2114[0...1]</strong></td>
<td>System runtime total / Sys runtime tot</td>
<td>Displays the total system runtime for the drive unit.</td>
<td></td>
</tr>
<tr>
<td>CU_S110-CAN, CU_S110-DP, CU_S110-PN</td>
<td>Can be changed: -</td>
<td>Calculated: -</td>
<td>Access level: 3</td>
</tr>
<tr>
<td>Data type: Unsigned32</td>
<td>Dynamic index: -</td>
<td></td>
<td>Func. diagram: -</td>
</tr>
<tr>
<td>P-Group: Messages</td>
<td>Units group: -</td>
<td></td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>Scaling: -</td>
<td></td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>p2116[0...n]</strong></td>
<td>BI: External alarm 2 / External alarm 2</td>
<td>Sets the signal source for external alarm 2.</td>
<td>An external alarm is triggered with a 1/0 signal.</td>
</tr>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Can be changed: U, T</td>
<td>Calculated: -</td>
<td>Access level: 3</td>
</tr>
<tr>
<td>Data type: Unsigned32 / Binary</td>
<td>Dynamic index: CDS, p0170</td>
<td></td>
<td>Func. diagram: 2546</td>
</tr>
<tr>
<td>P-Group: Messages</td>
<td>Units group: -</td>
<td></td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>Scaling: -</td>
<td></td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: The time in r2114 is used to display the times for faults and alarms. When the electronic power supply is switched out, the counter continues to run with the last value that was saved.
Parameter

List of parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p2117[0...n]</td>
<td>Sets the signal source for external alarm 3.</td>
<td>Refers to: A07852</td>
<td>An external alarm is triggered with a 1/0 signal.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p2118[0...19]</td>
<td>Sets the message number for message type. / Msg_no Msg_type</td>
<td>Refers to: p2119</td>
<td>It is not possible to re-parameterize the message type in the following cases:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p2119[0...19]</td>
<td>Setting the message type / Message type</td>
<td>Refers to: p2118</td>
<td>The message type can only be changed for messages with the appropriate identification.</td>
</tr>
</tbody>
</table>
### List of parameters

#### r2120
**Description:**
Displays the sum of all of the fault and alarm buffer changes in the drive unit.

**Dependency:**
Refer to: r0944, r2121

#### r2121
**Description:**
This counter is incremented every time the alarm buffer changes.

**Dependency:**
Refer to: r2110, r2122, r2123, r2124, r2125

#### r2122[0...63]
**Alarm code**

**Description:**
Displays the number of alarms that have occurred.

**Dependency:**
Refer to: r2110, r2122, r2123, r2124, r2125, r2134, r2145, r2146, r3121, r3123

**Note:**
The buffer parameters are cyclically updated in the background (refer to status signal in r2139).

Alarm buffer structure (general principle):
r2122[0], r2124[0], r2123[0], r2125[0] --> alarm 1 (the oldest)

...  
r2122[7], r2124[7], r2123[7], r2125[7] --> Alarm 8 (the latest)

When the alarm buffer is full, the alarms that have gone are entered into the alarm history:
r2122[8], r2124[8], r2123[8], r2125[8] --> Alarm 1 (the latest)

...  
r2122[63], r2124[63], r2123[63], r2125[63] --> alarm 56 (the oldest)

#### r2123[0...63]
**Alarm time received in milliseconds / t_alarm recv ms**

**Description:**
Displays the system runtime in milliseconds when the alarm occurred.

**Dependency:**
Refer to: r2110, r2114, r2122, r2124, r2125, r2134, r2145, r2146, r3121, r3123

**Notice:**
The time comprises r2145 (days) and r2123 (milliseconds).

**Note:**
The buffer parameters are cyclically updated in the background (refer to status signal in r2139).

The structure of the alarm buffer and the assignment of the indices is shown in r2122.
### r2124[0...63] Alarm value / Alarm value

**All objects**

<table>
<thead>
<tr>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
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<table>
<thead>
<tr>
<th>Data type:</th>
<th>Dynamic index:</th>
<th>Func. diagram:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integer32</td>
<td>-</td>
<td>1750, 8065</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>P-Group:</th>
<th>Units group:</th>
<th>Unit selection:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Messages</td>
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<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Not for motor type:</th>
<th>Scaling:</th>
<th>Expert list:</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**Description:**
Displays additional information about the active alarm (as integer number).

**Dependency:**
Refer to: r2110, r2122, r2123, r2125, r2134, r2145, r2146, r3121, r3123

**Note:**
The buffer parameters are cyclically updated in the background (refer to status signal in r2139).

The structure of the alarm buffer and the assignment of the indices is shown in r2122.

### r2125[0...63] Alarm time removed in milliseconds / t_alarm res ms

**All objects**

<table>
<thead>
<tr>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Data type:</th>
<th>Dynamic index:</th>
<th>Func. diagram:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unsigned32</td>
<td>-</td>
<td>1750, 8065</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>P-Group:</th>
<th>Units group:</th>
<th>Unit selection:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Messages</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Not for motor type:</th>
<th>Scaling:</th>
<th>Expert list:</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**Description:**
Displays the system runtime in milliseconds when the alarm was cleared.

**Dependency:**
Refer to: r2110, r2114, r2122, r2123, r2124, r2134, r2145, r2146, r3121, r3123

**Notice:**
The buffer parameters are cyclically updated in the background (refer to status signal in r2139).

The structure of the alarm buffer and the assignment of the indices is shown in r2122.

### p2126[0...19] Setting fault number for acknowledge mode / Fault_no ackn_mode

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

<table>
<thead>
<tr>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>U, T</td>
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<td>3</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Data type:</th>
<th>Dynamic index:</th>
<th>Func. diagram:</th>
</tr>
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<tbody>
<tr>
<td>Unsigned16</td>
<td>-</td>
<td>1750, 8075</td>
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</table>

<table>
<thead>
<tr>
<th>P-Group:</th>
<th>Units group:</th>
<th>Unit selection:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Messages</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Not for motor type:</th>
<th>Scaling:</th>
<th>Expert list:</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**Description:**
Selects the faults for which the acknowledge mode is to be changed

**Dependency:**
Selects the faults and sets the required acknowledge mode realized under the same index

**Notice:**
It is not possible to re-parameterize the acknowledge mode of a fault in the following cases:
- if there is no existing fault number.
- the message type is not "fault" (F).
- when a fault is present.

### p2127[0...19] Sets acknowledgement mode / Acknowledge mode

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

<table>
<thead>
<tr>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>U, T</td>
<td>-</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Data type:</th>
<th>Dynamic index:</th>
<th>Func. diagram:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integer16</td>
<td>-</td>
<td>1750, 8075</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>P-Group:</th>
<th>Units group:</th>
<th>Unit selection:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Messages</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Not for motor type:</th>
<th>Scaling:</th>
<th>Expert list:</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**Description:**
Sets the acknowledge mode for selected fault.

**Value:**
1: Acknowledgment only using POWER ON
2: Ack IMMEDIATELY after the fault cause has been removed
3: Acknowledgement only for PULSE INHIBIT
Parameter

List of parameters

Dependency:
Selects the faults and sets the required acknowledge mode realized under the same index
Refer to: p2126

Notice:
It is not possible to re-parameterize the acknowledge mode of a fault in the following cases:
- if there is no existing fault number.
- the message type is not "fault" (F).
- when a fault is present.

Note:
The acknowledge mode can only be changed for faults with the appropriate identification.
Example:
F12345 and acknowledge mode = IMMEDIATE (POWER ON)
--> The acknowledge mode can be changed from IMMEDIATELY to POWER ON.

p2128[0...15] Selecting fault/alarm code for trigger / Message trigger

<table>
<thead>
<tr>
<th>All objects</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>U, T</td>
<td>-</td>
<td>3</td>
</tr>
</tbody>
</table>

Data type: Unsigned16
Dynamic index:
Units group:
Unit selection:
Expert list: 1

Min
Max
Factory setting
0
65535
0

Description:
Selects faults or alarms which can be used as trigger.

Dependency:
Refer to: r2129

r2129.0...15 CO/BO: Trigger word for faults and alarms / Trigger word

<table>
<thead>
<tr>
<th>All objects</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-</td>
<td>-</td>
<td>3</td>
</tr>
</tbody>
</table>

Data type: Unsigned16
Dynamic index:
Units group:
Unit selection:
Expert list: 1

Min
Max
Factory setting
- 
- 
-

Description:
Trigger signal for the selected faults and alarms

Bit field:

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Trigger signal p2128[0]</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>01</td>
<td>Trigger signal p2128[1]</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>02</td>
<td>Trigger signal p2128[2]</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>03</td>
<td>Trigger signal p2128[3]</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>04</td>
<td>Trigger signal p2128[4]</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>05</td>
<td>Trigger signal p2128[5]</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>06</td>
<td>Trigger signal p2128[6]</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>07</td>
<td>Trigger signal p2128[7]</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>08</td>
<td>Trigger signal p2128[8]</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>09</td>
<td>Trigger signal p2128[9]</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>10</td>
<td>Trigger signal p2128[10]</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>11</td>
<td>Trigger signal p2128[11]</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>12</td>
<td>Trigger signal p2128[12]</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>13</td>
<td>Trigger signal p2128[13]</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>14</td>
<td>Trigger signal p2128[14]</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>15</td>
<td>Trigger signal p2128[15]</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
</tbody>
</table>

Dependency:
If one of the faults or alarms selected in p2128[n] occurs, then the particular bit of this binector output is set.
Refer to: p2128

Note:
CO: r2129 = 0 --> None of the selected messages has occurred.
CO: r2129 > 0 --> At least one of the selected messages has occurred.
### r2130[0...63] Fault time received in days / t_fault_recv_days

<table>
<thead>
<tr>
<th>All objects</th>
<th>Can be changed: -</th>
<th>Calculated: -</th>
<th>Access level: 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type:</td>
<td>Unsigned16</td>
<td>Dynamic index: -</td>
<td>Func. diagram: 8060</td>
</tr>
<tr>
<td>P-Group:</td>
<td>Messages</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Displays the system runtime in days when the fault occurred.

**Dependency:** Refer to: r0945, r0947, r0948, r0949, r2109, r2114, r2133, r2136, r3115, r3120, r3122

**Notice:** The time comprises r2130 (days) and r0948 (milliseconds).

**Note:** The buffer parameters are cyclically updated in the background (refer to status signal in r2139).

### r2131 CO: Actual fault code / Actual fault code

<table>
<thead>
<tr>
<th>All objects</th>
<th>Can be changed: -</th>
<th>Calculated: -</th>
<th>Access level: 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type:</td>
<td>Unsigned16</td>
<td>Dynamic index: -</td>
<td>Func. diagram: 8060</td>
</tr>
<tr>
<td>P-Group:</td>
<td>Messages</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Displays the code of the oldest active fault.

**Dependency:** Refer to: r3131, r3132

**Note:** 0: No fault present.

### r2132 CO: Actual alarm code / Actual alarm code

<table>
<thead>
<tr>
<th>All objects</th>
<th>Can be changed: -</th>
<th>Calculated: -</th>
<th>Access level: 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type:</td>
<td>Unsigned16</td>
<td>Dynamic index: -</td>
<td>Func. diagram: 8060</td>
</tr>
<tr>
<td>P-Group:</td>
<td>Messages</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Displays the code of the last alarm that occurred.

**Note:** 0: No alarm present.

### r2133[0...63] Fault value for float values / Fault_val_float

<table>
<thead>
<tr>
<th>All objects</th>
<th>Can be changed: -</th>
<th>Calculated: -</th>
<th>Access level: 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type:</td>
<td>FloatingPoint32</td>
<td>Dynamic index: -</td>
<td>Func. diagram: 8060</td>
</tr>
<tr>
<td>P-Group:</td>
<td>Messages</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Displays additional information about the fault that occurred for float values.

**Dependency:** Refer to: r0945, r0947, r0948, r0949, r2109, r2130, r2136, r3115

**Note:** The buffer parameters are cyclically updated in the background (refer to status signal in r2139).
**List of parameters**

---

**r2134[0...63] Alarm value for float values / Alarm value float**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>r2134[0...63]</td>
<td>Displays additional information about the active alarm for float values.</td>
<td>Refer to: r2110, r2122, r2123, r2124, r2125, r2145, r2146, r3121, r3123</td>
<td>The buffer parameters are cyclically updated in the background (refer to status signal in r2139).</td>
</tr>
</tbody>
</table>

---

**r2135.0...15 CO/BO: Status word faults/alarms 2 / ZSW fault/alarm 2**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Notice</th>
</tr>
</thead>
<tbody>
<tr>
<td>r2135.0...15</td>
<td>Displays the second status word of faults and alarms.</td>
<td></td>
<td>The time comprises r2136 (days) and r2109 (milliseconds).</td>
</tr>
</tbody>
</table>

---

**r2136[0...63] Fault time removed in days / t_flt resolv. days**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Notice</th>
</tr>
</thead>
<tbody>
<tr>
<td>r2136[0...63]</td>
<td>Displays the system runtime in days when the fault was removed.</td>
<td>Refer to: r0945, r0947, r0948, r0949, r2109, r2114, r2130, r2133, r3115, r3120, r3122</td>
<td>The buffer parameters are cyclically updated in the background (refer to status signal in r2139).</td>
</tr>
</tbody>
</table>

---

**r2138.7...15 CO/BO: Control word faults/alarms / STW fault/alarm**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Notice</th>
</tr>
</thead>
<tbody>
<tr>
<td>r2138.7...15</td>
<td>Displays the control word of the faults and alarms.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### List of parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>External fault 2 (F07861) effective</td>
<td>Refer to: p2103, p2104, p2105, p2106, p2107, p2108, p2112, p2116, p2117</td>
</tr>
<tr>
<td>15</td>
<td>External fault 3 (F07862) effective</td>
<td></td>
</tr>
</tbody>
</table>

#### r2139.0...12

**CO/BO: Status word faults/alarms 1 / ZSW fault/alarm 1**

<table>
<thead>
<tr>
<th>All objects</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Data type:</th>
<th>Dynamic index:</th>
<th>Func. diagram:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unsigned16</td>
<td>-</td>
<td>1530, 2548</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>P-Group:</th>
<th>Units group:</th>
<th>Unit selection:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Displays, signals</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Not for motor type:</th>
<th>Scaling:</th>
<th>Expert list:</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Description:** Displays the first status word of faults and alarms.

**Note:**

Re bit 03, 05, 07:

These bits are set if at least one fault/alarm occurs. Data is entered into the fault/alarm buffer with delay. This is the reason that the fault/alarm buffer should only be read if, after "fault present"/"alarm present" has occurred, a change in the buffer was also detected (r6944, r9744, r2121).

Re bit 06, 08:

These status bits are used for internal diagnostic purposes only. Re bit 11, 12:

These status bits are used for the classification of internal alarm classes and are intended for diagnostic purposes only on certain automation systems with integrated SINAMICS functionality.

#### p2140[0...n]

**Hysteresis speed 2 / n_hysteresis 2**

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>U, T</td>
<td>CALC_MOD_LIM_REF</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Data type:</th>
<th>Dynamic index:</th>
<th>Func. diagram:</th>
</tr>
</thead>
<tbody>
<tr>
<td>FloatingPoint32</td>
<td>-</td>
<td>8010</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>P-Group:</th>
<th>Units group:</th>
<th>Unit selection:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Messages</td>
<td>3_1</td>
<td>p0505</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Not for motor type:</th>
<th>Scaling:</th>
<th>Expert list:</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.00 [rpm]</td>
<td>300.00 [rpm]</td>
<td>90.00 [rpm]</td>
</tr>
</tbody>
</table>

**Description:** Sets the hysteresis speed (bandwidth) for the following signals:

"\[\text{n_act} \leq \text{speed threshold value 2}\]" (BO: r2197.1)

"\[\text{n_act} > \text{speed threshold value 2}\]" (BO: r2197.2)

**Dependency:** Refer to: p2155, r2197

#### p2141[0...n]

**Speed threshold 1 / n_thresh val 1**

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>U, T</td>
<td>CALC_MOD_LIM_REF</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Data type:</th>
<th>Dynamic index:</th>
<th>Func. diagram:</th>
</tr>
</thead>
<tbody>
<tr>
<td>FloatingPoint32</td>
<td>-</td>
<td>8010</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>P-Group:</th>
<th>Units group:</th>
<th>Unit selection:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Messages</td>
<td>3_1</td>
<td>p0505</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Not for motor type:</th>
<th>Scaling:</th>
<th>Expert list:</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.00 [rpm]</td>
<td>210000.00 [rpm]</td>
<td>5.00 [rpm]</td>
</tr>
</tbody>
</table>

**Description:** Sets the speed threshold value for the signal "\[n or n comparison value reached or exceeded\]" (BO: r2199.1).

**Dependency:** Refer to: p2142, r2199
### List of parameters

#### p2142[0...n] Hysteresis speed 1 / n_hysteresis 1

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Calculated</th>
<th>Access level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed: U, T</td>
<td>FloatingPoint32</td>
<td>CALC_MOD_LIM_REF</td>
<td>3</td>
</tr>
<tr>
<td>Data type:</td>
<td>Dynamic index: DDS, p0180</td>
<td>Func. diagram: 8010</td>
<td></td>
</tr>
<tr>
<td>P-Group: Messages</td>
<td>Units group: 3_1</td>
<td>Unit selection: p0505</td>
<td></td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>Scaling:</td>
<td>Expert list: 1</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.00 [rpm]</td>
<td>300.00 [rpm]</td>
<td>2.00 [rpm]</td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Sets the hysteresis speed (bandwidth) for the signal "f or n / v comparison value reached or exceeded" (BO: r2199.1).

**Dependency:** Refer to: p2141, r2199

#### p2144[0...n] BI: Motor stall monitoring enable (negated) / Mot stall enab neg

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Calculated</th>
<th>Access level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed: U, T</td>
<td>Unsigned32 / Binary</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>Data type:</td>
<td>Dynamic index: CDS, p0170</td>
<td>Func. diagram: 8012</td>
<td></td>
</tr>
<tr>
<td>P-Group:</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
<td></td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>Scaling:</td>
<td>Expert list: 1</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td>-</td>
<td>-</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Sets the signal source for the negated enable (0 = enable) of the motor stall monitoring.

**Dependency:** Refer to: p2163, p2164, p2166, r2197, r2198

**Note:** Refer to: F07900

If the enable signal is connected to r2197.7 then the stall signal is suppressed if there is no speed setpoint - actual value deviation.

#### r2145[0...63] Alarm time received in days / t_alarm recv days

**All objects**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Calculated</th>
<th>Access level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed:</td>
<td>Unsigned16</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>Data type:</td>
<td>Dynamic index:</td>
<td>Func. diagram: 8065</td>
<td></td>
</tr>
<tr>
<td>P-Group: Messages</td>
<td>Units group:</td>
<td>Unit selection: -</td>
<td></td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>Scaling:</td>
<td>Expert list: 1</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Displays the system runtime in days when the alarm occurred.

**Dependency:** Refer to: r2110, r2114, r2122, r2123, r2124, r2125, r2134, r2146, r3121, r3123

**Notice:** The time comprises r2145 (days) and r2123 (milliseconds).

**Note:** The buffer parameters are cyclically updated in the background (refer to status signal in r2139).

#### r2146[0...63] Alarm time removed in days / t_alarm res days

**All objects**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Calculated</th>
<th>Access level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed:</td>
<td>Unsigned16</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>Data type:</td>
<td>Dynamic index:</td>
<td>Func. diagram: 8065</td>
<td></td>
</tr>
<tr>
<td>P-Group: Messages</td>
<td>Units group:</td>
<td>Unit selection: -</td>
<td></td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>Scaling:</td>
<td>Expert list: 1</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Displays the system runtime in days when the alarm was cleared.

**Dependency:** Refer to: r2110, r2114, r2122, r2123, r2124, r2125, r2134, r2145, r3121, r3123

**Notice:** The time comprises r2146 (days) and r2125 (milliseconds).

**Note:** The buffer parameters are cyclically updated in the background (refer to status signal in r2139).
### p2147 Delete fault buffer of all drive objects / Del fault buffer

**Parameter list:**
- **CU_S110-CAN, CU_S110-DP, CU_S110-PN**

**Description:** Setting to delete the fault buffer of all existing drive objects.

**Value:**
- **0:** Inactive
- **1:** Start to delete the fault buffer of all drive objects

**Dependency:**
Refer to: r0945, r0947, r0948, r0949, r2109, r2130, r2133, r2136

**Note:** p2147 is automatically set to 0 after execution.

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Enable alarm A07903</td>
<td>Yes</td>
<td>No</td>
<td>8010</td>
</tr>
<tr>
<td>01</td>
<td>Load monitoring only in the 1st quadrant</td>
<td>Yes</td>
<td>No</td>
<td>8013</td>
</tr>
<tr>
<td>03</td>
<td>n_act &gt; p2155 own hysteresis</td>
<td>Yes</td>
<td>No</td>
<td>8010</td>
</tr>
<tr>
<td>15</td>
<td>Automatic parameterization carried out (p0340 = 1, p3900 &gt; 0)</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
</tbody>
</table>

**Notice:** The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

**Note:** The binector input is automatically pre-assigned to r1199.2.

The following applies for SERVO:
- The pre-assignment is only made when the function module "setpoint channel" is activated (r0108.8 = 1).

### p2148[0...n] BI: RFG active / RFG active

**Parameter list:**
- **SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

**Description:** Sets the signal source for the signal "ramp-function generator active" for the following signals/messages:
- "Speed setpoint - actual value deviation within tolerance t_on" (BO: r2199.4)
- "Ramp-up/ramp-down completed" (BO: r2199.5)

**Notice:** The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

**Note:** The binector input is automatically pre-assigned to r1199.2.

The following applies for SERVO:
- The pre-assignment is only made when the function module "setpoint channel" is activated (r0108.8 = 1).

### p2149[0...n] Monitoring configuration / Monit config

**Parameter list:**
- **SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

**Description:** Sets the configuration for messages and monitoring functions.
### Re bit 15:
The bit indicates whether the automatic parameterization (p0340 = 1, p3900 > 0) for the parameters of the extended monitoring functions was carried out. If the bit is not set (e.g. when the configuration is activated (p0108.15)), the parameterization is automatically carried out during booting even if r3925.0 is already 1.

### p2150[0...n]  Hysteresis speed 3 / n_hysteresis 3

<table>
<thead>
<tr>
<th>SERVO_S110-CAN,</th>
<th>SERVO_S110-DP,</th>
<th>SERVO_S110-PN</th>
</tr>
</thead>
</table>

**Can be changed:** U, T  
**Calculated:** CALC_MOD_LIM_REF  
**Access level:** 3

**Data type:** FloatingPoint32  
**Dynamic index:** DDS, p0180  
**Units group:** 3_1  
**Scaling:** -  
**Expert list:** 1

**Description:** Sets the hysteresis speed (bandwidth) for the following signals:
- "|n_act| < speed threshold value 3" (BO: r2199.0)
- "n_set >= 0" (BO: r2198.5)
- "n_act >= 0" (BO: r2197.3)

**Dependency:** Refer to: p2161, r2197, r2199

**Minimum:** 0.00 [rpm]  
**Maximum:** 300.00 [rpm]

### p2151[0...n]  CI: Speed setpoint for messages/signals / n_set for msg

<table>
<thead>
<tr>
<th>SERVO_S110-CAN,</th>
<th>SERVO_S110-DP,</th>
<th>SERVO_S110-PN</th>
</tr>
</thead>
</table>

**Can be changed:** T  
**Calculated:** -  
**Access level:** 3

**Data type:** Unsigned32 / FloatingPoint32  
**Dynamic index:** CDS, p0170  
**Units group:** -  
**Scaling:** p2000  
**Expert list:** 1

**Description:** Sets the signal source for the speed setpoint for the following messages:
- "Speed setpoint - actual value deviation within tolerance t_off" (BO: r2197.7)
- "Ramp-up/ramp-down completed" (BO: r2199.5)
- "|n_set| < p2161" (BO: r2198.4)
- "n_set > 0" (BO: r2198.5)

**Dependency:** Refer to: r2197, r2198, r2199

### p2153[0...n]  Speed actual value filter time constant / n_act_filt T

<table>
<thead>
<tr>
<th>SERVO_S110-CAN,</th>
<th>SERVO_S110-DP,</th>
<th>SERVO_S110-PN</th>
</tr>
</thead>
</table>

**Can be changed:** U, T  
**Calculated:** -  
**Access level:** 3

**Data type:** FloatingPoint32  
**Dynamic index:** DDS, p0180  
**Units group:** -  
**Scaling:** -  
**Expert list:** 1

**Description:** Sets the time constant of the PT1 element to smooth the speed / velocity actual value.

**Dependency:** Refer to: r2169

**Minimum:** 0 [ms]  
**Maximum:** 1000000 [ms]

### p2154[0...n]  CI: Speed setpoint 2 / n_set 2

<table>
<thead>
<tr>
<th>SERVO_S110-CAN,</th>
<th>SERVO_S110-DP,</th>
<th>SERVO_S110-PN</th>
</tr>
</thead>
</table>

**Can be changed:** T  
**Calculated:** -  
**Access level:** 3

**Data type:** Unsigned32 / FloatingPoint32  
**Dynamic index:** CDS, p0170  
**Units group:** -  
**Scaling:** p2000  
**Expert list:** 1

**Description:** Sets the signal source for speed setpoint 2.

**Dependency:** Refer to: r2169

**Minimum:** -  
**Maximum:** -

---

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SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3
The sum of p2151 and p2154 is used for the following messages/signals:
"Speed setpoint - actual value deviation within tolerance t_off" (r2197.7)
"Speed setpoint - actual value deviation within tolerance t_on" (r2199.4)
"Ramp-up/ramp-down completed" (r2199.5)

**Dependency:** Refer to: p2151, r2197, r2199

### p2155[0...n]
**Speed threshold 2 / n_threshold val 2**

- **SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**
- **Can be changed:** U, T
- **Calculated:** `CALC_MOD_LIM_REF`
- **Access level:** 3
- **Data type:** FloatingPoint32
- **Dynamic index:** DDS, p0180
- **Units group:** 3_1
- **Scaling:** -
- **Min:** 0.00 [rpm]
- **Max:** 210000.00 [rpm]
- **Factory setting:** 900.00 [rpm]

**Description:** Sets the speed threshold value for the following messages:
"|n_act| < speed threshold value 2" (BO: r2197.1)
"|n_act| > speed threshold value 2" (BO: r2197.2)

**Dependency:** Refer to: p2140, r2197

### p2156[0...n]
**On delay, comparison value reached / t_on_cmpr_val_rchd**

- **SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**
- **Can be changed:** U, T
- **Calculated:** -
- **Access level:** 2
- **Data type:** FloatingPoint32
- **Dynamic index:** DDS, p0180
- **Units group:** -
- **Scaling:** -
- **Min:** 0.0 [ms]
- **Max:** 10000.0 [ms]
- **Factory setting:** 0.0 [ms]

**Description:** Sets the switch-in delay time for the signal "comparison value reached" (BO: r2199.1).

**Dependency:** Refer to: p2141, p2142, r2199

### p2161[0...n]
**Speed threshold 3 / n_threshold val 3**

- **SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**
- **Can be changed:** U, T
- **Calculated:** `CALC_MOD_LIM_REF`
- **Access level:** 3
- **Data type:** FloatingPoint32
- **Dynamic index:** DDS, p0180
- **Units group:** 3_1
- **Scaling:** -
- **Min:** 0.00 [rpm]
- **Max:** 210000.00 [rpm]
- **Factory setting:** 5.00 [rpm]

**Description:** Sets the speed threshold value for the signal "|n_act| < speed threshold value 3" (BO: r2199.0).

**Dependency:** Refer to: p2150, r2199

### p2162[0...n]
**Hysteresis speed n_act > n_max / Hyst n_act>n_max**

- **SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**
- **Can be changed:** U, T
- **Calculated:** `CALC_MOD_LIM_REF`
- **Access level:** 2
- **Data type:** FloatingPoint32
- **Dynamic index:** DDS, p0180
- **Units group:** 3_1
- **Scaling:** -
- **Min:** 0.00 [rpm]
- **Max:** 60000.00 [rpm]
- **Factory setting:** 0.00 [rpm]

**Description:** Sets the hysteresis speed (bandwidth) for the signal "|n_act| > n_max" (BO: r2197.6).

**Dependency:** Refer to: r1084, r1087, r2197

**Notice:** For p0322 = 0, the following applies: p2162 <= 0.1 * p0311
For p0322 > 0, the following applies: p2162 <= 1.02 * p0322 - p1082
If one of the conditions is violated, p2162 is appropriately and automatically reduced when exiting the commissioning mode.

**Note:**
For a negative speed limit (r1087) the hysteresis is effective below the limit value and for a positive speed limit (r1084) above the limit value.
If significant overshoot occurs in the maximum speed range (e.g. due to load shedding), you are advised to increase the dynamic response of the speed controller (if possible). If this is insufficient, the hysteresis p2162 can only be increased by more than 10% of the rated speed when the maximum speed (p0322) of the motor is sufficiently greater than the speed limit p1082.

### p2163[0...n] Speed threshold 4 / n_thresh val 4

<table>
<thead>
<tr>
<th>Parameter Name</th>
<th>Description</th>
<th>Can be changed</th>
<th>Calculated</th>
<th>Access level</th>
</tr>
</thead>
<tbody>
<tr>
<td>p2163</td>
<td>Speed threshold 4 / n_thresh val 4</td>
<td>U, T</td>
<td>CALC_MOD_LIM_REF</td>
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<tr>
<td>P-Group</td>
<td>Messages</td>
<td>Units group: 3_1</td>
<td>p0505</td>
<td></td>
</tr>
<tr>
<td>Not for motor type</td>
<td>-</td>
<td>Scaling: -</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>0.00 [rpm]</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td></td>
<td>210000.00 [rpm]</td>
<td>90.00 [rpm]</td>
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</table>

**Dependency:** Refer to: p2164, p2166, r2197

### p2164[0...n] Hysteresis speed 4 / n_hysteresis 4

<table>
<thead>
<tr>
<th>Parameter Name</th>
<th>Description</th>
<th>Can be changed</th>
<th>Calculated</th>
<th>Access level</th>
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<tr>
<td>p2164</td>
<td>Hysteresis speed 4 / n_hysteresis 4</td>
<td>U, T</td>
<td>CALC_MOD_LIM_REF</td>
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<td>P-Group</td>
<td>Messages</td>
<td>Units group: 3_1</td>
<td>p0505</td>
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</tr>
<tr>
<td>Not for motor type</td>
<td>-</td>
<td>Scaling: -</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>0.00 [rpm]</td>
<td>Max</td>
<td>Factory setting</td>
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</tr>
<tr>
<td></td>
<td>200.00 [rpm]</td>
<td>2.00 [rpm]</td>
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</table>

**Dependency:** Refer to: p2163, p2166, r2197

### p2166[0...n] Off delay n_act = n_set / t_del_off n_i=n_so

<table>
<thead>
<tr>
<th>Parameter Name</th>
<th>Description</th>
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<th>Calculated</th>
<th>Access level</th>
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<tr>
<td>p2166</td>
<td>Off delay n_act = n_set / t_del_off n_i=n_so</td>
<td>U, T</td>
<td>-</td>
<td>2</td>
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<tr>
<td>P-Group</td>
<td>Messages</td>
<td>Units group: -</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Not for motor type</td>
<td>-</td>
<td>Scaling: -</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>0.00 [ms]</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10000.00 [ms]</td>
<td>200.00 [ms]</td>
<td></td>
<td></td>
</tr>
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</table>

**Dependency:** Refer to: p2163, p2164, r2197

### p2167[0...n] Switch-on delay n_act = n_set / t_on n_act=n_set

<table>
<thead>
<tr>
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<th>Calculated</th>
<th>Access level</th>
</tr>
</thead>
<tbody>
<tr>
<td>p2167</td>
<td>Switch-on delay n_act = n_set / t_on n_act=n_set</td>
<td>U, T</td>
<td>-</td>
<td>2</td>
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<tr>
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<tr>
<td>P-Group</td>
<td>Messages</td>
<td>Units group: -</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Not for motor type</td>
<td>-</td>
<td>Scaling: -</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>0.00 [ms]</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10000.00 [ms]</td>
<td>200.00 [ms]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Description: Displays the smoothed actual speed for messages/signals.
Dependency: Refer to: p2153

Description: Sets the torque threshold value for the signal "Torque setpoint < torque threshold value 1" (BO: r2198.10).
Dependency: Refer to: p2195, r2198

Description: Sets the speed threshold for the message "Motor locked" (BO: r2198.6).
Dependency: Refer to: p0500, p2177, r2198

Description: Sets the delay time for the message "Motor locked" (BO: r2198.6).
Dependency: Refer to: p0500, p2175, r2198

Description: Sets the response when evaluating the load monitoring.
Dependency: Refer to: p0500, p2181, r2198
**Value:**

0: Load monitoring disabled  
1: A07920 for torque/speed too low  
2: A07921 for torque/speed too high  
3: A07922 for torque/speed out of tolerance  
4: F07923 for torque/speed too low  
5: F07924 for torque/speed too high  
6: F07925 for torque/speed out of tolerance

**Dependency:**
Refer to: p2182, p2183, p2184, p2185, p2187, p2188, p2189, p2190, p2192, r2198  
Refer to: A07920, A07921, A07922, F07923, F07924, F07925

**Note:**
The response to the faults F07923 ... F07925 can be set. F07926 is evaluated only if p2181 is not zero.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Calculated</th>
<th>Dynamic index</th>
<th>Access level</th>
<th>Dependencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>p2182[0...n]</td>
<td>Can be changed: U, T</td>
<td>Calculated: -</td>
<td>Dynamic index: DDS, p0180</td>
<td>Access level: 3</td>
<td>p2182 &lt; p2183 &lt; p2184</td>
</tr>
<tr>
<td></td>
<td>Data type: FloatingPoint32</td>
<td>Dynamic index: DDS, p0180</td>
<td>Func. diagram: 8013</td>
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<tr>
<td></td>
<td>P-Group: Messages</td>
<td>Units group: 3_1</td>
<td>Unit selection: p0505</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.00 [rpm]</td>
<td>210000.00 [rpm]</td>
<td>150.00 [rpm]</td>
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</tr>
</tbody>
</table>

Sets the speed/torque envelope curve for load monitoring.  
The envelope curve (upper and lower envelope curve) is defined as follows based on 3 speed thresholds:

p2182 (n_threshold 1) -- p2185 (M_threshold 1, upper), p2186 (M_threshold 1, lower)  
p2183 (n_threshold 2) -- p2187 (M_threshold 2, upper), p2188 (M_threshold 2, lower)  
p2184 (n_threshold 3) -- p2189 (M_threshold 3, upper), p2190 (M_threshold 3, lower)

**Dependency:**
The following applies: p2182 < p2183 < p2184  
Refer to: p2183, p2184, p2185, p2186  
Refer to: A07926

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Calculated</th>
<th>Dynamic index</th>
<th>Access level</th>
<th>Dependencies</th>
</tr>
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<tbody>
<tr>
<td>p2183[0...n]</td>
<td>Can be changed: U, T</td>
<td>Calculated: -</td>
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<td>Access level: 3</td>
<td>p2182 &lt; p2183 &lt; p2184</td>
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<td>Dynamic index: DDS, p0180</td>
<td>Func. diagram: 8013</td>
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<td>P-Group: Messages</td>
<td>Units group: 3_1</td>
<td>Unit selection: p0505</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.00 [rpm]</td>
<td>210000.00 [rpm]</td>
<td>900.00 [rpm]</td>
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</tr>
</tbody>
</table>

Sets the speed/torque envelope curve for load monitoring.  
The envelope curve (upper and lower envelope curve) is defined as follows based on 3 speed thresholds:

p2182 (n_threshold 1) -- p2185 (M_threshold 1, upper), p2186 (M_threshold 1, lower)  
p2183 (n_threshold 2) -- p2187 (M_threshold 2, upper), p2188 (M_threshold 2, lower)  
p2184 (n_threshold 3) -- p2189 (M_threshold 3, upper), p2190 (M_threshold 3, lower)

**Dependency:**
The following applies: p2182 < p2183 < p2184  
Refer to: p2182, p2184, p2187, p2188  
Refer to: A07926

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Calculated</th>
<th>Dynamic index</th>
<th>Access level</th>
<th>Dependencies</th>
</tr>
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<tbody>
<tr>
<td>p2184[0...n]</td>
<td>Can be changed: U, T</td>
<td>Calculated: -</td>
<td>Dynamic index: DDS, p0180</td>
<td>Access level: 3</td>
<td>p2182 &lt; p2183 &lt; p2184</td>
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<td>Data type: FloatingPoint32</td>
<td>Dynamic index: DDS, p0180</td>
<td>Func. diagram: 8013</td>
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<tr>
<td></td>
<td>P-Group: Messages</td>
<td>Units group: 3_1</td>
<td>Unit selection: p0505</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.00 [rpm]</td>
<td>210000.00 [rpm]</td>
<td>1500.00 [rpm]</td>
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<td></td>
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</tbody>
</table>
The envelope curve (upper and lower envelope curve) is defined as follows based on 3 speed thresholds:

\[
p_{2182} (n_{\text{threshold 1}}) \rightarrow p_{2185} (M_{\text{threshold 1, upper}}), p_{2186} (M_{\text{threshold 1, lower}})
\]

\[
p_{2183} (n_{\text{threshold 2}}) \rightarrow p_{2187} (M_{\text{threshold 2, upper}}), p_{2188} (M_{\text{threshold 2, lower}})
\]

\[
p_{2184} (n_{\text{threshold 3}}) \rightarrow p_{2189} (M_{\text{threshold 3, upper}}), p_{2190} (M_{\text{threshold 3, lower}})
\]

**Dependency:**
The following applies: \( p_{2182} < p_{2183} < p_{2184} \)

Refer to: \( p_{2182}, p_{2183}, p_{2189}, p_{2190} \)

Refer to: A07926

### p2185\[0...n\] Load monitoring torque threshold 1, upper / \( M_{\text{thresh 1 upper}} \)

<table>
<thead>
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<th>Parameter</th>
<th>Description</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SERVO_S110-CAN</strong></td>
<td>Can be changed: U, T</td>
<td>2000000.00 [Nm]</td>
<td>10000000.00 [Nm]</td>
</tr>
<tr>
<td>(Ext msg)</td>
<td>Data type: FloatingPoint32</td>
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</tr>
<tr>
<td><strong>SERVO_S110-DP</strong></td>
<td>Dynamic index: DDS, p0180</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Ext msg)</td>
<td>Units group: 7_1</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SERVO_S110-PN</strong></td>
<td>Scaling: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Ext msg)</td>
<td><strong>Dependence:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Description:</strong></td>
<td>Sets the speed/torque / velocity/force envelope curve for the load monitoring.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Dependency:</strong></td>
<td>The following applies: ( p_{2185} &gt; p_{2186} )</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Note:</strong></td>
<td>The upper envelope curve is defined by ( p_{2185}, p_{2187} ) and ( p_{2189} ).</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### p2186\[0...n\] Load monitoring torque threshold 1, lower / \( M_{\text{thresh 1 lower}} \)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SERVO_S110-CAN</strong></td>
<td>Can be changed: U, T</td>
<td>2000000.00 [Nm]</td>
<td>0.00 [Nm]</td>
</tr>
<tr>
<td>(Ext msg)</td>
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</tr>
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<td><strong>SERVO_S110-DP</strong></td>
<td>Dynamic index: DDS, p0180</td>
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<tr>
<td>(Ext msg)</td>
<td>Units group: 7_1</td>
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<td></td>
</tr>
<tr>
<td><strong>SERVO_S110-PN</strong></td>
<td>Scaling: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Ext msg)</td>
<td><strong>Dependence:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Description:</strong></td>
<td>Sets the speed/torque / velocity/force envelope curve for the load monitoring.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Dependency:</strong></td>
<td>The following applies: ( p_{2186} &lt; p_{2185} )</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Note:</strong></td>
<td>The lower envelope curve is defined by ( p_{2186}, p_{2188} ) and ( p_{2190} ).</td>
<td></td>
<td></td>
</tr>
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</table>

### p2187\[0...n\] Load monitoring torque threshold 2, upper / \( M_{\text{thresh 2 upper}} \)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SERVO_S110-CAN</strong></td>
<td>Can be changed: U, T</td>
<td>2000000.00 [Nm]</td>
<td>10000000.00 [Nm]</td>
</tr>
<tr>
<td>(Ext msg)</td>
<td>Data type: FloatingPoint32</td>
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</tr>
<tr>
<td><strong>SERVO_S110-DP</strong></td>
<td>Dynamic index: DDS, p0180</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Ext msg)</td>
<td>Units group: 7_1</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SERVO_S110-PN</strong></td>
<td>Scaling: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Ext msg)</td>
<td><strong>Dependence:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Description:</strong></td>
<td>Sets the speed/torque / velocity/force envelope curve for the load monitoring.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Dependency:</strong></td>
<td>The following applies: ( p_{2187} &gt; p_{2188} )</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Note:</strong></td>
<td>The upper envelope curve is defined by ( p_{2185}, p_{2187} ) and ( p_{2189} ).</td>
<td></td>
<td></td>
</tr>
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</table>
### List of Parameters

**Parameter**

### List of Parameters

#### p2188[0...n]
**Load monitoring torque threshold 2, lower / M_thresh 2 lower**

<table>
<thead>
<tr>
<th>Details</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN (Ext msg), SERVO_S110-DP (Ext msg), SERVO_S110-PN (Ext msg)</td>
<td>Can be changed: U, T</td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td>Calculated: -</td>
</tr>
<tr>
<td>P-Group: Messages</td>
<td>Dynamic index: DDS, p0180</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Units group: 7_1</td>
</tr>
<tr>
<td>Min</td>
<td>0.00 [Nm]</td>
</tr>
<tr>
<td>Max</td>
<td>20000000.00 [Nm]</td>
</tr>
</tbody>
</table>

**Description:**
Sets the speed/torque/velocity/force envelope curve for the load monitoring.

**Dependency:**
The following applies: p2188 < p2187

**Refer to:**
p2183, p2187

**Note:**
The lower envelope curve is defined by p2186, p2188 and p2190.

#### p2189[0...n]
**Load monitoring torque threshold 3, upper / M_thresh 3 upper**

<table>
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<tr>
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<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN (Ext msg), SERVO_S110-DP (Ext msg), SERVO_S110-PN (Ext msg)</td>
<td>Can be changed: U, T</td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td>Calculated: -</td>
</tr>
<tr>
<td>P-Group: Messages</td>
<td>Dynamic index: DDS, p0180</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Units group: 7_1</td>
</tr>
<tr>
<td>Min</td>
<td>0.00 [Nm]</td>
</tr>
<tr>
<td>Max</td>
<td>20000000.00 [Nm]</td>
</tr>
</tbody>
</table>

**Description:**
Sets the speed/torque/velocity/force envelope curve for the load monitoring.

**Dependency:**
The following applies: p2189 > p2190

**Refer to:**
p2184, p2190

**Note:**
The upper envelope curve is defined by p2185, p2187 and p2189.

#### p2190[0...n]
**Load monitoring torque threshold 3, lower / M_thresh 3 lower**

<table>
<thead>
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<th>Details</th>
<th>Value</th>
</tr>
</thead>
<tbody>
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<td>Can be changed: U, T</td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td>Calculated: -</td>
</tr>
<tr>
<td>P-Group: Messages</td>
<td>Dynamic index: DDS, p0180</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Units group: 7_1</td>
</tr>
<tr>
<td>Min</td>
<td>0.00 [Nm]</td>
</tr>
<tr>
<td>Max</td>
<td>20000000.00 [Nm]</td>
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**Description:**
Sets the speed/torque/velocity/force envelope curve for the load monitoring.

**Dependency:**
The following applies: p2190 < p2189

**Refer to:**
p2184, p2189

**Note:**
The lower envelope curve is defined by p2186, p2188 and p2190.

#### p2192[0...n]
**Load monitoring delay time / Load monit t_del**

<table>
<thead>
<tr>
<th>Details</th>
<th>Value</th>
</tr>
</thead>
<tbody>
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<td>Can be changed: U, T</td>
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<td>Calculated: -</td>
</tr>
<tr>
<td>P-Group: Messages</td>
<td>Dynamic index: DDS, p0180</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Units group: -</td>
</tr>
<tr>
<td>Min</td>
<td>0.00 [s]</td>
</tr>
<tr>
<td>Max</td>
<td>65.00 [s]</td>
</tr>
</tbody>
</table>

**Description:**
Sets the delay time to evaluate the load monitoring.
**p2194[0...n]**  Torque threshold value 2 / M\_thresh val 2  
**SERVO\_S110-CAN, SERVO\_S110-DP, SERVO\_S110-PN**  
- **Can be changed:** U, T  
- **Calculated:** CALC\_MOD\_LIM\_REF  
- **Access level:** 2  
- **Data type:** FloatingPoint32  
- **Dynamic index:** DDS, p0180  
- **Func. diagram:** 8012  
- **P-Group:** Messages  
- **Units group:** -  
- **Unit selection:** -  
- **Not for motor type:** -  
- **Scaling:** -  
- **Expert list:** 1  
- **Min:** 0.00 [%]  
- **Max:** 100.00 [%]  
- **Factory setting:** 90.00 [%]  

**Description:**  
Sets the torque threshold value for the message "Torque utilization < torque threshold value 2" (BO: r2199.11).  
The message "torque setpoint < p2174" (BO: r2198.10) and "torque utilization < p2194" (BO: r2199.11) are only evaluated after the run-up and the delay time has expired.  

**Dependency:**  
Refer to: r0033, p2195, r2199  

---  

**p2195[0...n]**  Torque utilization switch-off delay / M\_util t\_off  
**SERVO\_S110-CAN, SERVO\_S110-DP, SERVO\_S110-PN**  
- **Can be changed:** U, T  
- **Calculated:** -  
- **Access level:** 2  
- **Data type:** FloatingPoint32  
- **Dynamic index:** DDS, p0180  
- **Func. diagram:** 8012  
- **P-Group:** Messages  
- **Units group:** -  
- **Unit selection:** -  
- **Not for motor type:** -  
- **Scaling:** -  
- **Expert list:** 1  
- **Min:** 0.0 [ms]  
- **Max:** 1000.00 [ms]  
- **Factory setting:** 800.00 [ms]  

**Description:**  
Sets the switch-off delay time for the negated signal "run-up completed".  
The message "torque setpoint < p2174" (BO: r2198.10) and "torque utilization < p2194" (BO: r2199.11) are only evaluated after the run-up and the delay time has expired.  

**Dependency:**  
Refer to: p2174, p2194  

---  

**p2196[0...n]**  Torque utilization scaling / M\_util scal  
**SERVO\_S110-CAN, SERVO\_S110-DP, SERVO\_S110-PN**  
- **Can be changed:** C2(1, 3), U, T  
- **Calculated:** -  
- **Access level:** 1  
- **Data type:** FloatingPoint32  
- **Dynamic index:** DDS, p0180  
- **Func. diagram:** -  
- **P-Group:** Motor  
- **Units group:** -  
- **Unit selection:** -  
- **Not for motor type:** -  
- **Scaling:** -  
- **Expert list:** 1  
- **Min:** 0.00 [%]  
- **Max:** 1000.00 [%]  
- **Factory setting:** 100.00 [%]  

**Description:**  
Sets the scaling factor for torque utilization (r0033).  

---  

**r2197.1...13**  CO/BO: Status word monitoring 1 / ZSW monitor 1  
**SERVO\_S110-CAN, SERVO\_S110-DP, SERVO\_S110-PN**  
- **Can be changed:** -  
- **Calculated:** -  
- **Access level:** 2  
- **Data type:** Unsigned16  
- **Dynamic index:** -  
- **Func. diagram:** 1530, 2534  
- **P-Group:** Messages  
- **Units group:** -  
- **Unit selection:** -  
- **Not for motor type:** -  
- **Scaling:** -  
- **Expert list:** 1  
- **Min:** -  
- **Max:** -  
- **Factory setting:** -  

**Description:**  
Displays the first status word for monitoring functions.  

**Bit field:**  
<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td></td>
<td></td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>02</td>
<td></td>
<td></td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>03</td>
<td>n_act &gt;= 0</td>
<td>Yes</td>
<td>No</td>
<td>8011</td>
</tr>
<tr>
<td>06</td>
<td>[n_act] &gt; n_max</td>
<td>Yes</td>
<td>No</td>
<td>8010</td>
</tr>
<tr>
<td>07</td>
<td>Speed setp - act val deviation in tolerance</td>
<td>Yes</td>
<td>No</td>
<td>8011</td>
</tr>
<tr>
<td>13</td>
<td>[n_act] &gt; n_max error</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
</tbody>
</table>

**Note:**  
Re bit 01, 02:  
The threshold value is set in p2155 and the hysteresis in p2140.
Re bit 03:
The hysteresis is set in p2150.
Re bit 06:
The hysteresis is set in p2162.
Re bit 07:
The threshold value is set in p2163 and the hysteresis is set in p2164.

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>04</td>
<td>([n_{\text{set}}] &lt; p2161)</td>
<td>Yes</td>
<td>No</td>
<td>8010</td>
</tr>
<tr>
<td>05</td>
<td>(n_{\text{set}} &gt; 0)</td>
<td>Yes</td>
<td>No</td>
<td>8010</td>
</tr>
<tr>
<td>06</td>
<td>Motor stalled</td>
<td>Yes</td>
<td>No</td>
<td>8012</td>
</tr>
<tr>
<td>10</td>
<td>([M_{\text{set}}] &lt; \text{torque threshold value 1})</td>
<td>Yes</td>
<td>No</td>
<td>8012</td>
</tr>
<tr>
<td>11</td>
<td>Load monitoring signals an alarm</td>
<td>Yes</td>
<td>No</td>
<td>8013</td>
</tr>
<tr>
<td>12</td>
<td>Load monitoring signals a fault condition</td>
<td>Yes</td>
<td>No</td>
<td>8013</td>
</tr>
</tbody>
</table>

Note:
Re bit 10:
The torque threshold value 1 is set in p2174.
Re bit 12:
This bit is reset after the fault cause disappears, even if the fault itself is still present.

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>([n_{\text{act}}] &lt; \text{speed threshold value 3})</td>
<td>Yes</td>
<td>No</td>
<td>8010</td>
</tr>
<tr>
<td>01</td>
<td>for comparison value reached or exceeded</td>
<td>Yes</td>
<td>No</td>
<td>8010</td>
</tr>
<tr>
<td>04</td>
<td>Speed setp - act val deviation in tolerance(t_{\text{on}})</td>
<td>Yes</td>
<td>No</td>
<td>8010</td>
</tr>
<tr>
<td>05</td>
<td>Ramp-up/ramp-down completed</td>
<td>Yes</td>
<td>No</td>
<td>8010</td>
</tr>
<tr>
<td>06</td>
<td>Current below the zero current threshold</td>
<td>Yes</td>
<td>No</td>
<td>8012</td>
</tr>
<tr>
<td>11</td>
<td>Torque utilization &lt; torque threshold value 2</td>
<td>Yes</td>
<td>No</td>
<td>8012</td>
</tr>
</tbody>
</table>

Note:
Re bit 00:
The speed threshold value 3 is set in p2161.
Re bit 01:
The comparison value is set in p2141. We recommend setting the hysteresis (p2142) for canceling the bit to a value lower than that in p2141. Otherwise, the bit will never be reset.
Re bit 11:
The torque threshold value 2 is set in p2194.
### p2200[0...n]

**BI: Technology controller enable / Tec_ctrl enable**

| SERVO_S110-CAN (Tech_ctrl), SERVO_S110-DP (Tech_ctrl), SERVO_S110-PN (Tech_ctrl) | Can be changed: T | Calculated: - | Access level: 2 |
| Data type: Unsigned32 / Binary | Dynamic index: CDS, p0170 | Units group: - | Func. diagram: 7958 |
| P-Group: Technology | Units group: - | | Unit selection: - |
| Not for motor type: - | Scaling: - | Expert list: 1 |

**Min** | **Max** | **Factory setting**
--- | --- | ---
- | - | 0

**Description:**
Sets the signal source to switch in/switch out the technology controller. The technology controller is switched in with a 1 signal.

**Dependency:**
Refer to: p2220, p2221, p2222, p2223, r2224, r2229

**Notice:**
A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.

### p2201[0...n]

**CO: Technology controller, fixed value 1 / Tec_ctr fix val 1**

| SERVO_S110-CAN (Tech_ctrl), SERVO_S110-DP (Tech_ctrl), SERVO_S110-PN (Tech_ctrl) | Can be changed: U, T | Calculated: - | Access level: 2 |
| Data type: FloatingPoint32 | Dynamic index: DDS, p0180 | Units group: 9_1 | Func. diagram: 7950 |
| P-Group: Technology | Scaling: PERCENT | Unit selection: p0595 |
| Not for motor type: - | Expert list: 1 |

**Min** | **Max** | **Factory setting**
--- | --- | ---
-200.00 [%] | 200.00 [%] | 10.00 [%]

**Description:**
Sets the value for fixed value 1 of the technology controller.

**Dependency:**
Refer to: p2220, p2221, p2222, p2223, r2224, r2229

**Notice:**
A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.

### p2202[0...n]

**CO: Technology controller, fixed value 2 / Tec_ctr fix val 2**

| SERVO_S110-CAN (Tech_ctrl), SERVO_S110-DP (Tech_ctrl), SERVO_S110-PN (Tech_ctrl) | Can be changed: U, T | Calculated: - | Access level: 2 |
| Data type: FloatingPoint32 | Dynamic index: DDS, p0180 | Units group: 9_1 | Func. diagram: 7950 |
| P-Group: Technology | Scaling: PERCENT | Unit selection: p0595 |
| Not for motor type: - | Expert list: 1 |

**Min** | **Max** | **Factory setting**
--- | --- | ---
-200.00 [%] | 200.00 [%] | 20.00 [%]

**Description:**
Sets the value for fixed value 2 of the technology controller.

**Dependency:**
Refer to: p2220, p2221, p2222, p2223, r2224, r2229

**Notice:**
A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.

### p2203[0...n]

**CO: Technology controller, fixed value 3 / Tec_ctr fix val 3**

| SERVO_S110-CAN (Tech_ctrl), SERVO_S110-DP (Tech_ctrl), SERVO_S110-PN (Tech_ctrl) | Can be changed: U, T | Calculated: - | Access level: 2 |
| Data type: FloatingPoint32 | Dynamic index: DDS, p0180 | Units group: 9_1 | Func. diagram: 7950 |
| P-Group: Technology | Scaling: PERCENT | Unit selection: p0595 |
| Not for motor type: - | Expert list: 1 |

**Min** | **Max** | **Factory setting**
--- | --- | ---
-200.00 [%] | 200.00 [%] | 30.00 [%]

**Description:**
Sets the value for fixed value 3 of the technology controller.

**Dependency:**
Refer to: p2220, p2221, p2222, p2223, r2224, r2229

**Notice:**
A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.
### List of Parameters

**Parameter p2204[0...n]**

**CO: Technology controller, fixed value 4 / Tec_ctr fix val 4**

<table>
<thead>
<tr>
<th>SERVO_S110-CAN (Tech_ctrl)</th>
<th>SERVO_S110-DP (Tech_ctrl)</th>
<th>SERVO_S110-PN (Tech_ctrl)</th>
</tr>
</thead>
<tbody>
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<tr>
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<td></td>
</tr>
<tr>
<td>P-Group: Technology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>-200.00 [%]</td>
<td>200.00 [%]</td>
</tr>
</tbody>
</table>

**Description:**
Sets the value for fixed value 4 of the technology controller.

**Dependency:**
Refer to: p2220, p2221, p2222, p2223, r2224, r2229

**Notice:**
A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.

**Parameter p2205[0...n]**

**CO: Technology controller, fixed value 5 / Tec_ctr fix val 5**

<table>
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<tr>
<th>SERVO_S110-CAN (Tech_ctrl)</th>
<th>SERVO_S110-DP (Tech_ctrl)</th>
<th>SERVO_S110-PN (Tech_ctrl)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed: U, T</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P-Group: Technology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>-200.00 [%]</td>
<td>200.00 [%]</td>
</tr>
</tbody>
</table>

**Description:**
Sets the value for fixed value 5 of the technology controller.

**Dependency:**
Refer to: p2220, p2221, p2222, p2223, r2224, r2229

**Notice:**
A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.

**Parameter p2206[0...n]**

**CO: Technology controller, fixed value 6 / Tec_ctr fix val 6**

<table>
<thead>
<tr>
<th>SERVO_S110-CAN (Tech_ctrl)</th>
<th>SERVO_S110-DP (Tech_ctrl)</th>
<th>SERVO_S110-PN (Tech_ctrl)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed: U, T</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P-Group: Technology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>-200.00 [%]</td>
<td>200.00 [%]</td>
</tr>
</tbody>
</table>

**Description:**
Sets the value for fixed value 6 of the technology controller.

**Dependency:**
Refer to: p2220, p2221, p2222, p2223, r2224, r2229

**Notice:**
A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.

**Parameter p2207[0...n]**

**CO: Technology controller, fixed value 7 / Tec_ctr fix val 7**

<table>
<thead>
<tr>
<th>SERVO_S110-CAN (Tech_ctrl)</th>
<th>SERVO_S110-DP (Tech_ctrl)</th>
<th>SERVO_S110-PN (Tech_ctrl)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed: U, T</td>
<td></td>
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<tr>
<td>Data type: FloatingPoint32</td>
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<td></td>
</tr>
<tr>
<td>P-Group: Technology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>-200.00 [%]</td>
<td>200.00 [%]</td>
</tr>
</tbody>
</table>

**Description:**
Sets the value for fixed value 7 of the technology controller.

**Dependency:**
Refer to: p2220, p2221, p2222, p2223, r2224, r2229

**Notice:**
A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.
Parameter

List of parameters

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
<th>Fixed Value</th>
<th>Technology Controller</th>
<th>Access</th>
<th>Calculated</th>
<th>Dynamic Index</th>
<th>Unit Selection</th>
<th>Expert List</th>
<th>Min</th>
<th>Max</th>
<th>Factory Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sets the value for fixed value 8 of the technology controller.</td>
<td>FloatingPoint32</td>
<td>8</td>
<td>Technology</td>
<td>2</td>
<td>-</td>
<td>DDS, p0180</td>
<td>9_1</td>
<td>1</td>
<td>-200.00 [%]</td>
<td>200.00 [%]</td>
<td>80.00 [%]</td>
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<tr>
<td>A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sets the value for fixed value 9 of the technology controller.</td>
<td>FloatingPoint32</td>
<td>9</td>
<td>Technology</td>
<td>2</td>
<td>-</td>
<td>DDS, p0180</td>
<td>9_1</td>
<td>1</td>
<td>-200.00 [%]</td>
<td>200.00 [%]</td>
<td>90.00 [%]</td>
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<tr>
<td>A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sets the value for fixed value 10 of the technology controller.</td>
<td>FloatingPoint32</td>
<td>10</td>
<td>Technology</td>
<td>2</td>
<td>-</td>
<td>DDS, p0180</td>
<td>9_1</td>
<td>1</td>
<td>-200.00 [%]</td>
<td>200.00 [%]</td>
<td>100.00 [%]</td>
</tr>
<tr>
<td>A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sets the value for fixed value 11 of the technology controller.</td>
<td>FloatingPoint32</td>
<td>11</td>
<td>Technology</td>
<td>2</td>
<td>-</td>
<td>DDS, p0180</td>
<td>9_1</td>
<td>1</td>
<td>-200.00 [%]</td>
<td>200.00 [%]</td>
<td>110.00 [%]</td>
</tr>
<tr>
<td>A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.</td>
<td></td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>
### List of parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Notice</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>p2212[0...n]</strong> CO: Technology controller, fixed value 12 / Tec_ctr fix val 12</td>
<td>Sets the value for fixed value 12 of the technology controller.</td>
<td>Refer to: p2220, p2221, p2222, p2223, r2224, r2229</td>
<td>A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.</td>
</tr>
<tr>
<td>SERVO_S110-CAN (Tech_ctrl), SERVO_S110-DP (Tech_ctrl), SERVO_S110-PN (Tech_ctrl)</td>
<td>Can be changed: U, T</td>
<td>Calculated: -</td>
<td>Access level: 2</td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td>Dynamic index: DDS, p0180</td>
<td>Units group: 9_1</td>
<td>Func. diagram: 7950</td>
</tr>
<tr>
<td>P-Group: Technology</td>
<td>Access level: 2</td>
<td>Unit selection: p0595</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: PERCENT</td>
<td>Dynamic index: DDS, p0180</td>
<td>Units group: 9_1</td>
</tr>
<tr>
<td>Min: -200.00 [%]</td>
<td>Max: 200.00 [%]</td>
<td>Access level: 2</td>
<td>Unit selection: p0595</td>
</tr>
<tr>
<td>Factory setting: 120.00 [%]</td>
<td>Factory setting: 130.00 [%]</td>
<td>Access level: 2</td>
<td>Unit selection: p0595</td>
</tr>
<tr>
<td><strong>p2213[0...n]</strong> CO: Technology controller, fixed value 13 / Tec_ctr fix val 13</td>
<td>Sets the value for fixed value 13 of the technology controller.</td>
<td>Refer to: p2220, p2221, p2222, p2223, r2224, r2229</td>
<td>A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.</td>
</tr>
<tr>
<td>SERVO_S110-CAN (Tech_ctrl), SERVO_S110-DP (Tech_ctrl), SERVO_S110-PN (Tech_ctrl)</td>
<td>Can be changed: U, T</td>
<td>Calculated: -</td>
<td>Access level: 2</td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td>Dynamic index: DDS, p0180</td>
<td>Units group: 9_1</td>
<td>Func. diagram: 7950</td>
</tr>
<tr>
<td>P-Group: Technology</td>
<td>Access level: 2</td>
<td>Unit selection: p0595</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: PERCENT</td>
<td>Dynamic index: DDS, p0180</td>
<td>Units group: 9_1</td>
</tr>
<tr>
<td>Min: -200.00 [%]</td>
<td>Max: 200.00 [%]</td>
<td>Access level: 2</td>
<td>Unit selection: p0595</td>
</tr>
<tr>
<td>Factory setting: 140.00 [%]</td>
<td>Factory setting: 150.00 [%]</td>
<td>Access level: 2</td>
<td>Unit selection: p0595</td>
</tr>
<tr>
<td><strong>p2214[0...n]</strong> CO: Technology controller, fixed value 14 / Tec_ctr fix val 14</td>
<td>Sets the value for fixed value 14 of the technology controller.</td>
<td>Refer to: p2220, p2221, p2222, p2223, r2224, r2229</td>
<td>A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.</td>
</tr>
<tr>
<td>SERVO_S110-CAN (Tech_ctrl), SERVO_S110-DP (Tech_ctrl), SERVO_S110-PN (Tech_ctrl)</td>
<td>Can be changed: U, T</td>
<td>Calculated: -</td>
<td>Access level: 2</td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td>Dynamic index: DDS, p0180</td>
<td>Units group: 9_1</td>
<td>Func. diagram: 7950</td>
</tr>
<tr>
<td>P-Group: Technology</td>
<td>Access level: 2</td>
<td>Unit selection: p0595</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: PERCENT</td>
<td>Dynamic index: DDS, p0180</td>
<td>Units group: 9_1</td>
</tr>
<tr>
<td>Min: -200.00 [%]</td>
<td>Max: 200.00 [%]</td>
<td>Access level: 2</td>
<td>Unit selection: p0595</td>
</tr>
<tr>
<td>Factory setting: 140.00 [%]</td>
<td>Factory setting: 150.00 [%]</td>
<td>Access level: 2</td>
<td>Unit selection: p0595</td>
</tr>
<tr>
<td><strong>p2215[0...n]</strong> CO: Technology controller, fixed value 15 / Tec_ctr fix val 15</td>
<td>Sets the value for fixed value 15 of the technology controller.</td>
<td>Refer to: p2220, p2221, p2222, p2223, r2224, r2229</td>
<td>A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.</td>
</tr>
<tr>
<td>SERVO_S110-CAN (Tech_ctrl), SERVO_S110-DP (Tech_ctrl), SERVO_S110-PN (Tech_ctrl)</td>
<td>Can be changed: U, T</td>
<td>Calculated: -</td>
<td>Access level: 2</td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td>Dynamic index: DDS, p0180</td>
<td>Units group: 9_1</td>
<td>Func. diagram: 7950</td>
</tr>
<tr>
<td>P-Group: Technology</td>
<td>Access level: 2</td>
<td>Unit selection: p0595</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: PERCENT</td>
<td>Dynamic index: DDS, p0180</td>
<td>Units group: 9_1</td>
</tr>
<tr>
<td>Min: -200.00 [%]</td>
<td>Max: 200.00 [%]</td>
<td>Access level: 2</td>
<td>Unit selection: p0595</td>
</tr>
<tr>
<td>Factory setting: 150.00 [%]</td>
<td>Factory setting: 150.00 [%]</td>
<td>Access level: 2</td>
<td>Unit selection: p0595</td>
</tr>
</tbody>
</table>
### Parameter List of parameters

<table>
<thead>
<tr>
<th>p2216[0...n]</th>
<th>Technology controller fixed value selection method / Tec_ctr FixVal sel</th>
</tr>
</thead>
</table>
| SERVO_S110-CAN (Tech_ctrl), SERVO_S110-DP (Tech_ctrl), SERVO_S110-PN (Tech_ctrl) | Can be changed: T  
Data type: Integer16  
P-Group: Technology  
Not for motor type: -  
Min: 1  
Max: 2  
Factory setting: 2 | Calculated: -  
Dynamic index: DDS, p0180  
Units group: -  
Scaling: -  
Access level: 2 |

**Description:** Selects the method that can be used to select the fixed setpoints.

**Value:**
1: Fixed value selection direct  
2: Fixed value selection binary

<table>
<thead>
<tr>
<th>p2220[0...n]</th>
<th>BI: Technology controller fixed value selection bit 0 / Tec_ctrl sel bit 0</th>
</tr>
</thead>
</table>
| SERVO_S110-CAN (Tech_ctrl), SERVO_S110-DP (Tech_ctrl), SERVO_S110-PN (Tech_ctrl) | Can be changed: T  
Data type: Unsigned32 / Binary  
P-Group: Commands  
Not for motor type: -  
Min: -  
Max: -  
Factory setting: 0 | Calculated: -  
Dynamic index: CDS, p0170  
Units group: -  
Scaling: -  
Access level: 3 |

**Description:** Sets the signal source to select the fixed value of the technology controller.

**Dependency:** Refer to: p2221, p2222, p2223

<table>
<thead>
<tr>
<th>p2221[0...n]</th>
<th>BI: Technology controller fixed value selection bit 1 / Tec_ctrl sel bit 1</th>
</tr>
</thead>
</table>
| SERVO_S110-CAN (Tech_ctrl), SERVO_S110-DP (Tech_ctrl), SERVO_S110-PN (Tech_ctrl) | Can be changed: T  
Data type: Unsigned32 / Binary  
P-Group: Commands  
Not for motor type: -  
Min: -  
Max: -  
Factory setting: 0 | Calculated: -  
Dynamic index: CDS, p0170  
Units group: -  
Scaling: -  
Access level: 3 |

**Description:** Sets the signal source to select the fixed value of the technology controller.

**Dependency:** Refer to: p2220, p2222, p2223

<table>
<thead>
<tr>
<th>p2222[0...n]</th>
<th>BI: Technology controller fixed value selection bit 2 / Tec_ctrl sel bit 2</th>
</tr>
</thead>
</table>
| SERVO_S110-CAN (Tech_ctrl), SERVO_S110-DP (Tech_ctrl), SERVO_S110-PN (Tech_ctrl) | Can be changed: T  
Data type: Unsigned32 / Binary  
P-Group: Commands  
Not for motor type: -  
Min: -  
Max: -  
Factory setting: 0 | Calculated: -  
Dynamic index: CDS, p0170  
Units group: -  
Scaling: -  
Access level: 3 |

**Description:** Sets the signal source to select the fixed value of the technology controller.

**Dependency:** Refer to: p2220, p2221, p2223
<table>
<thead>
<tr>
<th>Parameter</th>
<th>BI: Technology controller fixed value selection bit 3 / Tec_ctrl sel bit 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>p2223[0...n]</td>
<td>Can be changed: T  Calculated: -  Access level: 3</td>
</tr>
<tr>
<td>SERVO_S110-CAN (Tech_ctrl), SERVO_S110-DP (Tech_ctrl), SERVO_S110-PN (Tech_ctrl)</td>
<td>Data type: Unsigned32 / Binary  Dynamic index: CDS, p0170  Func. diagram: 7950</td>
</tr>
<tr>
<td>P-Group: Commands</td>
<td>Units group: -  Unit selection: -  Expert list: 1</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Min -  Max -  Factory setting 0</td>
</tr>
<tr>
<td>Description:</td>
<td>Sets the signal source to select the fixed value of the technology controller.</td>
</tr>
<tr>
<td>Dependency:</td>
<td>Refer to: p2220, p2221, p2222</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>CO: Technology controller, fixed value effective / Tec_ctr FixVal eff</th>
</tr>
</thead>
<tbody>
<tr>
<td>r2224</td>
<td>Can be changed: -  Calculated: -  Access level: 2</td>
</tr>
<tr>
<td>SERVO_S110-CAN (Tech_ctrl), SERVO_S110-DP (Tech_ctrl), SERVO_S110-PN (Tech_ctrl)</td>
<td>Data type: FloatingPoint32  Dynamic index: -  Func. diagram: 7950</td>
</tr>
<tr>
<td>P-Group: Technology</td>
<td>Units group: 9_1  Unit selection: p0595  Expert list: 1</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Min - [%]  Max - [%]  Factory setting - [%]</td>
</tr>
<tr>
<td>Description:</td>
<td>Displays the selected and effective fixed value of the technology controller.</td>
</tr>
<tr>
<td>Dependency:</td>
<td>Refer to: r2229</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>CO/BO: Technology controller fixed value selection status word / Tec_ctr FixVal ZSW</th>
</tr>
</thead>
<tbody>
<tr>
<td>r2225.0</td>
<td>Can be changed: -  Calculated: -  Access level: 3</td>
</tr>
<tr>
<td>SERVO_S110-CAN (Tech_ctrl), SERVO_S110-DP (Tech_ctrl), SERVO_S110-PN (Tech_ctrl)</td>
<td>Data type: Unsigned16  Dynamic index: -  Func. diagram: -</td>
</tr>
<tr>
<td>P-Group: Technology</td>
<td>Units group: -  Unit selection: -  Expert list: 1</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Min -  Max -  Factory setting</td>
</tr>
<tr>
<td>Description:</td>
<td>Displays the status word for the fixed value selection of the technology controller.</td>
</tr>
<tr>
<td>Bit field:</td>
<td>Bit Signal name 1 signal 0 signal 0[%] FP</td>
</tr>
<tr>
<td>00</td>
<td>Technology controller fixed value selected Yes No</td>
</tr>
<tr>
<td>0</td>
<td>7950, 7951</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Technology controller number actual / Tec_ctr No. act</th>
</tr>
</thead>
<tbody>
<tr>
<td>r2229</td>
<td>Can be changed: -  Calculated: -  Access level: 2</td>
</tr>
<tr>
<td>SERVO_S110-CAN (Tech_ctrl), SERVO_S110-DP (Tech_ctrl), SERVO_S110-PN (Tech_ctrl)</td>
<td>Data type: Unsigned32  Dynamic index: -  Func. diagram: 7950</td>
</tr>
<tr>
<td>P-Group: Technology</td>
<td>Units group: -  Unit selection: -  Expert list: 1</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Min -  Max -  Factory setting</td>
</tr>
<tr>
<td>Description:</td>
<td>Displays the number of the selected fixed setpoint of the technology controller.</td>
</tr>
<tr>
<td>Dependency:</td>
<td>Refer to: r2224</td>
</tr>
</tbody>
</table>
### Parameter List of parameters

#### p2230[0...n]
**Technology controller motorized potentiometer configuration / Tec_ctr mop config**

<table>
<thead>
<tr>
<th>Bit field</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Data save active</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>02</td>
<td>Initial rounding-off active</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>03</td>
<td>Non-volatile data save active for p2230.0 = 1</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>04</td>
<td>Ramp-function generator always active</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
</tbody>
</table>

**Description:**
Sets the configuration for the motorized potentiometer of the technology controller.

**Dependency:**
Refer to: r2231, p2240

**Note:**
- Re bit 00: The setpoint for the motorized potentiometer is not saved and after ON is entered using p2240.
- Re bit 02: The setpoint for the motorized potentiometer is saved and after ON is entered using r2231. In order to save in a non-volatile fashion, bit 03 should be set to 1.
- Re bit 04: When the bit is set, the ramp-function generator is computed independent of the pulse enable. The actual output value of the motorized potentiometer is always in r2250.

#### r2231
**Technology controller motorized potentiometer setpoint memory / Tec_ctr mop mem**

<table>
<thead>
<tr>
<th>Bit field</th>
<th>Signal name</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Data save active</td>
<td>-</td>
<td>-</td>
<td>0000 0100 bin</td>
</tr>
</tbody>
</table>

**Description:**
Displays the setpoint memory for the motorized potentiometer of the technology controller.

**Dependency:**
Refer to: p2230
### List of parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>p2235[0...n]</strong></td>
<td>BI: Technology controller motorized potentiometer raise setpoint / Tec_ctrl mop raise</td>
<td>Sets the signal source to continually increase the setpoint for the motorized potentiometer of the technology controller. The setpoint change (CO: r2250) depends on the set ramp-up time (p2247) and the duration of the signal that is present (BI: p2235).</td>
</tr>
<tr>
<td><strong>p2236[0...n]</strong></td>
<td>BI: Technology controller motorized potentiometer lower setpoint / Tec_ctrl mop lower</td>
<td>Sets the signal source to continually reduce the setpoint for the motorized potentiometer of the technology controller. The setpoint change (CO: r2250) depends on the set ramp-down time (p2248) and the duration of the signal that is present (BI: p2236).</td>
</tr>
<tr>
<td><strong>p2237[0...n]</strong></td>
<td>Technology controller motorized potentiometer maximum value / Tec_ctrl mop max</td>
<td>Sets the maximum value for the motorized potentiometer of the technology controller.</td>
</tr>
<tr>
<td><strong>p2238[0...n]</strong></td>
<td>Technology controller motorized potentiometer minimum value / Tec_ctrl mop min</td>
<td>Sets the minimum value for the motorized potentiometer of the technology controller.</td>
</tr>
</tbody>
</table>

**Parameter details:**
- **SERVO_S110-CAN** (Tech_ctrl), **SERVO_S110-DP** (Tech_ctrl), **SERVO_S110-PN** (Tech_ctrl)
- **Can be changed:** T
- **Data type:** Unsigned32 / Binary
- **P-Group:** Commands
- **Not for motor type:** -
- **Min:** -
- **Max:** 0
- **Factory setting:**
- **Calculation:**
  - **Dynamic index:** CDS, p0170
  - **Units group:** -
  - **Scaling:** -
  - **Expert list:** 1
- **Access level:** 3
- **Func. diagram:** 7954

**Description:**
Sets the signal source to continually increase the setpoint for the motorized potentiometer of the technology controller.

**Dependency:**
Refer to: p2236

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>p2237[0...n]</strong></td>
<td>Technology controller motorized potentiometer maximum value / Tec_ctrl mop max</td>
<td></td>
</tr>
<tr>
<td><strong>p2238[0...n]</strong></td>
<td>Technology controller motorized potentiometer minimum value / Tec_ctrl mop min</td>
<td></td>
</tr>
</tbody>
</table>

**Parameter details:**
- **SERVO_S110-CAN** (Tech_ctrl), **SERVO_S110-DP** (Tech_ctrl), **SERVO_S110-PN** (Tech_ctrl)
- **Can be changed:** U, T
- **Data type:** FloatingPoint32
- **P-Group:** Technology
- **Not for motor type:** -
- **Min:** -200.00 [%]
- **Max:** 200.00 [%]
- **Factory setting:** 100.00 [%]
- **Calculation:**
  - **Dynamic index:** DDS, p0180
  - **Units group:** 9_1
  - **Scaling:** -
  - **Expert list:** 1
- **Access level:** 2
- **Func. diagram:** 7954

**Description:**
Sets the maximum value for the motorized potentiometer of the technology controller.

**Dependency:**
Refer to: p2238

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>p2238[0...n]</strong></td>
<td>Technology controller motorized potentiometer minimum value / Tec_ctrl mop min</td>
<td></td>
</tr>
</tbody>
</table>

**Parameter details:**
- **SERVO_S110-CAN** (Tech_ctrl), **SERVO_S110-DP** (Tech_ctrl), **SERVO_S110-PN** (Tech_ctrl)
- **Can be changed:** U, T
- **Data type:** FloatingPoint32
- **P-Group:** Technology
- **Not for motor type:** -
- **Min:** -200.00 [%]
- **Max:** 200.00 [%]
- **Factory setting:** -100.00 [%]
- **Calculation:**
  - **Dynamic index:** DDS, p0180
  - **Units group:** 9_1
  - **Scaling:** -
  - **Expert list:** 1
- **Access level:** 2
- **Func. diagram:** 7954

**Description:**
Sets the minimum value for the motorized potentiometer of the technology controller.

**Dependency:**
Refer to: p2237
### List of parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>p2240[0...n]</strong> Technology controller motorized potentiometer starting value / Tec_ctrl mop start</td>
<td>Sets the starting value for the motorized potentiometer of the technology controller. For p2230.0 = 0, this setpoint is entered after ON.</td>
<td>Refer to: p2230</td>
</tr>
<tr>
<td>SERVO_S110-CAN (Tech_ctrl), SERVO_S110-DP (Tech_ctrl), SERVO_S110-PN (Tech_ctrl)</td>
<td>Can be changed: U, T</td>
<td>Calculated: -</td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td>Dynamic index: DDS, p0180</td>
<td>Units group: 9_1</td>
</tr>
<tr>
<td>P-Group: Technology</td>
<td>Expert list: 1</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td></td>
</tr>
<tr>
<td>Min -200.00 [%]</td>
<td>Max 200.00 [%]</td>
<td>Factory setting 0.00 [%]</td>
</tr>
</tbody>
</table>

| **r2245** CO: Technology controller mot. potentiometer setpoint before RFG / Tec_ctr mop befRFG | Sets the effective setpoint in front of the internal motorized potentiometer ramp-function generator of the technology controller. | Refer to: r2250 |
| SERVO_S110-CAN (Tech_ctrl), SERVO_S110-DP (Tech_ctrl), SERVO_S110-PN (Tech_ctrl) | Can be changed: - | Calculated: - | Access level: 2 |
| Data type: FloatingPoint32 | Dynamic index: - | Units group: 9_1 | Unit selection: p0595 |
| P-Group: Technology | Scaling: PERCENT | Expert list: 1 | |
| Not for motor type: - | Min - [%] | Max - [%] | Factory setting - [%] |

| **p2247[0...n]** Technology controller motorized potentiometer ramp-up time / Tec_ctr mop t_r-up | Sets the ramp-up time for the internal ramp-function generator for the motorized potentiometer of the technology controller. | Refer to: p2248 |
| SERVO_S110-CAN (Tech_ctrl), SERVO_S110-DP (Tech_ctrl), SERVO_S110-PN (Tech_ctrl) | Can be changed: U, T | Calculated: - | Access level: 2 |
| Data type: FloatingPoint32 | Dynamic index: DDS, p0180 | Units group: - | Unit selection: - |
| P-Group: Technology | Scaling: - | Expert list: 1 | |
| Not for motor type: - | Min 0.0 [s] | Max 1000.0 [s] | Factory setting 10.0 [s] |

| **p2248[0...n]** Technology controller motorized potentiometer ramp-down time / Tec_ctrMop t_rdown | Sets the ramp-down time for the internal ramp-function generator for the motorized potentiometer of the technology controller. When the initial rounding-off is activated (p2230.2 = 1) the ramp-up is correspondingly extended. | Refer to: p2247 |
| SERVO_S110-CAN (Tech_ctrl), SERVO_S110-DP (Tech_ctrl), SERVO_S110-PN (Tech_ctrl) | Can be changed: U, T | Calculated: - | Access level: 2 |
| Data type: FloatingPoint32 | Dynamic index: DDS, p0180 | Units group: - | Unit selection: - |
| P-Group: Technology | Scaling: - | Expert list: 1 | |
| Not for motor type: - | Min 0.0 [s] | Max 1000.0 [s] | Factory setting 10.0 [s] |
### r2250
**CO: Technology controller motorized potentiometer setpoint after RFG / Tec_ctr mop aftRFG**

- **SERVO_S110-CAN (Tech_ctrl)**
- **SERVO_S110-DP (Tech_ctrl)**
- **SERVO_S110-PN (Tech_ctrl)**

- **Can be changed:** -
- **Data type:** FloatingPoint32
- **P-Group:** Technology
- **Not for motor type:** -

- **Description:** Displays the effective setpoint after the internal ramp-function generator for the motorized potentiometer of the technology controller.

- **Dependency:** Refer to: r2245

- **Note:**
  - When the initial rounding-off is activated (p2230.2 = 1) the ramp-down is correspondingly extended.

- **Access level:** 2

- **Func. diagram:** 7954

- **Unit selection:** p0595

- **Expert list:** 1

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>- [%]</td>
<td>- [%]</td>
<td>- [%]</td>
</tr>
</tbody>
</table>

#### Description:
Sets the configuration of the technology controller.

#### Bit field:
<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Ramp-up/down time independent of set-point sign</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>01</td>
<td>Integrator independent of Kp</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>02</td>
<td>Output signal without ramp active</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>03</td>
<td>Actual value limiting</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
</tbody>
</table>

#### Dependency:
Refer to: p2257, p2258, p2280, p2285

#### Note:
- Re bit 00 = 0:
  - The ramp-down time (p2258) switches to the ramp-up time (p2257) when the sign for the output signal r2260 changes. When the sign changes, the output signal is kept at zero for one arithmetic cycle.
  - Re bit 00 = 1:
    - When r2260 exhibits a positive gradient, the ramp-up time (p2257) is active; when it exhibits a negative gradient, the ramp-down time (p2258) is active. The sign for r2260 does not have any effect on the ramp time.
    - Re bit 01 = 0:
      - The integration time of the PID controller is evaluated with the gain factor Kp (p2280) (p2285 = integral time).
      - Re bit 01 = 1:
        - The integration time of the PID controller is independent of the gain factor (p2285 = integral time) if p2280 > 0.
        - Re bit 02 = 0:
          - When the PID controller is de-activated via p2200, the output signal r2294 is reduced to zero via the ramp-down time p2293.
          - Re bit 02 = 1:
            - When the PID controller is de-activated via p2200, the output signal r2294 is set directly to zero.
            - Re bit 03 = 0:
              - The actual values are not limited by p2267 and p2268.
              - Re bit 03 = 1:
                - The actual values are limited by p2267 and p2268.
### Description:
Sets the signal source for the setpoint 1 of the technology controller.

### Dependency:
Refer to: p2254, p2255

### Description:
Sets the signal source for the setpoint 2 of the technology controller.

### Dependency:
Refer to: p2253, p2256

### Description:
Sets the scaling for the setpoint 1 of the technology controller.

### Description:
Sets the scaling for the setpoint 2 of the technology controller.
### List of parameters

#### p2257 Technology controller, ramp-up time / Tec_ctrl t_ramp-up

| Parameter                          | Description                                                                 | Dependency | Access level | Data type          | Dynamic index | Units group | Unit selection | Expert list | Factory setting |
|------------------------------------|-----------------------------------------------------------------------------|------------|--------------|-------------------|---------------|-------------|----------------|-------------|----------------|----------------|
| p2257                              | Sets the ramp-up time of the technology controller.                         | Refer to: p2252, p2258 | 2            | FloatingPoint32   | -             | -           | -              | 1           | 1.00 [s]        |
| SERVO_S110-CAN (Tech_ctrl),        |                                                                             |            |              |                   |               |             |                |             |                |
| SERVO_S110-DP (Tech_ctrl),         |                                                                             |            |              |                   |               |             |                |             |                |
| SERVO_S110-PN (Tech_ctrl)          |                                                                             |            |              |                   |               |             |                |             |                |
| Min                                | 0.00 [s]                                                                    | Max        | 650.00 [s]   |                   |               |             |                |             |                |

#### p2258 Technology controller ramp-down time / Tec_ctrl t_ramp-dn

| Parameter                          | Description                                                                 | Dependency | Access level | Data type          | Dynamic index | Units group | Unit selection | Expert list | Factory setting |
|------------------------------------|-----------------------------------------------------------------------------|------------|--------------|-------------------|---------------|-------------|----------------|-------------|----------------|----------------|
| p2258                              | Sets the ramp-down time of the technology controller.                       | Refer to: p2252, p2257 | 2            | FloatingPoint32   | -             | -           | -              | 1           | 1.00 [s]        |
| SERVO_S110-CAN (Tech_ctrl),        |                                                                             |            |              |                   |               |             |                |             |                |
| SERVO_S110-DP (Tech_ctrl),         |                                                                             |            |              |                   |               |             |                |             |                |
| SERVO_S110-PN (Tech_ctrl)          |                                                                             |            |              |                   |               |             |                |             |                |
| Min                                | 0.00 [s]                                                                    | Max        | 650.00 [s]   |                   |               |             |                |             |                |

#### r2260 CO: Technology controller setpoint after ramp-function generator / Tec_ctr set aftRFG

| Parameter                          | Description                                                                 | Access level | Data type          | Dynamic index | Units group | Unit selection | Expert list | Factory setting |
|------------------------------------|-----------------------------------------------------------------------------|--------------|-------------------|---------------|-------------|----------------|-------------|----------------|----------------|
| r2260                              | Sets the setpoint after the ramp-function generator of the technology controller. | 2            | FloatingPoint32   | -             | 9_1         | p0595          | 1           |                |
| SERVO_S110-CAN (Tech_ctrl),        |                                                                             |              |                   |               |             |                |             |                |
| SERVO_S110-DP (Tech_ctrl),         |                                                                             |              |                   |               |             |                |             |                |
| SERVO_S110-PN (Tech_ctrl)          |                                                                             |              |                   |               |             |                |             |                |
| Min                                | - [%]                                                                       | Max         | - [%]              | PERCENT       |             |                |             |                |

#### p2261 Technology controller setpoint filter time constant / Tec_ctrl set T

| Parameter                          | Description                                                                 | Access level | Data type          | Dynamic index | Units group | Unit selection | Expert list | Factory setting |
|------------------------------------|-----------------------------------------------------------------------------|--------------|-------------------|---------------|-------------|----------------|-------------|----------------|----------------|
| p2261                              | Sets the time constant for the setpoint filter (PT1) of the technology controller. | 3            | FloatingPoint32   | -             | -           | -              | 1           | 0.000 [s]      |
| SERVO_S110-CAN (Tech_ctrl),        |                                                                             |              |                   |               |             |                |             |                |
| SERVO_S110-DP (Tech_ctrl),         |                                                                             |              |                   |               |             |                |             |                |
| SERVO_S110-PN (Tech_ctrl)          |                                                                             |              |                   |               |             |                |             |                |
| Min                                | 0.000 [s]                                                                    | Max         | 60.000 [s]         |               |             |                |             | 0.000 [s]     |
### Parameter List of parameters

#### r2262
**CO: Technology controller setpoint after filter / Tec_ctr set aftFit**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Can be changed</th>
<th>Calculated</th>
<th>Access level</th>
<th>Data type</th>
<th>Dynamic index</th>
<th>Units group</th>
<th>Scaling</th>
<th>Expert list</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN (Tech_ctrl), SERVO_S110-DP (Tech_ctrl), SERVO_S110-PN (Tech_ctrl)</td>
<td>Displays the smoothed setpoint after the setpoint filter (PT1) of the technology controller.</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td>FloatingPoint32</td>
<td>-</td>
<td>9_1</td>
<td>PERCENT</td>
<td>1</td>
<td>- [%] - [%] - [%]</td>
</tr>
</tbody>
</table>

#### p2263
**Technology controller type / Tec_ctrl type**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Can be changed</th>
<th>Calculated</th>
<th>Access level</th>
<th>Data type</th>
<th>Dynamic index</th>
<th>Units group</th>
<th>Scaling</th>
<th>Expert list</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN (Tech_ctrl), SERVO_S110-DP (Tech_ctrl), SERVO_S110-PN (Tech_ctrl)</td>
<td>Sets the technology controller type.</td>
<td>T</td>
<td>-</td>
<td>3</td>
<td>Integer16</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>0 1 0</td>
</tr>
</tbody>
</table>

#### p2264[0...n]
**Cl: Technology controller actual value / Tec_ctrl act val**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Can be changed</th>
<th>Calculated</th>
<th>Access level</th>
<th>Data type</th>
<th>Dynamic index</th>
<th>Units group</th>
<th>Scaling</th>
<th>Expert list</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN (Tech_ctrl), SERVO_S110-DP (Tech_ctrl), SERVO_S110-PN (Tech_ctrl)</td>
<td>Sets the signal source for the actual value of the technology controller.</td>
<td>U, T</td>
<td>-</td>
<td>2</td>
<td>Unsigned32 / FloatingPoint32</td>
<td>CDS, p0170</td>
<td>-</td>
<td>PERCENT</td>
<td>1</td>
<td>-</td>
</tr>
</tbody>
</table>

#### p2265
**Technology controller actual value filter time constant / Tec_ctrl act T**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Can be changed</th>
<th>Calculated</th>
<th>Access level</th>
<th>Data type</th>
<th>Dynamic index</th>
<th>Units group</th>
<th>Scaling</th>
<th>Expert list</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN (Tech_ctrl), SERVO_S110-DP (Tech_ctrl), SERVO_S110-PN (Tech_ctrl)</td>
<td>Sets the time constant for the actual value filter (PT1) of the technology controller.</td>
<td>U, T</td>
<td>-</td>
<td>2</td>
<td>FloatingPoint32</td>
<td>-</td>
<td>9_1</td>
<td>PERCENT</td>
<td>1</td>
<td>0.000 [s] 60.000 [s] 0.000 [s]</td>
</tr>
</tbody>
</table>

#### r2266
**CO: Technology controller actual value after filter / Tec_ctr act aftFIt**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Can be changed</th>
<th>Calculated</th>
<th>Access level</th>
<th>Data type</th>
<th>Dynamic index</th>
<th>Units group</th>
<th>Scaling</th>
<th>Expert list</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN (Tech_ctrl), SERVO_S110-DP (Tech_ctrl), SERVO_S110-PN (Tech_ctrl)</td>
<td>Displays the smoothed actual value after the filter (PT1) of the technology controller</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>FloatingPoint32</td>
<td>-</td>
<td>9_1</td>
<td>PERCENT</td>
<td>1</td>
<td>- [%] - [%] - [%]</td>
</tr>
</tbody>
</table>
**List of parameters**

**p2267**
Technology controller upper limit actual value / Tec_ctrl u_lim act

- **SERVO_S110-CAN (Tech_ctrl)**
- **SERVO_S110-DP (Tech_ctrl)**
- **SERVO_S110-PN (Tech_ctrl)**

**Description:**
Sets the upper limit for the actual value signal of the technology controller.

**Dependency:**
Refer to: p2264, p2265, p2271
Refer to: F07426

**Notice:**
If the actual value exceeds this upper limit, this results in fault F07426.

**Note:**
Limiting only active for p2252 bit 3 = 1.

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-200.00 [%]</td>
<td>200.00 [%]</td>
<td>200.00 [%]</td>
</tr>
</tbody>
</table>

**p2268**
Technology controller lower limit actual value / Tec_ctrl l_lim act

- **SERVO_S110-CAN (Tech_ctrl)**
- **SERVO_S110-DP (Tech_ctrl)**
- **SERVO_S110-PN (Tech_ctrl)**

**Description:**
Sets the lower limit for the actual value signal of the technology controller.

**Dependency:**
Refer to: p2264, p2265, p2271
Refer to: F07426

**Notice:**
If the actual value falls below this lower limit, this results in fault F07426.

**Note:**
Limiting only active for p2252 bit 3 = 1.

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-200.00 [%]</td>
<td>200.00 [%]</td>
<td>-200.00 [%]</td>
</tr>
</tbody>
</table>

**p2269**
Technology controller gain actual value / Tech_ctrl gain act

- **SERVO_S110-CAN (Tech_ctrl)**
- **SERVO_S110-DP (Tech_ctrl)**
- **SERVO_S110-PN (Tech_ctrl)**

**Description:**
Scaling factor for the actual value of the technology controller.

**Dependency:**
Refer to: p2264, p2265, p2267, p2268, p2271

**Note:**
For 100%, the actual value is not changed.

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.00 [%]</td>
<td>500.00 [%]</td>
<td>100.00 [%]</td>
</tr>
</tbody>
</table>

**p2270**
Technology controller actual value function / Tec_ctr ActVal fct

- **SERVO_S110-CAN (Tech_ctrl)**
- **SERVO_S110-DP (Tech_ctrl)**
- **SERVO_S110-PN (Tech_ctrl)**

**Description:**
Setting to use an arithmetic function for the actual value signal of the technology controller.

**Value:**
0: No function
1: Root function (root from x)
2: Square function \((x \times x)\)  
3: Cube function \((x \times x \times x)\)

Dependency:
Refer to: p2264, p2265, p2267, p2268, p2269, p2271

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Caution</th>
</tr>
</thead>
</table>
| p2271 Technology controller actual value inversion (sensor type) / Tech_ctrl act inv | Setting to invert the actual value signal of the technology controller. The inversion depends on the sensor type for the actual value signal. | 0: No inversion  
1: Inversion actual value signal | If the actual value inversion is incorrectly selected, then the closed-loop control with the technology controller can become unstable and can oscillate! |

Note: The correct setting can be determined as follows:  
- inhibit the technology controller \((p2200 = 0)\).  
- increase the motor speed and in so doing, measure the actual value signal of the technology controller.  
---> If the actual value increases as the motor speed increases, then \(p2271\) should be set to 0 (no inversion).  
---> If the actual value decreases as the motor speed increases, then \(p2271\) should be set to 1 (the actual value signal is inverted).

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Caution</th>
</tr>
</thead>
<tbody>
<tr>
<td>r2272 CO: Technology controller actual value scaled / Tech_ctrl act scal</td>
<td>Displays the scaled actual value signal of the technology controller.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Caution</th>
</tr>
</thead>
<tbody>
<tr>
<td>r2273 CO: Technology controller error / Tec_ctrl error</td>
<td>Displays the error (system deviation) between the setpoint and actual value of the technology controller.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Caution</th>
</tr>
</thead>
</table>

### p2274 Technology controller differentiation, time constant / Tec_ctrl D comp T

**Description:** Sets the time constant for the differentiation (D component) of the technology controller.

**Note:**
- \( p2274 = 0 \): Differentiation is disabled.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min</td>
<td>0.000 [s]</td>
<td>0.000 [s]</td>
</tr>
<tr>
<td>Max</td>
<td>60.000 [s]</td>
<td>0.000 [s]</td>
</tr>
</tbody>
</table>

### p2280 Technology controller proportional gain / Tec_ctrl Kp

**Description:** Sets the proportional gain (P component) of the technology controller.

**Dependency:** Refer to: p2252

**Note:**
- \( p2280 = 0 \): The proportional gain is disabled.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min</td>
<td>0.000</td>
<td>1.000</td>
</tr>
<tr>
<td>Max</td>
<td>1000.000</td>
<td>1.000</td>
</tr>
</tbody>
</table>

### p2285 Technology controller integral time / Tec_ctrl Tn

**Description:** Sets the integral time (I component, integrating time constant) of the technology controller.

**Dependency:** Refer to: p2252

**Note:**
- \( p2285 = 0 \): The integral time is disabled.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min</td>
<td>0.000 [s]</td>
<td>0.000 [s]</td>
</tr>
<tr>
<td>Max</td>
<td>60.000 [s]</td>
<td>0.000 [s]</td>
</tr>
</tbody>
</table>

### p2286[0...n] BI: Hold technology controller integrator / Tec_ctr integ stop

**Description:** Sets the signal source to hold the integrator for the technology controller.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Max</td>
<td>-</td>
<td>0</td>
</tr>
</tbody>
</table>

---

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SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3
### Parameter List of parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p2289[0...n]</td>
<td>CI: Technology controller pre-control signal / Tec_ctrl prectrl</td>
<td>Can be changed: U, T</td>
</tr>
<tr>
<td>SERVO_S110-CAN (Tech_ctrl), SERVO_S110-DP (Tech_ctrl), SERVO_S110-PN (Tech_ctrl)</td>
<td>Calculated: -</td>
<td>Dynamic index: CDS, p0170</td>
</tr>
<tr>
<td></td>
<td>Data type: Unsigned32 / FloatingPoint32</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td></td>
<td>P-Group: Technology</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td></td>
<td>Not for motor type: -</td>
<td>Min Max</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- -</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sets the signal source for the pre-control signal of the technology controller.</td>
</tr>
</tbody>
</table>

| p2291 | CO: Technology controller maximum limiting / Tec_ctrl max_limit | Can be changed: U, T | Access level: 2 |
| SERVO_S110-CAN (Tech_ctrl), SERVO_S110-DP (Tech_ctrl), SERVO_S110-PN (Tech_ctrl) | Calculated: - | Dynamic index: - |
| | Data type: FloatingPoint32 | Units group: - |
| | P-Group: Technology | Scaling: PERCENT |
| | Not for motor type: - | Min Max | Factory setting |
| | | -200.00 [%] 200.00 [%] | 100.00 [%] |
| | | | |
| | | Sets the maximum limit of the technology controller. | |
| | | | |
| | | | |
| | | Dependencies: | |
| | | Refer to: p2292 | |
| | | Caution: | |
| | | The maximum limit must always be greater than the minimum limit (p2291 > p2292). | |

| p2292 | CO: Technology controller minimum limiting / Tec_ctrl min_lim | Can be changed: U, T | Access level: 2 |
| SERVO_S110-CAN (Tech_ctrl), SERVO_S110-DP (Tech_ctrl), SERVO_S110-PN (Tech_ctrl) | Calculated: - | Dynamic index: - |
| | Data type: FloatingPoint32 | Units group: - |
| | P-Group: Technology | Scaling: PERCENT |
| | Not for motor type: - | Min Max | Factory setting |
| | | -200.00 [%] 200.00 [%] | 0.00 [%] |
| | | | |
| | | Sets the minimum limit of the technology controller. | |
| | | | |
| | | | |
| | | Dependencies: | |
| | | Refer to: p2291 | |
| | | Caution: | |
| | | The maximum limit must always be greater than the minimum limit (p2291 > p2292). | |

| p2293 | Technology controller ramp-up/ramp-down time / Tec_ctr ramp up/dn | Can be changed: U, T | Access level: 3 |
| SERVO_S110-CAN (Tech_ctrl), SERVO_S110-DP (Tech_ctrl), SERVO_S110-PN (Tech_ctrl) | Calculated: - | Dynamic index: - |
| | Data type: FloatingPoint32 | Units group: - |
| | P-Group: Technology | Scaling: - |
| | Not for motor type: - | Min Max | Factory setting |
| | | 0.00 [s] 100.00 [s] | 1.00 [s] |
| | | | |
| | | Sets the ramping time for the output signal of the technology controller. | |
| | | | |
| | | Dependencies: | |
| | | Refer to: p2291, p2292 | |
| | | Note: | |
| | | The time refers to the set maximum and minimum limits (p2291, p2292). | |
### List of parameters

#### r2294

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Displays the output signal of the technology controller.</td>
</tr>
<tr>
<td>Dependency</td>
<td>Refer to: p2295</td>
</tr>
<tr>
<td>CO: Technology controller output signal / Tec_ctrl outp_sig</td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-CAN (Tech_ctrl), SERVO_S110-DP (Tech_ctrl), SERVO_S110-PN (Tech_ctrl)</td>
<td></td>
</tr>
<tr>
<td>Can be changed:</td>
<td>-</td>
</tr>
<tr>
<td>Calculated:</td>
<td>-</td>
</tr>
<tr>
<td>Data type:</td>
<td>FloatingPoint32</td>
</tr>
<tr>
<td>Dynamic index:</td>
<td>-</td>
</tr>
<tr>
<td>Units group:</td>
<td>-</td>
</tr>
<tr>
<td>Access level:</td>
<td>2</td>
</tr>
<tr>
<td>P-Group:</td>
<td>Technology</td>
</tr>
<tr>
<td>Scaling:</td>
<td>PERCENT</td>
</tr>
<tr>
<td>Expert list:</td>
<td>1</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
</tr>
<tr>
<td>Min</td>
<td>- [%]</td>
</tr>
<tr>
<td>Max</td>
<td>- [%]</td>
</tr>
<tr>
<td>Factory setting</td>
<td>- [%]</td>
</tr>
</tbody>
</table>

#### p2295

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Sets the scaling for the output signal of the technology controller.</td>
</tr>
<tr>
<td>Dependency</td>
<td>Refer to: p2295</td>
</tr>
<tr>
<td>CO: Technology controller output scaling / Tec_ctrl outp scal</td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-CAN (Tech_ctrl), SERVO_S110-DP (Tech_ctrl), SERVO_S110-PN (Tech_ctrl)</td>
<td></td>
</tr>
<tr>
<td>Can be changed:</td>
<td>U, T</td>
</tr>
<tr>
<td>Calculated:</td>
<td>-</td>
</tr>
<tr>
<td>Data type:</td>
<td>FloatingPoint32</td>
</tr>
<tr>
<td>Dynamic index:</td>
<td>-</td>
</tr>
<tr>
<td>Units group:</td>
<td>-</td>
</tr>
<tr>
<td>Access level:</td>
<td>3</td>
</tr>
<tr>
<td>P-Group:</td>
<td>Technology</td>
</tr>
<tr>
<td>Scaling:</td>
<td>PERCENT</td>
</tr>
<tr>
<td>Expert list:</td>
<td>1</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
</tr>
<tr>
<td>Min</td>
<td>-100.00 [%]</td>
</tr>
<tr>
<td>Max</td>
<td>100.00 [%]</td>
</tr>
<tr>
<td>Factory setting</td>
<td>100.00 [%]</td>
</tr>
</tbody>
</table>

#### p2296[0...n]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Sets the signal source for the scaling value of the technology controller.</td>
</tr>
<tr>
<td>Dependency</td>
<td>Refer to: p2295</td>
</tr>
<tr>
<td>CI: Technology controller output scaling / Tec_ctrl outp scal</td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-CAN (Tech_ctrl), SERVO_S110-DP (Tech_ctrl), SERVO_S110-PN (Tech_ctrl)</td>
<td></td>
</tr>
<tr>
<td>Can be changed:</td>
<td>U, T</td>
</tr>
<tr>
<td>Calculated:</td>
<td>-</td>
</tr>
<tr>
<td>Data type:</td>
<td>Unsigned32 / FloatingPoint32</td>
</tr>
<tr>
<td>Dynamic index:</td>
<td>CDS, p0170</td>
</tr>
<tr>
<td>Units group:</td>
<td>-</td>
</tr>
<tr>
<td>Access level:</td>
<td>2</td>
</tr>
<tr>
<td>P-Group:</td>
<td>Technology</td>
</tr>
<tr>
<td>Scaling:</td>
<td>PERCENT</td>
</tr>
<tr>
<td>Expert list:</td>
<td>1</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
</tr>
<tr>
<td>Min</td>
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<tr>
<td>Max</td>
<td>-</td>
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<tr>
<td>Factory setting</td>
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#### p2297[0...n]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Sets the signal source for the maximum limiting of the technology controller.</td>
</tr>
<tr>
<td>Dependency</td>
<td>Refer to: p2291</td>
</tr>
<tr>
<td>CI: Technology controller maximum limit signal source / Tec_ctrl m_lm s_sc</td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-CAN (Tech_ctrl), SERVO_S110-DP (Tech_ctrl), SERVO_S110-PN (Tech_ctrl)</td>
<td></td>
</tr>
<tr>
<td>Can be changed:</td>
<td>U, T</td>
</tr>
<tr>
<td>Calculated:</td>
<td>-</td>
</tr>
<tr>
<td>Data type:</td>
<td>Unsigned32 / FloatingPoint32</td>
</tr>
<tr>
<td>Dynamic index:</td>
<td>CDS, p0170</td>
</tr>
<tr>
<td>Units group:</td>
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</tr>
<tr>
<td>Access level:</td>
<td>2</td>
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<tr>
<td>P-Group:</td>
<td>Technology</td>
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<tr>
<td>Scaling:</td>
<td>PERCENT</td>
</tr>
<tr>
<td>Expert list:</td>
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</tr>
<tr>
<td>Not for motor type:</td>
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</tr>
<tr>
<td>Min</td>
<td>-</td>
</tr>
<tr>
<td>Max</td>
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</tr>
<tr>
<td>Factory setting</td>
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</table>

#### p2298[0...n]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
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<tbody>
<tr>
<td>Description</td>
<td>Sets the signal source for the minimum limiting of the technology controller.</td>
</tr>
<tr>
<td>Dependency</td>
<td>Refer to: p2291</td>
</tr>
<tr>
<td>CI: Technology controller minimum limit signal source / Tec_ctrl min_l s_s</td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-CAN (Tech_ctrl), SERVO_S110-DP (Tech_ctrl), SERVO_S110-PN (Tech_ctrl)</td>
<td></td>
</tr>
<tr>
<td>Can be changed:</td>
<td>U, T</td>
</tr>
<tr>
<td>Calculated:</td>
<td>-</td>
</tr>
<tr>
<td>Data type:</td>
<td>Unsigned32 / FloatingPoint32</td>
</tr>
<tr>
<td>Dynamic index:</td>
<td>CDS, p0170</td>
</tr>
<tr>
<td>Units group:</td>
<td>-</td>
</tr>
<tr>
<td>Access level:</td>
<td>2</td>
</tr>
<tr>
<td>P-Group:</td>
<td>Technology</td>
</tr>
<tr>
<td>Scaling:</td>
<td>PERCENT</td>
</tr>
<tr>
<td>Expert list:</td>
<td>1</td>
</tr>
<tr>
<td>Not for motor type:</td>
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<td>Min</td>
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</tr>
<tr>
<td>Max</td>
<td>-</td>
</tr>
<tr>
<td>Factory setting</td>
<td>2292[0]</td>
</tr>
</tbody>
</table>

---

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SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3
Parameter

List of parameters

Dependency:
Refer to: p2292

p2299[0...n] CI: Technology controller limit offset / Tech_ctrl lim offs

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type:</td>
<td>Unsigned32 / FloatingPoint32</td>
<td>Can be changed: U, T</td>
</tr>
<tr>
<td>P-Group:</td>
<td>Technology</td>
<td>Calculated: -</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
<td>Access level: 2</td>
</tr>
</tbody>
</table>

Min: -
Max: -
Factory setting: 0

Description: Sets the signal source for the offset of the output limiting of the technology controller.

p2306 Technology controller fault signal inversion / Tec_ctrl fault inv

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type:</td>
<td>Integer16</td>
<td>Can be changed: T</td>
</tr>
<tr>
<td>P-Group:</td>
<td>Technology</td>
<td>Calculated: -</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
<td>Access level: 3</td>
</tr>
</tbody>
</table>

Min: 0
Max: 1
Factory setting: 0

Description: Setting to invert the fault signal of the technology controller.
The setting depends on the type of control loop.

Value:
0: No inversion
1: Inversion

Caution: If the actual value inversion is incorrectly selected, then the closed-loop control with the technology controller can become unstable and can oscillate!

Note:
The correct setting can be determined as follows:
- inhibit the technology controller (p2200 = 0).
- increase the motor speed and in so doing, measure the actual value signal (of the technology controller).
- if the actual value increases with increasing motor speed, then the inversion should be switched out.
- if the actual value decreases with increasing motor speed, then the inversion should be set.
If value = 0:
The drive reduces the output speed when the actual value rises (e.g. for heating fans, intake pump, compressor).
If value = 1:
The drive increases the output speed when the actual value increases (e.g. for cooling fans, discharge pumps).

r2349.0...11 CO/BO: Technology controller status word / Tec_ctrl status

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type:</td>
<td>Unsigned32</td>
<td>Can be changed: -</td>
</tr>
<tr>
<td>P-Group:</td>
<td>Technology</td>
<td>Calculated: -</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
<td>Access level: 3</td>
</tr>
</tbody>
</table>

Min: -
Max: -
Factory setting: -

Description: Displays the status word of the technology controller.

Bit field:

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Technology controller de-activated</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>01</td>
<td>Technology controller limited</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>02</td>
<td>Technology controller, motorized potentiometer limited max.</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>03</td>
<td>Technology controller, motorized potentiometer limited min.</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
</tbody>
</table>
List of parameters

08 Technology controller actual value at the minimum
Value: Yes No -

09 Technology controller actual value at the maximum
Value: Yes No -

10 Technology controller output at the minimum
Value: Yes No -

11 Technology controller output at the maximum
Value: Yes No -

p2502[0...n] LR encoder assignment / Encoder assignment
SERVO_S110-CAN (Pos ctrl), SERVO_S110-DP (Pos ctrl), SERVO_S110-PN (Pos ctrl)
Can be changed: C2(25) Calculated: - Access level: 1
Data type: Integer16 Dynamic index: DDS, p0180 Func. diagram: 4010
P-Group: Closed loop position control Units group: - Unit selection: -
Not for motor type: - Scaling: - Expert list: 1
Min Max Factory setting
0 2 1

Description: Sets the assigned encoder.
The actual value preprocessing and the closed-loop position control are carried out using the assigned encoder.

Value: 0: No encoder 1: Encoder 1 2: Encoder 2

Dependency: Refer to: p0187, p0188
Notice: For the setting p2502 = 0 (no encoder), closed-loop position control is not possible. This setting is only practical as supportive measure to implement encoderless closed-loop speed control (e.g. if the motor encoder is defective).
Note: The assigned encoder (p2502 = 1, 2) must be allocated an encoder data set (p0187, p0188).

p2503[0...n] LR length unit LU per 10 mm / LU per 10 mm
SERVO_S110-CAN (Pos ctrl), SERVO_S110-DP (Pos ctrl), SERVO_S110-PN (Pos ctrl)
Can be changed: C2(25) Calculated: - Access level: 1
Data type: Unsigned32 Dynamic index: DDS, p0180 Func. diagram: 4010
P-Group: Closed loop position control Units group: - Unit selection: -
Not for motor type: - Scaling: - Expert list: 1
Min Max Factory setting
1 [LU] 2147483647 [LU] 10000 [LU]

Description: Sets the neutral length units LU per 10 mm.
Therefore, for a linear scale, a reference is established between the physical arrangement and the neutral length units LU used in the drive.
Example: Linear scale, 10 mm should be broken down to units of µm (i.e. 1 LU = 1 µm).
--> p2503 = 10000

Note: The assignment to the grid spacing can be achieved using this for a rotary axis with linear encoder.

p2504[0...n] LR motor/load motor revolutions / Mot/load motor rev
SERVO_S110-CAN (Pos ctrl), SERVO_S110-DP (Pos ctrl), SERVO_S110-PN (Pos ctrl)
Can be changed: C2(25) Calculated: - Access level: 1
Data type: Unsigned32 Dynamic index: DDS, p0180 Func. diagram: 4010, 4704, 4711
P-Group: Closed loop position control Units group: - Unit selection: -
Not for motor type: - Scaling: - Expert list: 1
Min Max Factory setting
1 1048576 1

Description: Sets the motor revolutions for the gearbox factor between the motor shaft and load shaft.
Gearbox factor = motor revolutions (p2504) / load revolutions (p2505)

Dependency: Refer to: p0432, p0433, p2505
Note: The gearbox factor between the encoder shaft and the motor shaft is set using p0432 and p0433.
## p2505[0...n] LR motor/load motor revolutions / Mot/load motor rev

<table>
<thead>
<tr>
<th>Description</th>
<th>Can be changed: C2(25)</th>
<th>Calculated: -</th>
<th>Access level: 1</th>
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<tbody>
<tr>
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<td>Dynamic index: DDS, p0180</td>
<td>Func. diagram: 4010, 4704, 4711</td>
</tr>
<tr>
<td>P-Group</td>
<td>Closed loop position control</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type</td>
<td>-</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-1048576</td>
<td>1048576</td>
<td>1</td>
</tr>
</tbody>
</table>

**Description:**
Sets the load revolutions for the gearbox factor between the motor shaft and load shaft.

**Dependency:**
Gearbox factor = motor revolutions (p2504) / load revolutions (p2505)

**Note:**
The gearbox factor between the encoder shaft and the motor shaft is set using p0432 and p0433.

## p2506[0...n] LR length unit LU per load revolution / LU per load rev

<table>
<thead>
<tr>
<th>Description</th>
<th>Can be changed: C2(25)</th>
<th>Calculated: -</th>
<th>Access level: 1</th>
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</thead>
<tbody>
<tr>
<td>Data type</td>
<td>Unsigned32</td>
<td>Dynamic index: DDS, p0180</td>
<td>Func. diagram: 4010</td>
</tr>
<tr>
<td>P-Group</td>
<td>Closed loop position control</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type</td>
<td>-</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 [LU]</td>
<td>2147483647 [LU]</td>
<td>10000 [LU]</td>
</tr>
</tbody>
</table>

**Description:**
Sets the neutral length units LU per load revolution.

**Example:**
Rotary encoder, ballscrew with 10 mm/revolution, 10 mm should be broken down to units of µm (i.e. 1 LU = 1 µm).

--> One load revolution corresponds to 10000 LU

--> p2506 = 10000

**Note:**
The position controller can only process position setpoints in the interpolator clock cycle (IPO clock cycle) in integer length units (LU, Length Unit). This is the reason that speed setpoints that are not a multiple integer of 1 LU per IPO clock cycle can only be realized as an average. The result speed setpoint steps are especially noticeable for a high loop gain or when the pre-control is active. Increasing p2506 counteracts this behavior.

## p2507[0...n] LR absolute encoder adjustment status / Abs_enc_adj stat

<table>
<thead>
<tr>
<th>Description</th>
<th>Can be changed: U, T</th>
<th>Calculated: -</th>
<th>Access level: 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type</td>
<td>Integer16</td>
<td>Dynamic index: EDS, p0140</td>
<td>Func. diagram: 4010</td>
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<tr>
<td>P-Group</td>
<td>Closed loop position control</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type</td>
<td>-</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>3</td>
<td>1</td>
</tr>
</tbody>
</table>

**Description:**
Activating the adjustment and display of the status of the adjustment for absolute encoders.

**Value:**
0: Error occurred while adjusting
1: Absolute encoder not adjusted
2: Absolute encoder not adjusted and encoder adjustment initiated
3: Absolute encoder adjusted

**Dependency:**
Refer to: p2525, p2598, p2599
Caution:
For rotating absolute encoders, when adjusting, a range is set up symmetrically around zero with half of the encoder range, within which the position must be re-established after powering down/powering up. In this range, it is only permissible that the encoder overflows.

After the adjustment has been completed, it must be guaranteed that the range is not exited. The reason for this is that outside the range, there is no clear reference any longer between the encoder actual value and mechanical system.

If the reference point (CI: p2598) lies in this range, then the position actual value is set when adjusting to the reference point. Otherwise, adjustment is canceled with F07443.

There is no overflow for linear absolute encoders. This means that after the adjustment, the position can be re-established in the complete traversing range after powering down/powering up. When adjusting, the position actual value is set to the reference point.

Note:
The encoder adjustment is initiated with p2507 = 2. The status is displayed using the other values.

In order to permanently save the determined position offset (p2525) it must be saved in a non-volatile fashion (p0971, p0977).

This adjustment can only be initiated for an absolute encoder.

### p2508[0...3]

**BI: LR activate reference mark search / Ref_mark act**

| Data type: | Unsigned32 / Binary |
| Dynamic index: | - |
| Units group: | - |
| Scaling: | - |

**Not for motor type:** -

**Dependency:**
- Refer to: p0490, p0495, p2502, p2509, r2684
- Refer to: A07495

**Notice:**
When activating the function "set position actual value" while the function "reference mark search" is activated, then the function "reference mark search" is automatically de-activated.

**Note:**
- When the function module "basic positioner" (r0108.4 = 1) is activated, the following BICO interconnection is established: BI: p2508[0] = r2684.0
- The function can only be activated using a 0/1 signal if no reference function is active (r2526.2).
- If "reference mark search" and "measuring probe evaluation" are simultaneously activated, then no function is activated and the actual function is interrupted.

### p2509[0...3]

**BI: LR activating measuring probe evaluation / MT_eval act**

| Data type: | Unsigned32 / Binary |
| Dynamic index: | - |
| Units group: | - |
| Scaling: | - |

**Not for motor type:** -

**Dependency:**
- Refer to: p0488, p0489, p0490, p2502, p2508, p2510, p2511, p2517, p2518
- Refer to: A07495
Notice: When the "set position actual value" is activated while the function "measuring probe evaluation" is activated, then the function "measuring probe evaluation" is automatically de-activated.

Note: When the function module "basic positioner" (r0108.4 = 1) is activated, the following BICO interconnection is established: BI: p2509[0] = r2684.1

The function can only be activated using a 0/1 signal if no reference function is active (r2526.2).

If "reference mark search" and "measuring probe evaluation" are simultaneously activated, then no function is activated and the actual function is interrupted.

### p2510[0...3]

**BI: LR selecting measuring probe evaluation / MT_eval select**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN (Pos ctrl),</td>
<td>T</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>SERVO_S110-DP (Pos ctrl),</td>
<td></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-PN (Pos ctrl),</td>
<td></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td><strong>Data type:</strong> Unsigned32 / Binary</td>
<td></td>
<td>-</td>
<td>3615, 4010</td>
</tr>
<tr>
<td><strong>P-Group:</strong> Closed loop position control</td>
<td></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td><strong>Not for motor type:</strong></td>
<td></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td><strong>Min</strong></td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td><strong>Max</strong></td>
<td>-</td>
<td>-</td>
<td>0</td>
</tr>
<tr>
<td><strong>Description:</strong> Sets the signal source to select the measuring probe. 1 signal = measuring probe 2 is activated for BI: p2509 = 0/1 edge. 0 signal = measuring probe 1 is activated for BI: p2509 = 0/1 edge.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Dependency:</strong> Refer to: p2502, p2509, p2511</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Note:</strong> When the function module &quot;basic positioner&quot; (r0108.4 = 1) is activated, the following BICO interconnection is established: BI: p2509[0] = r2684.1 The measuring probe is selected at the 0/1 signal transition at r2684.1 (flying referencing active).</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### p2511[0...3]

**BI: LR measuring probe evaluation edge / MT_eval edge**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN (Pos ctrl),</td>
<td>T</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>SERVO_S110-DP (Pos ctrl),</td>
<td></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-PN (Pos ctrl),</td>
<td></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td><strong>Data type:</strong> Unsigned32 / Binary</td>
<td></td>
<td>-</td>
<td>3615, 4010</td>
</tr>
<tr>
<td><strong>P-Group:</strong> Closed loop position control</td>
<td></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td><strong>Not for motor type:</strong></td>
<td></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td><strong>Min</strong></td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td><strong>Max</strong></td>
<td>-</td>
<td>-</td>
<td>0</td>
</tr>
<tr>
<td><strong>Description:</strong> Sets the signal source for the edge evaluation of the measuring probe. 1 signal = falling edge of the measuring probe (p2510) is activated for BI: p2509 = 0/1 edge. 0 signal = rising edge of the measuring probe (p2510) is activated for BI: p2509 = 0/1 edge.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Dependency:</strong> Refer to: p2502, p2509, p2510</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### List of parameters

#### Parameter: p2512[0...3]

**Description:**
Sets the signal source for the function "activate position actual value preprocessing, corrective value (edge)".

**Index:**
- [0] = Closed-loop position control
- [1] = Encoder 1
- [2] = Encoder 2
- [3] = Reserved

**Dependency:**
Refer to: p2502, p2513, r2684

**Note:**
When the function module "basic positioner" (r0108.4 = 1) is activated, the following BICO interconnection is established: BI: p2512[0] = r2684.7

**Description:**
Sets the signal source for the corrective value for position actual value preprocessing.

**Index:**
- [0] = Closed-loop position control
- [1] = Encoder 1
- [2] = Encoder 2
- [3] = Reserved

**Dependency:**
Refer to: p2502, p2512, r2685

**Note:**
When the function module "basic positioner" (r0108.4 = 1) is activated, the following BICO interconnection is established: CI: p2513[0] = r2685

**Description:**
Sets the signal source to activate the function "set position actual value".

**Index:**
- [0] = Closed-loop position control
- [1] = Encoder 1
- [2] = Encoder 2
- [3] = Reserved

**Dependency:**
Refer to: p2502, p2515
Refer to: A07495, A07497
Warning: As long as the position actual value is set, encoder increments that are received are not evaluated. In this state, any position difference cannot be corrected!

Notice: When the function "set position actual value" is activated while the function "reference mark search" or "measuring probe evaluation" is activated, then the corresponding function is de-activated.

Note: BI: p2514 = 1 signal:
The position actual value is set to the setting value in CI: p2515. Alarm A07497 "position setting value activated" is output. Encoder increments that are received in the meantime, are not taken into account.

BI: p2514 = 1/0 signal:
The position actual value preprocessing is activated and is based on the setting value.

### p2515[0...3]
**Cl: LR position actual setting, setting value / s_act set setVal**

- **SERVO_S110-CAN (Pos ctrl), SERVO_S110-DP (Pos ctrl), SERVO_S110-PN (Pos ctrl)**
- **Can be changed:** T
- **Data type:** Unsigned32 / Integer32
- **Dynamic index:** -
- **Units group:** -
- **Not for motor type:** -
- **Scaling:** -
- **Access level:** 1
- **Func. diagram:** 4010

**Index:**
- [0] = Closed-loop position control
- [1] = Encoder 1
- [2] = Encoder 2
- [3] = Reserved

**Dependency:** Refer to: p2502, p2514

**Description:**
Sets the signal source for the setting value of the function "setting position actual value".

**Min** | **Max** | **Factory setting**
---|---|---
- | - | 0

### p2516[0...3]
**Cl: LR position offset / Position offset**

- **SERVO_S110-CAN (Pos ctrl), SERVO_S110-DP (Pos ctrl), SERVO_S110-PN (Pos ctrl)**
- **Can be changed:** T
- **Data type:** Unsigned32 / Integer32
- **Dynamic index:** -
- **Units group:** -
- **Not for motor type:** -
- **Scaling:** -
- **Access level:** 1
- **Func. diagram:** 4010

**Index:**
- [0] = Closed-loop position control
- [1] = Encoder 1
- [2] = Encoder 2
- [3] = Reserved

**Dependency:** Refer to: p2502, r2667

**Note:**
When the function module "basic positioner" (r0108.4 = 1) is activated, the following BICO interconnection is established: Cl: p2516[0] = r2667

### p2517[0...2]
**LR direct measuring probe 1 / Direct MT 1**

- **SERVO_S110-CAN (Pos ctrl), SERVO_S110-DP (Pos ctrl), SERVO_S110-PN (Pos ctrl)**
- **Can be changed:** U, T
- **Data type:** Integer16
- **Dynamic index:** -
- **Units group:** -
- **Not for motor type:** -
- **Scaling:** -
- **Access level:** 3
- **Func. diagram:** 4010

**Min** | **Max** | **Factory setting**
---|---|---
0 | 17 | 0

**Description:**
Sets the input terminal for direct measuring probe 1.

The direct measuring probe can either be parameterized as a non-cyclic (value 1 ... 8) or a cyclic (value 11 ... 18) measuring probe.
After it has been activated via BI: p2509 = 0/1 signal, the non-cyclic measuring probe measures once and can be used with EPOS.

After it has been activated via the p2509 = 1 signal, the cyclic measuring probe measures cyclically and cannot be used with EPOS.

In order to process signals faster, the direct measuring probe bypasses the handshake technique via the encoder control word and encoder status word.

**Value:**

0: No measuring probe
1: DI/DO 9 (X132.2)
2: DI/DO 10 (X132.3)
3: DI/DO 11 (X132.4)
7: DI/DO 8 (X132.1)
11: DI/DO 9 cyclic
12: DI/DO 10 cyclic
13: DI/DO 11 cyclic
17: DI/DO 8 cyclic

**Index:**

[0] = Encoder 1
[1] = Encoder 2
[2] = Reserved

**Dependency:**

Refer to: p0490, p0728, p2509, p2510, p2511

**Note:**

DI/DO: Bidirectional Digital Input/Output

The terminal must be set as input (p0728).

If a parameter change is rejected, a check should be performed as to whether the input terminal is already being used in p0488, p0489, p0493, p0494, p0495, p0580 or p0680.

Direct measurement via p2517 has a higher priority than measurements via p0488.

For the direct measuring probe evaluation, the DP clock cycle must be integer multiple of the position controller clock cycle.

**p2518[0...2]**

**Description:**

Sets the input terminal for direct measuring probe 2.

The direct measuring probe can either be parameterized as a non-cyclic (value 1 ... 6) or a cyclic (value 11 ... 16) measuring probe.

After it has been activated via BI: p2509 = 0/1 signal, the non-cyclic measuring probe measures once and can be used with EPOS.

After it has been activated via the p2509 = 1 signal, the cyclic measuring probe measures cyclically and cannot be used with EPOS.

In order to process signals faster, the direct measuring probe bypasses the handshake technique via the encoder control word and encoder status word.

**Value:**

0: No measuring probe
1: DI/DO 9 (X132.2)
2: DI/DO 10 (X132.3)
3: DI/DO 11 (X132.4)
7: DI/DO 8 (X132.1)
11: DI/DO 9 cyclic
12: DI/DO 10 cyclic
13: DI/DO 11 cyclic
17: DI/DO 8 cyclic

**Index:**

[0] = Encoder 1
[1] = Encoder 2
[2] = Reserved

**Dependency:**

Refer to: p0490, p0728, p2509, p2510, p2511
**Note:**

DI/DO: Bidirectional Digital Input/Output
The terminal must be set as input (p0728).

If a parameter change is rejected, a check should be performed as to whether the input terminal is already being used in p0488, p0489, p0493, p0494, p0495, p0580 or p0680.

Direct measurement via p2518 has a higher priority than measurements via p0489.
For the direct measuring probe evaluation, the DP clock cycle must be integer multiple of the position controller clock cycle.

### p2519[0...n]

**LR position actual value preprocessing config, DDS changeover / s_act config DDS**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed:</td>
<td>U, T</td>
</tr>
<tr>
<td>Data type:</td>
<td>Integer16</td>
</tr>
<tr>
<td>Dynamic index:</td>
<td>DDS, p0180</td>
</tr>
<tr>
<td>Units group:</td>
<td>-</td>
</tr>
<tr>
<td>Unit selection:</td>
<td>-</td>
</tr>
<tr>
<td>Scaling:</td>
<td>-</td>
</tr>
<tr>
<td>Expert list:</td>
<td>1</td>
</tr>
<tr>
<td>Access level:</td>
<td>4</td>
</tr>
</tbody>
</table>

**SERVO_S110-CAN (Pos ctrl), SERVO_S110-DP (Pos ctrl), SERVO_S110-PN (Pos ctrl)**

**Description:**

Sets the behavior of the position actual value preprocessing for the position controller for a DDS changeover.
Re p2519 = 1:

In the following cases, for a DDS changeover, the actual position actual value becomes invalid and the reference point is reset:
- the EDS effective for the closed-loop position control changes.
- the encoder assignment changes (p2502).
- the mechanical relationships change (p2503 ... p2506).
- the direction of rotation changes (p1821).

For absolute encoders, the status of the adjustment (p2507) is also reset if the same absolute encoder remains selected for the closed-loop position control, but the mechanical relationships or the direction of rotation have changed.

In the operation state, in addition, a fault (F07494) is generated.

**Notice:**

The remaining setting values are intended for expanded functionality.

**Note:**

The behavior for a DDS changeover is determined using the value of p2519 in the target data set.

### r2520[0...2]

**CO: LR Position actual value preprocessing, encoder control word / ActVal_prep STW**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed:</td>
<td>-</td>
</tr>
<tr>
<td>Data type:</td>
<td>Unsigned16</td>
</tr>
<tr>
<td>Dynamic index:</td>
<td>-</td>
</tr>
<tr>
<td>Units group:</td>
<td>-</td>
</tr>
<tr>
<td>Unit selection:</td>
<td>-</td>
</tr>
<tr>
<td>Scaling:</td>
<td>-</td>
</tr>
<tr>
<td>Expert list:</td>
<td>1</td>
</tr>
<tr>
<td>Access level:</td>
<td>1</td>
</tr>
</tbody>
</table>

**SERVO_S110-CAN (Pos ctrl), SERVO_S110-DP (Pos ctrl), SERVO_S110-PN (Pos ctrl)**

**Description:**

Displays the encoder control word generated by the position actual value preprocessing.

**Index:**

0 = Encoder 1
1 = Encoder 2
2 = Reserved

**Bit field:**

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Request function 1</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>01</td>
<td>Request function 2</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>02</td>
<td>Request function 3</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>03</td>
<td>Request function 4</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>04</td>
<td>Request command bit 0</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>05</td>
<td>Request command bit 1</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>06</td>
<td>Request command bit 2</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>07</td>
<td>Flying measurement mode/search for reference mark</td>
<td>Flying measurement</td>
<td>Reference marks</td>
<td>-</td>
</tr>
<tr>
<td>13</td>
<td>Request absolute value cyclic</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
</tbody>
</table>
List of parameters

14 Request parking encoder  Yes  No  -  
15 Request acknowledge encoder fault  Yes  No  -  

Dependency:  Refer to: p0480
Note:  When the function module "basic positioner" (r0108.4 = 1) is activated, the following BICO interconnection is established:


\textbf{r2521[0...3]}  \begin{tabular}{l} 
\textbf{CO: LR position actual value / s\_act} \\
\textbf{SERVO\_S110-CAN} (Pos ctrl),  \\
\textbf{SERVO\_S110-DP} (Pos ctrl),  \\
\textbf{SERVO\_S110-PN} (Pos ctrl)  \\
\end{tabular}

\begin{tabular}{lll}
Can be changed: & - & Calculated: -  \\
Data type: & Integer32 & Dynamic index: -  \\
P-Group: & Closed loop position control & Units group: -  \\
Not for motor type: & - & Scaling: -  \\
\end{tabular}

\begin{tabular}{lll}
Min & - [LU]  \\
Max & - [LU]  \\
Factory setting & - [LU]  \\
\end{tabular}

Description:  Displays the actual position actual value determined by the position actual value preprocessing.
Index:  
\begin{align*}
[0] &= \text{Closed-loop position control} \\
[1] &= \text{Encoder 1} \\
[2] &= \text{Encoder 2} \\
[3] &= \text{Reserved}  \\
\end{align*}

Dependency:  Refer to: p2502, r2526
Note:  
\begin{align*}
r2526.0 &= 1 \rightarrow \text{The position actual value in r2521[0] for the position control is valid.}  \\
r2527.0 &= 1 \rightarrow \text{The position actual value in r2521[1] for encoder 1 is valid.}  \\
r2528.0 &= 1 \rightarrow \text{The position actual value in r2521[2] for encoder 2 is valid.}  \\
\end{align*}

\textbf{r2522[0...3]}  \begin{tabular}{l} 
\textbf{CO: LR velocity actual value / v\_act} \\
\textbf{SERVO\_S110-CAN} (Pos ctrl),  \\
\textbf{SERVO\_S110-DP} (Pos ctrl),  \\
\textbf{SERVO\_S110-PN} (Pos ctrl)  \\
\end{tabular}

\begin{tabular}{lll}
Can be changed: & - & Calculated: -  \\
Data type: & Integer32 & Dynamic index: -  \\
P-Group: & Closed loop position control & Units group: -  \\
Not for motor type: & - & Scaling: -  \\
\end{tabular}

\begin{tabular}{lll}
Min & - [1000 LU/min]  \\
Max & - [1000 LU/min]  \\
Factory setting & - [1000 LU/min]  \\
\end{tabular}

Description:  Displays the velocity actual value determined by the position actual value preprocessing.
Index:  
\begin{align*}
[0] &= \text{Closed-loop position control} \\
[1] &= \text{Encoder 1} \\
[2] &= \text{Encoder 2} \\
[3] &= \text{Reserved}  \\
\end{align*}

Dependency:  Refer to: p2502, r2526
Note:  
\begin{align*}
r2526.0 &= 1 \rightarrow \text{The velocity actual value in r2522[0] for the position control is valid.}  \\
r2527.0 &= 1 \rightarrow \text{The velocity actual value in r2522[1] for encoder 1 is valid.}  \\
r2528.0 &= 1 \rightarrow \text{The velocity actual value in r2522[2] for encoder 2 is valid.}  \\
\end{align*}

\textbf{r2523[0...3]}  \begin{tabular}{l} 
\textbf{CO: LR measured value / Measured value}  \\
\textbf{SERVO\_S110-CAN} (Pos ctrl),  \\
\textbf{SERVO\_S110-DP} (Pos ctrl),  \\
\textbf{SERVO\_S110-PN} (Pos ctrl)  \\
\end{tabular}

\begin{tabular}{ll}
Can be changed: & -  \\
Data type: & Integer32  \\
P-Group: & Closed loop position control  \\
Not for motor type: & -  \\
\end{tabular}

\begin{tabular}{ll}
Min & - [LU]  \\
Max & - [LU]  \\
Factory setting & - [LU]  \\
\end{tabular}

Description:  Displays the value determined by the function "reference mark search" and "measuring probe evaluation".
Index:  
\begin{align*}
[0] &= \text{Closed-loop position control} \\
[1] &= \text{Encoder 1}  \\
\end{align*}
**Parameter**

**List of parameters**

[r2526.2 = 1 --> The measured value in r2523[0] for the position control is valid.]

[r2527.2 = 1 --> The measured value in r2523[1] for encoder 1 is valid.]

[r2528.2 = 1 --> The measured value in r2523[2] for encoder 2 is valid.]

---

### r2524

**CO: LR revolution / LU/revolution**

**Description:** Displays the internal length units LU/motor revolution.

**Dependency:** Refer to: p0404

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Unit</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>r2524</td>
<td></td>
<td></td>
<td>Displays the internal length units LU/motor revolution.</td>
</tr>
</tbody>
</table>

---

### 2525[0...n]

**CO: LR encoder adjustment, offset / Enc_adj offset**

**Description:** For the absolute encoder adjustment, a drive determines the position offset.

**Dependency:** Refer to: p0404

**Note:** The position offset is only relevant for absolute encoders. The drive determines it when making the adjustment and the user should not change it.

---

### r2526.0...9

**CO/BO: LR status word / ZSW**

**Description:** Displays the status word of the position controller.

<table>
<thead>
<tr>
<th>Bit field</th>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>00</td>
<td>Position actual value valid</td>
<td>Yes</td>
<td>No</td>
<td>4010, 4015</td>
</tr>
<tr>
<td>01</td>
<td>01</td>
<td>Referencing active</td>
<td>Yes</td>
<td>No</td>
<td>4010</td>
</tr>
<tr>
<td>02</td>
<td>02</td>
<td>Measured value valid</td>
<td>Yes</td>
<td>No</td>
<td>3615, 4010</td>
</tr>
<tr>
<td>03</td>
<td>03</td>
<td>Closed-loop position control active</td>
<td>Yes</td>
<td>No</td>
<td>4015</td>
</tr>
<tr>
<td>04</td>
<td>04</td>
<td>Fixed stop reached</td>
<td>Yes</td>
<td>No</td>
<td>3617, 4025</td>
</tr>
<tr>
<td>05</td>
<td>05</td>
<td>Fixed stop outside window</td>
<td>Yes</td>
<td>No</td>
<td>3617, 4025</td>
</tr>
<tr>
<td>06</td>
<td>06</td>
<td>Position controller output limited</td>
<td>Yes</td>
<td>No</td>
<td>4015</td>
</tr>
<tr>
<td>07</td>
<td>07</td>
<td>Request tracking mode</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>08</td>
<td>08</td>
<td>Clamping active when traveling to fixed stop</td>
<td>Yes</td>
<td>No</td>
<td>4025</td>
</tr>
<tr>
<td>09</td>
<td>09</td>
<td>Setting value for adjustment valid</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
</tbody>
</table>
Dependency:  Refer to: r2521, r2522, r2523
Note:  Re bit 04:  The signal is influenced via p2634.
Re bit 05:  The signal is influenced via p2635.

r2527.0...2  CO/BO: LR actual value sensing status word encoder 1 / ActValSensZSW enc1

SERVO_S110-CAN (Pos ctrl),
SERVO_S110-DP (Pos ctrl),
SERVO_S110-PN (Pos ctrl)

Can be changed: -  Calculated: -  Access level: 1
Data type: Unsigned16  Dynamic index: -  Func. diagram: -
P-Group: Closed loop position control  Units group: -  Unit selection: -
Not for motor type: -  Scaling: -  Expert list: 1

Min  Max  Factory setting
-  -  -

Description: Displays the status word of the position actual value sensing for encoder 1.

Bit field:  Bit  Signal name  1 signal  0 signal  FP
00  Position actual value valid  Yes  No  -
01  Referencing active  Yes  No  -
02  Measured value valid  Yes  No  -

r2528.0...2  CO/BO: LR actual value sensing status word encoder 2 / ActValSensZSW enc2

SERVO_S110-CAN (Pos ctrl),
SERVO_S110-DP (Pos ctrl),
SERVO_S110-PN (Pos ctrl)

Can be changed: -  Calculated: -  Access level: 1
Data type: Unsigned16  Dynamic index: -  Func. diagram: -
P-Group: Closed loop position control  Units group: -  Unit selection: -
Not for motor type: -  Scaling: -  Expert list: 1

Min  Max  Factory setting
-  -  -

Description: Displays the status word of the position actual value sensing for encoder 2.

Bit field:  Bit  Signal name  1 signal  0 signal  FP
00  Position actual value valid  Yes  No  -
01  Referencing active  Yes  No  -
02  Measured value valid  Yes  No  -

p2530  CI: LR position setpoint / s_set

SERVO_S110-CAN (Pos ctrl),
SERVO_S110-DP (Pos ctrl),
SERVO_S110-PN (Pos ctrl)

Can be changed: T  Calculated: -  Access level: 1
Data type: Unsigned32 / Integer32  Dynamic index: -  Func. diagram: 4015, 4020
P-Group: Closed loop position control  Units group: -  Unit selection: -
Not for motor type: -  Scaling: -  Expert list: 1

Min  Max  Factory setting
-  0  -

Description: Sets the signal source for the position setpoint of the position controller.
Dependency: Refer to: r2665
Note: When the function module "basic positioner" (r0108.4 = 1) is activated, the following BICO interconnection is established: BI: p2530 = r2665
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p2531 CI: LR velocity setpoint / v_set</td>
<td>Sets the signal source for the velocity setpoint of the position controller.</td>
<td>Refer to: r2666</td>
<td>When the function module &quot;basic positioner&quot; (r0108.4 = 1) is activated, the following BICO interconnection is established: BI: p2531 = r2666</td>
</tr>
<tr>
<td>p2532 CI: LR position actual value / s_act</td>
<td>Sets the signal source for the position actual value of the position controller.</td>
<td>Refer to: r2521</td>
<td></td>
</tr>
<tr>
<td>p2533[0...n] LR position setpoint filter, time constant / s_set_filt T</td>
<td>Sets the time constant for the position setpoint filter (PT1).</td>
<td></td>
<td>The effective Kv factor (position loop gain) is reduced with the filter. This allows a softer control behavior with improved tolerance with respect to noise/disturbances. Applications: - reduces the pre-control dynamic response. - jerk limiting.</td>
</tr>
<tr>
<td>p2534[0...n] LR speed pre-control factor / n_prectrl fact</td>
<td>Setting to activate and weight the speed pre-control value.</td>
<td>Refer to: p2535, p2536, r2563</td>
<td>When the axis control loop is optimally set as well as a precisely determined equivalent time constant of the speed control loop, the pre-control factor is 100%.</td>
</tr>
</tbody>
</table>
List of parameters

**p2535[0...n] LR speed pre-control balancing filter dead time / n_prectrFlt t_dead**

**SERVO_S110-CAN**
**SERVO_S110-DP**
**SERVO_S110-PN**

**Description:** Sets the "fractional" dead time to emulate the timing behavior of the speed control loop.

The selected multiplier refers to the position controller clock cycle (deadtime= p2535 * p0115[4]).

**Dependency:** Refer to: p2536

**Notice:** When speed pre-control is active (p2534 > 0 %), the following applies:
In addition to the set dead time (p2535), internally two position controller clock cycles are effective.
When speed pre-control is inactive (p2534 = 0 %), the following applies:
No dead time is effective (p2535 and internal).

**Note:** Together with p2536, the timing behavior of the closed-loop control loop can be emulated.

**Min**: 0.00
**Max**: 2.00
**Factory setting**: 0.00

**p2536[0...n] LR speed pre-control, symmetrizing filter PT1 / n_prectrl filt PT1**

**SERVO_S110-CAN**
**SERVO_S110-DP**
**SERVO_S110-PN**

**Description:** Sets a PT1 filter to emulate the timing behavior of the closed-speed control loop.

**Dependency:** Refer to: p2535

**Notice:** When speed pre-control is inactive (p2534 = 0 %), the following applies:
If a PT1 filter has been set, it is not effective.

**Note:** Together with p2535, the timing behavior of the closed-loop control loop can be emulated.

**Min**: 0.00 [ms]
**Max**: 100.00 [ms]
**Factory setting**: 0.00 [ms]

**p2537 CI: LR position controller adaptation / Adaptation**

**SERVO_S110-CAN**
**SERVO_S110-DP**
**SERVO_S110-PN**

**Description:** Sets the signal source for the adaptation of the proportional gain of the position controller.

**Dependency:** Refer to: p2538

**Min**: -
**Max**: -
**Factory setting**: 1

**p2538[0...n] LR proportional gain / Kp**

**SERVO_S110-CAN**
**SERVO_S110-DP**
**SERVO_S110-PN**

**Description:** Sets the proportional gain (P gain, position loop gain, Kv factor) of the position controller.

**Dependency:** Refer to: p2537, p2539, p2555, r2557, r2558

**Min**: 0.000 [1000/min]
**Max**: 300.000 [1000/min]
**Factory setting**: 1.000 [1000/min]
**Note:**
The proportional gain is used to define at which traversing velocity the following error is obtained (without pre-control).
Low proportional gain:
Slow response to a setpoint - actual value difference, the following error becomes large.
High proportional gain:
Fast response to the setpoint - actual value difference, the following error becomes small.

### p2539[0...n] LR integral time / Tn
**Description:**
Setting to activate the integral time of the position controller.
Value = 0 ms → The I component of the position controller is de-activated.

**Dependency:**
Refer to: p2538, r2559

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Value</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min</td>
<td>[ms]</td>
<td>0.00</td>
<td>0.00 [ms]</td>
</tr>
<tr>
<td>Max</td>
<td>[ms]</td>
<td>10000.00</td>
<td>0.00 [ms]</td>
</tr>
</tbody>
</table>

### p2540 CO: LR position controller output, speed limit / LR_outp limit
**Description:**
Sets the speed limit of the position controller output.

**Dependency:**
Refer to: p2541

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Value</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min</td>
<td>[rpm]</td>
<td>0.000</td>
<td>210000.000 [rpm]</td>
</tr>
<tr>
<td>Max</td>
<td>[rpm]</td>
<td>210000.000</td>
<td>210000.000 [rpm]</td>
</tr>
</tbody>
</table>

### p2541 CI: LR position controller output, speed limit signal source / LR_outp lim S_src
**Description:**
Sets the signal source for the position controller output limit.

**Dependency:**
Refer to: p2540

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Value</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min</td>
<td>-</td>
<td>-</td>
<td>2540[0]</td>
</tr>
<tr>
<td>Max</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

### p2542 LR standstill window / Standstill window
**Description:**
Sets the standstill window for the standstill monitoring function.
After the standstill monitoring time expires, it is cyclically checked whether the difference between the setpoint and actual position is located within the standstill window and, if required, an appropriate fault is output.
Value = 0 → The standstill monitoring is de-activated.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Value</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min</td>
<td>[LU]</td>
<td>0</td>
<td>200 [LU]</td>
</tr>
<tr>
<td>Max</td>
<td>[LU]</td>
<td>2147483647</td>
<td>2147483647 [LU]</td>
</tr>
</tbody>
</table>
Dependency:
Refer to: p2543, p2544
Refer to: F07450

Note:
The following applies for the setting of the standstill and positioning window:
Standstill window (p2542) >= positioning window (p2544)

### p2543
**LR standstill monitoring time / t_standstill_monit**

| SERVO_S110-CAN (Pos ctrl), SERVO_S110-DP (Pos ctrl), SERVO_S110-PN (Pos ctrl) |
| Can be changed: U, T | Calculated: - | Access level: 1 |
| Data type: FloatingPoint32 | Dynamic index: - | Func. diagram: 4020 |
| P-Group: Closed loop position control | Units group: - | Unit selection: - |
| Not for motor type: - | Scaling: - | Expert list: 1 |

**Min** | **Max** | **Factory setting**
--- | --- | ---
0.00 [ms] | 100000.00 [ms] | 200.00 [ms]

**Description:**
Sets the standstill monitoring time for the standstill monitoring function.
After the standstill monitoring time expires, it is cyclically checked whether the difference between the setpoint and actual position is located within the standstill window and, if required, an appropriate fault is output.

**Dependency:**
Refer to: p2542, p2545
Refer to: F07450

**Note:**
The following applies for the setting of the standstill and positioning monitoring time:
Standstill monitoring time (p2543) <= positioning monitoring time (p2545)

### p2544
**LR positioning window / Pos_window**

| SERVO_S110-CAN (Pos ctrl), SERVO_S110-DP (Pos ctrl), SERVO_S110-PN (Pos ctrl) |
| Can be changed: U, T | Calculated: - | Access level: 1 |
| Data type: Unsigned32 | Dynamic index: - | Func. diagram: 4020 |
| P-Group: Closed loop position control | Units group: - | Unit selection: - |
| Not for motor type: - | Scaling: - | Expert list: 1 |

**Min** | **Max** | **Factory setting**
--- | --- | ---
0 [LU] | 2147483647 [LU] | 40 [LU]

**Description:**
Sets the positioning window for the positioning monitoring function.
After the positioning monitoring time expires, it is checked once as to whether the difference between the setpoint and actual position lies within the positioning window and if required an appropriate fault is output.
Value = 0 --> The positioning monitoring function is de-activated.

**Dependency:**
Refer to: p2542, p2545, r2684
Refer to: F07451

**Note:**
The following applies for the setting of the standstill and positioning window:
Standstill window (p2542) >= positioning window (p2544)

### p2545
**LR positioning monitoring time / t_pos_monit**

| SERVO_S110-CAN (Pos ctrl), SERVO_S110-DP (Pos ctrl), SERVO_S110-PN (Pos ctrl) |
| Can be changed: U, T | Calculated: - | Access level: 1 |
| Data type: FloatingPoint32 | Dynamic index: - | Func. diagram: 4020 |
| P-Group: Closed loop position control | Units group: - | Unit selection: - |
| Not for motor type: - | Scaling: - | Expert list: 1 |

**Min** | **Max** | **Factory setting**
--- | --- | ---
0.00 [ms] | 100000.00 [ms] | 1000.00 [ms]

**Description:**
Sets the positioning monitoring time for the positioning monitoring.
After the positioning monitoring time expires, it is checked once as to whether the difference between the setpoint and actual position lies within the positioning window and if required an appropriate fault is output.

**Dependency:**
Refer to: p2543, p2544, r2684
Refer to: F07451

**Note:**
The following applies for the setting of the standstill and positioning monitoring time:
Standstill monitoring time (p2543) <= positioning monitoring time (p2545)
### List of Parameters

#### p2546[0...n]
**LR dynamic following error monitoring tolerance / s_delta_monit_tol**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN (Pos ctrl), SERVO_S110-DP (Pos ctrl), SERVO_S110-PN (Pos ctrl)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can be changed: U, T</td>
<td>Sets the tolerance for the dynamic following error monitoring.</td>
<td>Calculated: -</td>
<td>Access level: 1</td>
</tr>
<tr>
<td>Data type: Unsigned32</td>
<td>If the dynamic following error (r2563) exceeds the selected tolerance, then an appropriate fault is output.</td>
<td>Dynamic index: DDS, p0180</td>
<td>Func. diagram: 4025</td>
</tr>
<tr>
<td>P-Group: Closed loop position control</td>
<td>Value = 0 → The dynamic following error monitoring is de-activated.</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td></td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
<td></td>
<td>0 [LU]</td>
<td></td>
</tr>
<tr>
<td>Max</td>
<td></td>
<td>2147483647 [LU]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1000 [LU]</td>
<td></td>
</tr>
</tbody>
</table>

#### p2547
**LR cam switching position 1 / Cam position 1**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN (Pos ctrl), SERVO_S110-DP (Pos ctrl), SERVO_S110-PN (Pos ctrl)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can be changed: U, T</td>
<td>Sets the cam switching position 1.</td>
<td>Calculated: -</td>
<td>Access level: 1</td>
</tr>
<tr>
<td>Data type: Integer32</td>
<td>Only after the axis has been referenced can it be guaranteed that the cam switching signals when output have a &quot;true&quot; position reference.</td>
<td>Dynamic index: -</td>
<td>Func. diagram: 4025</td>
</tr>
<tr>
<td>P-Group: Closed loop position control</td>
<td></td>
<td>Units group: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td></td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
<td></td>
<td>-2147483648 [LU]</td>
<td></td>
</tr>
<tr>
<td>Max</td>
<td></td>
<td>2147483647 [LU]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>0 [LU]</td>
<td></td>
</tr>
</tbody>
</table>

#### p2548
**LR cam switching position 2 / Cam position 2**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN (Pos ctrl), SERVO_S110-DP (Pos ctrl), SERVO_S110-PN (Pos ctrl)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can be changed: U, T</td>
<td>Sets the cam switching position 2.</td>
<td>Calculated: -</td>
<td>Access level: 1</td>
</tr>
<tr>
<td>Data type: Integer32</td>
<td>Only after the axis has been referenced can it be guaranteed that the cam switching signals when output have a &quot;true&quot; position reference.</td>
<td>Dynamic index: -</td>
<td>Func. diagram: 4025</td>
</tr>
<tr>
<td>P-Group: Closed loop position control</td>
<td></td>
<td>Units group: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td></td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
<td></td>
<td>-2147483648 [LU]</td>
<td></td>
</tr>
<tr>
<td>Max</td>
<td></td>
<td>2147483647 [LU]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>0 [LU]</td>
<td></td>
</tr>
</tbody>
</table>
### List of parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p2549</td>
<td>Sets the signal source for the position controller enable 1.</td>
<td>Refer to: r0899, p2550</td>
<td>The position controller is enabled by ANDing BI: p2549 and BI: p2550.</td>
</tr>
<tr>
<td>p2550</td>
<td>Sets the signal source for the position controller enable 2.</td>
<td>Refer to: p2549</td>
<td>The position controller is enabled by ANDing BI: p2549 and BI: p2550. When the function module &quot;closed-loop position control&quot; or &quot;basic positioner&quot; is activated, the following BICO interconnection is established: BI: p2550 = 1</td>
</tr>
<tr>
<td>p2551</td>
<td>Sets the signal source for the &quot;setpoint present&quot; signal. BI: p2551 = 1 signal: The end of the positioning operation on the setpoint side is signaled and the positioning and standstill monitoring activated. BI: p2551 = 0 signal: The start of a positioning operation or tracking mode on the setpoint side is signaled and the positioning and standstill monitoring de-activated.</td>
<td>Refer to: p2554, r2683</td>
<td>When the function module &quot;basic positioner&quot; (r0108.4 = 1) is activated, the following BICO interconnection is established: BI: p2551 = r2683.2</td>
</tr>
</tbody>
</table>
### p2552 BI: LR signal travel to fixed stop active / Signal TfS act

| Description: | Sets the signal source for the signal "travel to fixed stop active". BI: p2552 = 1 signal: The activity associated with travel to fixed stop is signaled and the detection of the fixed stop is started via the maximum following error (p2634). |
| Dependency: | Refer to: r2683 |
| Note: | When the function module "basic positioner" (r0108.4 = 1) is activated, the following BICO interconnection is established: BI: p2552 = r2683.14 |

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed:</td>
<td>T</td>
</tr>
<tr>
<td>Calculated:</td>
<td>-</td>
</tr>
<tr>
<td>Access level:</td>
<td>1</td>
</tr>
<tr>
<td>Data type:</td>
<td>Unsigned32 / Binary</td>
</tr>
<tr>
<td>Dynamic index:</td>
<td>-</td>
</tr>
<tr>
<td>Func. diagram:</td>
<td>4025</td>
</tr>
<tr>
<td>P-Group:</td>
<td>Closed loop position control</td>
</tr>
<tr>
<td>Units group:</td>
<td>-</td>
</tr>
<tr>
<td>Unit selection:</td>
<td>-</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
</tr>
<tr>
<td>Scaling:</td>
<td>-</td>
</tr>
<tr>
<td>Expert list:</td>
<td>1</td>
</tr>
<tr>
<td>Min</td>
<td>-</td>
</tr>
<tr>
<td>Max</td>
<td>0</td>
</tr>
<tr>
<td>Factory setting:</td>
<td>-</td>
</tr>
</tbody>
</table>

### p2553 BI: LR signal fixed stop reached / Signal fixed stop

| Description: | Sets the signal source for the signal "fixed stop reached". BI: p2553 = 1 signal: When the fixed stop is reached, this is signaled and the fixed stop monitoring window is activated. |
| Dependency: | Refer to: r2683 |
| Note: | When the function module "basic positioner" (r0108.4 = 1) is activated, the following BICO interconnection is established: BI: p2553 = r2683.12 |

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed:</td>
<td>T</td>
</tr>
<tr>
<td>Calculated:</td>
<td>-</td>
</tr>
<tr>
<td>Access level:</td>
<td>1</td>
</tr>
<tr>
<td>Data type:</td>
<td>Unsigned32 / Binary</td>
</tr>
<tr>
<td>Dynamic index:</td>
<td>-</td>
</tr>
<tr>
<td>Func. diagram:</td>
<td>4025</td>
</tr>
<tr>
<td>P-Group:</td>
<td>Closed loop position control</td>
</tr>
<tr>
<td>Units group:</td>
<td>-</td>
</tr>
<tr>
<td>Unit selection:</td>
<td>-</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
</tr>
<tr>
<td>Scaling:</td>
<td>-</td>
</tr>
<tr>
<td>Expert list:</td>
<td>1</td>
</tr>
<tr>
<td>Min</td>
<td>-</td>
</tr>
<tr>
<td>Max</td>
<td>0</td>
</tr>
<tr>
<td>Factory setting:</td>
<td>-</td>
</tr>
</tbody>
</table>

### p2554 BI: LR signal traversing command active / Sig trav_cmnd act

| Description: | Sets the signal source for the signal "traversing command active". BI: p2554 = 1 signal: It is signaled that positioning is active and therefore the positioning monitoring is not activated with the signal "set-point present" (p2551). |
| Dependency: | Refer to: p2551, r2684 |
| Note: | When the function module "basic positioner" (r0108.4 = 1) is activated, the following BICO interconnection is established: BI: p2554 = r2684.15 |

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed:</td>
<td>T</td>
</tr>
<tr>
<td>Calculated:</td>
<td>-</td>
</tr>
<tr>
<td>Access level:</td>
<td>1</td>
</tr>
<tr>
<td>Data type:</td>
<td>Unsigned32 / Binary</td>
</tr>
<tr>
<td>Dynamic index:</td>
<td>-</td>
</tr>
<tr>
<td>Func. diagram:</td>
<td>4020</td>
</tr>
<tr>
<td>P-Group:</td>
<td>Closed loop position control</td>
</tr>
<tr>
<td>Units group:</td>
<td>-</td>
</tr>
<tr>
<td>Unit selection:</td>
<td>-</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
</tr>
<tr>
<td>Scaling:</td>
<td>-</td>
</tr>
<tr>
<td>Expert list:</td>
<td>1</td>
</tr>
<tr>
<td>Min</td>
<td>-</td>
</tr>
<tr>
<td>Max</td>
<td>0</td>
</tr>
<tr>
<td>Factory setting:</td>
<td>-</td>
</tr>
</tbody>
</table>
**p2555**  
**Parameter**: CI: LR LU/revolution LU/mm / LU/rev LU/mm  
**Description**: Sets the signal source for the reference of the internal length units LU to motor revolution for rotary encoders and to mm for linear encoders.  
**Dependency**: Refer to: p0404, r2524  
**Note**: The signal value is used to convert the length unit to the speed or velocity setpoint.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>r2556</td>
<td>CO: LR position setpoint after setpoint smoothing / s_set after interp</td>
<td></td>
</tr>
<tr>
<td>r2557</td>
<td>CO: LR position controller input, system deviation / LR_inp sys dev</td>
<td></td>
</tr>
<tr>
<td>r2558</td>
<td>CO: LR position controller output, P component / LR_outp P comp</td>
<td></td>
</tr>
<tr>
<td>r2559</td>
<td>CO: LR position controller output, I component / LR_outp I comp</td>
<td></td>
</tr>
</tbody>
</table>

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SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3  
1-373
### List of parameters

#### r2560
**CO: LR speed setpoint / n_set**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN (Pos ctrl), SERVO_S110-DP (Pos ctrl), SERVO_S110-PN (Pos ctrl)</td>
<td>Displays the speed setpoint after limiting (CI: p2541).</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>

**Min** | **Max** | **Factory setting** |
--- | --- | --- |
- [rpm] | - [rpm] | - [rpm] |

#### r2561
**CO: LR speed pre-control value / n_prectrl val**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN (Pos ctrl), SERVO_S110-DP (Pos ctrl), SERVO_S110-PN (Pos ctrl)</td>
<td>Displays the speed setpoint due to the pre-control.</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>

**Min** | **Max** | **Factory setting** |
--- | --- | --- |
- [rpm] | - [rpm] | - [rpm] |

#### r2562
**CO: LR total speed setpoint / n_set total**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN (Pos ctrl), SERVO_S110-DP (Pos ctrl), SERVO_S110-PN (Pos ctrl)</td>
<td>Displays the total speed setpoint. This value is obtained from the sum of the speed pre-control and position controller output.</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>

**Dependency:** Refer to: r2560, r2561

#### r2563
**CO: LR following error dynamic model / Follow error dyn**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN (Pos ctrl), SERVO_S110-DP (Pos ctrl), SERVO_S110-PN (Pos ctrl)</td>
<td>Displays the dynamic following error. This value is the deviation, corrected by the velocity-dependent component, between the position setpoint and the position actual value.</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>

**Note:**
For p2534 >= 100 % (pre-control activated) the following applies:
The dynamic following error (r2563) corresponds to the system deviation (r2557) at the position controller input. For 0 % < p2534 < 100 % (pre-control activated) or p2534 = 0 % (pre-control de-activated) the following applies:
The dynamic following error (r2563) is the deviation between the measured position actual value and a value that is calculated from the position setpoint via a PT1 model. This compensates the system-related velocity-dependent system deviation for a P controller.
### List of parameters

#### r2564

**CO: LR torque pre-control value / M_prectrl_val**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>r2564</td>
<td>Displays the torque pre-control value.</td>
<td>Refer to: p1511, p1512</td>
<td>The torque pre-control value is the derivation over time of the speed pre-control value and is referred to a moment of inertia of 1 kgm²/2 PI. When using the pre-control, then this should be evaluated corresponding to the actual moment of inertia.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Can be changed:</th>
<th>Data type:</th>
<th>P-Group:</th>
<th>Not for motor type:</th>
</tr>
</thead>
<tbody>
<tr>
<td>r2564</td>
<td>-</td>
<td>FloatingPoint32</td>
<td>Closed loop position control</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>r2564</td>
<td>- [Nm]</td>
<td>- [Nm]</td>
<td></td>
</tr>
</tbody>
</table>

#### r2565

**CO: LR following error actual / Following err act**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Notice:</th>
<th>Notice:</th>
</tr>
</thead>
<tbody>
<tr>
<td>r2565</td>
<td>Displays the actual following error.</td>
<td>This value is the deviation between the position setpoint - after fine interpolation - and the position actual value.</td>
<td>When speed pre-control is active (p2534 &gt; 0 %), the following applies:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Can be changed:</th>
<th>Data type:</th>
<th>P-Group:</th>
<th>Not for motor type:</th>
</tr>
</thead>
<tbody>
<tr>
<td>r2565</td>
<td>-</td>
<td>Integer32</td>
<td>Closed loop position control</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>r2565</td>
<td>- [LU]</td>
<td>- [LU]</td>
<td></td>
</tr>
</tbody>
</table>

#### r2566

**LR speed input pre-control / n inp prectrl**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Note:</th>
</tr>
</thead>
<tbody>
<tr>
<td>r2566</td>
<td>Displays the speed at the input of the pre-control channel.</td>
<td>This display parameter is used for diagnostics even when the pre-control is inactive (p2534 = 0%).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Can be changed:</th>
<th>Data type:</th>
<th>P-Group:</th>
<th>Not for motor type:</th>
</tr>
</thead>
<tbody>
<tr>
<td>r2566</td>
<td>-</td>
<td>FloatingPoint32</td>
<td>Closed loop position control</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>r2566</td>
<td>- [rpm]</td>
<td>- [rpm]</td>
<td></td>
</tr>
</tbody>
</table>

#### p2567[0...n]

**LR torque pre-control moment of inertia / M_prectr_M_inertia**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description:</th>
<th>Dependency:</th>
</tr>
</thead>
<tbody>
<tr>
<td>p2567</td>
<td>Sets the moment of inertia for the torque pre-control.</td>
<td>Refer to: p2534, r2564</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Can be changed:</th>
<th>Data type:</th>
<th>P-Group:</th>
<th>Not for motor type:</th>
</tr>
</thead>
<tbody>
<tr>
<td>p2567</td>
<td>U, T</td>
<td>FloatingPoint32</td>
<td>Closed loop position control</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p2567</td>
<td>0.000000 [kgm²]</td>
<td>100000.000000 [kgm²]</td>
<td>0.159155 [kgm²]</td>
</tr>
</tbody>
</table>
Note: When calculating the torque pre-control value \( r_{2654} \), the time derivation of the speed pre-control value is multiplied by \( 2 \pi \times p_{2567} \).

For reasons associated with the compatibility to earlier firmware versions, the factory setting for \( p_{2567} = 1 \text{ kgm}^2/2 \pi \). This means that \( CO: r_{2564} \) remains as standard the derivation over time of the speed pre-control value and is referred, as before, to a moment of inertia of \( 1 \text{ kgm}^2/2 \pi \). For torque pre-control, the moment of inertia can now be directly entered into \( p_{2567} \) (instead of subsequently evaluating the pre-control value).

p2568

**BI: EPOS STOP cam activation / STOP cam act**

- **Can be changed:** T
- **Data type:** Unsigned32 / Binary
- **P-Group:** Basic positioner
- **Not for motor type:** -

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>0</td>
</tr>
</tbody>
</table>

**Description:** Sets the signal source to activate the function "STOP cam".

**Dependency:** Refer to: \( p_{2569}, p_{2570} \)

**Note:**

- The traversing range can also be limited using software limit switches.

p2569

**BI: EPOS STOP cam minus / STOP cam minus**

- **Can be changed:** T
- **Data type:** Unsigned32 / Binary
- **P-Group:** Basic positioner
- **Not for motor type:** -

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>

**Description:** Sets the signal source for the STOP cam in the negative direction of travel.

**Recommend.:**

- Set the OFF3 ramp-down time \( (p_{1135}) \), so that the axis, after reaching the STOP cam at the maximum velocity, does not move through a higher braking travel than is actually available.
- Sets message 07491 as alarm \( (A07491) \):
  - Set the maximum deceleration \( (p_{2573}) \), so that the axis, after reaching the STOP cam at the maximum velocity, does not move through a higher braking travel than is actually available.

**Dependency:**

- Refer to: \( p_{1135}, p_{2568}, p_{2570}, p_{2573}, r_{2684} \)
- Refer to: F07491

**Caution:**

- The STOP cams are low active.
- Sets message 07491 as fault \( (F07491) \):

  - For a 0 signal, the axis is stopped with the OFF3 ramp-down time \( (p_{1135}) \), status signal \( r_{2684.13} \) is set to 1, saved and the appropriate fault is output. After the fault has been acknowledged, only motion moving away from the STOP cam is permitted.

  - For a 0/1 signal and valid travel direction, when the stop cam is exited, this is detected and the status signal \( r_{2684.13} \) is set to 0.

  - Sets message 07491 as alarm \( (A07491) \):

    - For a 0 signal, the axis is stopped with the maximum deceleration \( (p_{2573}) \), status signal \( r_{2684.13} \) is set to 1, saved and the appropriate alarm is output. Only motion away from the STOP cam is permitted.

    - For a 0/1 signal and valid travel direction, when the stop cam is exited, this is detected and the status signal \( r_{2684.13} \) is set to 0 and the alarm is deleted.
### Parameter

#### List of parameters

**p2570**

**BI: EPOS STOP cam plus / STOP cam plus**

- **Can be changed:** T
- **Data type:** Unsigned32 / Binary
- **P-Group:** Basic positioner
- **Not for motor type:** -

<table>
<thead>
<tr>
<th>Description</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sets the signal source for the STOP cam in the positive direction of travel.</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>

**Recommend.:**

Set the OFF3 ramp-down time (p1135), so that the axis, after reaching the STOP cam at the maximum velocity, does not move through a higher braking travel than is actually available.

Sets message 07492 as alarm (A07492):

Set the maximum deceleration (p2573), so that the axis, after reaching the STOP cam at the maximum velocity, does not move through a higher braking travel than is actually available.

**Dependency:**

Refer to: p1135, p2568, p2569, p2573, r2684

Refer to: F07492

**Caution:**

The STOP cams are low active.

Sets message 07492 as fault (F07492):

For a 0 signal, the axis is stopped with the OFF3 ramp-down time (p1135), status signal r2684.14 is set to 1, saved and the appropriate fault is output. After the fault has been acknowledged, only motion moving away from the STOP cam is permitted.

For a 0/1 signal and valid travel direction, when the stop cam is exited, this is detected and the status signal r2684.14 is set to 0.

Sets message 07492 as alarm (A07492):

For a 0 signal, the axis is stopped with the maximum deceleration (p2573), status signal r2684.14 is set to 1, saved and the appropriate alarm is output. Only motion away from the STOP cam is permitted.

For a 0/1 signal and valid travel direction, when the stop cam is exited, this is detected and the status signal r2684.14 is set to 0 and the alarm is deleted.

**p2571**

**EPOS maximum velocity / v_max**

- **Can be changed:** U, T
- **Data type:** Unsigned32
- **P-Group:** Basic positioner
- **Not for motor type:** -

<table>
<thead>
<tr>
<th>Description</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sets the maximum velocity for the function module &quot;basic positioner&quot; (r0108.4).</td>
<td>1 [1000 LU/min]</td>
<td>40000000 [1000 LU/min]</td>
<td>30000 [1000 LU/min]</td>
</tr>
</tbody>
</table>

**Dependency:**

Refer to: r1084, r1087, p2503, p2504, p2505, p2506

**Note:**

The maximum velocity is active in all of the operating modes of the basic positioner.

The maximum velocity for the basic positioner should be aligned with the maximum speed/velocity of the speed/velocity controller:

- **Rotary encoders:**
  
  \[ p2571[1000 \text{ LU/min}] = \min(|r1084|, |r1087|)[\text{rpm}] \times p2505/p2504 \times p2506/1000 \]

- **Linear encoders:**
  
  \[ p2571[1000 \text{ LU/min}] = \min(|r1084|, |r1087|)[\text{m/min}] \times p2503/10[\text{m}] \]
### Parameter

#### List of parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>p2572</strong></td>
<td>EPOS maximum acceleration / (a_{\text{max}})</td>
<td>Can be changed: T</td>
<td>The maximum acceleration appears to exhibit jumps (without jerk).</td>
</tr>
<tr>
<td>SERVO_S110-CAN (EPOS), SERVO_S110-DP (EPOS), SERVO_S110-PN (EPOS)</td>
<td>Calculated: -</td>
<td>The programmed acceleration override (p2619) acts on the maximum acceleration.</td>
<td></td>
</tr>
<tr>
<td><strong>p2573</strong></td>
<td>EPOS maximum deceleration / (-a_{\text{max}})</td>
<td>Can be changed: T</td>
<td>The programmed deceleration override (p2620) acts on the maximum deceleration.</td>
</tr>
<tr>
<td>SERVO_S110-CAN (EPOS), SERVO_S110-DP (EPOS), SERVO_S110-PN (EPOS)</td>
<td>Calculated: -</td>
<td>The deceleration override is effective (p2644, 4000 hex = 100 %).</td>
<td></td>
</tr>
<tr>
<td><strong>p2574</strong></td>
<td>EPOS jerk limiting / Jerk lim</td>
<td>Can be changed: U, T</td>
<td>No acceleration override is active. The axis starts with the maximum acceleration.</td>
</tr>
<tr>
<td>SERVO_S110-CAN (EPOS), SERVO_S110-DP (EPOS), SERVO_S110-PN (EPOS)</td>
<td>Calculated: -</td>
<td>No deceleration override is effective. The axis breaks with the maximum deceleration.</td>
<td></td>
</tr>
</tbody>
</table>

#### p2572 EPOS maximum acceleration / \(a_{\text{max}}\)

**SERVO_S110-CAN (EPOS), SERVO_S110-DP (EPOS), SERVO_S110-PN (EPOS)**

- **Min**: 1 [1000 LU/s²]
- **Max**: 2000000 [1000 LU/s²]
- **Factory setting**: 100 [1000 LU/s²]

**Description:**
Sets the maximum acceleration for the function module "basic positioner" (r0108.4).

**Dependency:**
Refer to: p2619, p2644

**Note:**
The maximum acceleration appears to exhibit jumps (without jerk).

*Traversing blocks* operating mode:
The programmed acceleration override (p2619) acts on the maximum acceleration.

*Direct setpoint input/MDI* mode:
The acceleration override is effective (p2644, 4000 hex = 100 %).

*Jog* and "search for reference" modes
No acceleration override is active. The axis starts with the maximum acceleration.

#### p2573 EPOS maximum deceleration / \(-a_{\text{max}}\)

**SERVO_S110-CAN (EPOS), SERVO_S110-DP (EPOS), SERVO_S110-PN (EPOS)**

- **Min**: 1 [1000 LU/s²]
- **Max**: 2000000 [1000 LU/s²]
- **Factory setting**: 100 [1000 LU/s²]

**Description:**
Sets the maximum deceleration for the function module "basic positioner" (r0108.4).

**Dependency:**
Refer to: p2619, p2645

**Note:**
The maximum deceleration appears to exhibit jumps (without jerk).

*Traversing blocks* operating mode:
The programmed deceleration override (p2620) acts on the maximum deceleration.

*Direct setpoint input/MDI* mode:
The deceleration override is effective (p2645, 4000 hex = 100 %).

*Jog* and "search for reference" modes
No deceleration override is effective. The axis breaks with the maximum deceleration.

#### p2574 EPOS jerk limiting / Jerk lim

**SERVO_S110-CAN (EPOS), SERVO_S110-DP (EPOS), SERVO_S110-PN (EPOS)**

- **Min**: 1 [1000 LU/s³]
- **Max**: 100000000 [1000 LU/s³]
- **Factory setting**: 10000 [1000 LU/s³]

**Description:**
Sets the jerk limiting

**Dependency:**
Refer to: p2572, p2573, p2575

**Note:**
The jerk limiting is internally converted into a jerk time as follows:
Jerk time \(T_J = \max(p2572, p2573) / p2574\)
The jerk time is internally limited to 1000 ms and is rounded-off to an integer multiple of the sampling time positioning (p0115[5]).
The jerk time is valid for the acceleration and deceleration phases also for unequal maximum acceleration (p2572) and maximum deceleration (p2573).
For unequal maximum acceleration and maximum deceleration, the motion is not optimal from a time perspective as the jerk limit cannot be used for the lower of the two values.

If, in the traversing profile, the acceleration time without jerk limiting is less than the jerk time $T_r$, then the motion with jerk limiting is not optimum from a time perspective.

For traversing motion with a direct transition between acceleration and deceleration (i.e. jerk time is greater than the constant velocity phase), jerk can increase up to twice the parameterized jerk.

CONTINUE_FLYING with direction reversal acts internally just like a CONTINUE_WITH_STOP without the "position reached" being set. Without jerk limiting, this behavior can hardly be noticed as, when reversing, the position setpoint is only kept at zero for one interpolator clock cycle.

For block change enable CONTINUE_WITH_STOP, jerk limiting results in a longer delay time.

### p2575

**Description:**
Sets the signal source to activate the jerk limiting.
Actuating/de-activating:
- using BI: p2575 = 1 signal or 0 signal.
- using the command JERK in the traversing block (only for BI: p2575 = 0 signal).

**Dependency:**
Refer to: p2574

**Note:**
A change of the signal state at the binector input is only accepted at zero speed.

### p2576

**Description:**
Sets the modulo range for axes with modulo correction.

**Dependency:**
Refer to: p2577

### p2577

**Description:**
Sets the signal source to activate modulo correction.

**Dependency:**
Refer to: p2576

**Note:**
When the signal state changes at the binector input, this only becomes effective in the "ready to power-up" state.
Selecting modulo correction:
The current position setpoint in the modulo range is corrected. The position actual value differs from the position setpoint by the following error and can also leave the modulo range.
De-selecting modulo correction:
It is based on the current position actual value.
### p2578

**CI: EPOS software limit switch minus signal source / SW limSw Min S_src**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Access</th>
<th>Description</th>
<th>Dependency</th>
<th>Notice</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN (EPOS), SERVO_S110-DP (EPOS), SERVO_S110-PN (EPOS)</td>
<td>Can be changed: T</td>
<td>Calculated: -</td>
<td>Sets the signal source for the software limit switch minus.</td>
<td>Refer to: p2579, p2580, p2581, p2582</td>
<td>A change to the software limit switch becomes immediately effective.</td>
<td>The following applies for the setting of the software limit switch: Software limit switch minus &lt; software limit switch plus</td>
</tr>
<tr>
<td>Data type: Unsigned32 / Integer32</td>
<td>Dynamic index: -</td>
<td>Units group: -</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P-Group: Basic positioner</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-</td>
<td>-</td>
<td>2580[0]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### p2579

**CI: EPOS software limit switch plus signal source / SW limSwPlus S_src**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Access</th>
<th>Description</th>
<th>Dependency</th>
<th>Notice</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN (EPOS), SERVO_S110-DP (EPOS), SERVO_S110-PN (EPOS)</td>
<td>Can be changed: T</td>
<td>Calculated: -</td>
<td>Sets the signal source for the software limit switch plus.</td>
<td>Refer to: p2578, p2580, p2581, p2582</td>
<td>A change to the software limit switch becomes immediately effective.</td>
<td>The following applies for the setting of the software limit switch: Software limit switch minus &lt; software limit switch plus</td>
</tr>
<tr>
<td>Data type: Unsigned32 / Integer32</td>
<td>Dynamic index: -</td>
<td>Units group: -</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P-Group: Basic positioner</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-</td>
<td>-</td>
<td>2581[0]</td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### p2580

**CO: EPOS software limit switch minus / SW limSwitch minus**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Access</th>
<th>Description</th>
<th>Dependency</th>
<th>Notice</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN (EPOS), SERVO_S110-DP (EPOS), SERVO_S110-PN (EPOS)</td>
<td>Can be changed: U, T</td>
<td>Calculated: -</td>
<td>Sets the software limit switch in the negative direction of travel.</td>
<td>Refer to: p2578, p2579, p2581, p2582</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data type: Integer32</td>
<td>Dynamic index: -</td>
<td>Units group: -</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P-Group: Basic positioner</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-2147482648 [LU]</td>
<td>2147482647 [LU]</td>
<td>-2147482648 [LU]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### p2581

**CO: EPOS software limit switch plus / SW lim switch plus**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Access</th>
<th>Description</th>
<th>Dependency</th>
<th>Notice</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN (EPOS), SERVO_S110-DP (EPOS), SERVO_S110-PN (EPOS)</td>
<td>Can be changed: U, T</td>
<td>Calculated: -</td>
<td>Sets the software limit switch in the positive direction of travel.</td>
<td>Refer to: p2578, p2579, p2581, p2582</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data type: Integer32</td>
<td>Dynamic index: -</td>
<td>Units group: -</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P-Group: Basic positioner</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-2147482648 [LU]</td>
<td>2147482647 [LU]</td>
<td>2147482647 [LU]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Dependency: Refer to: p2578, p2579, p2580, p2582

**p2582**

**BIG EPOS software limit switch activation / SW lim sw act**

Can be changed: T  
Calculated: -  
Access level: 1

Data type: Unsigned32 / Binary  
Dynamic index: -  
Func. diagram: 3630

P-Group: Basic positioner  
Units group: -  
Unit selection: -

Not for motor type: -  
Scaling: -  
Expert list: 1

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>0</td>
</tr>
</tbody>
</table>

**Description:**
Sets the signal source to activate the "software limit switch".

**Dependency:**
Refer to: p2578, p2579, p2580, p2581

**Caution:**
Software limit switch effective:
- axis is referenced (r2684.11 = 1) and Bi: p2582 = 1 signal.

Software limit switch ineffective:
- modulo correction active (Bi: p2577 = 1 signal).
- search for reference is executed.

**Notice:**
Target position for relative positioning outside software limit switch:
The traversing block is started and the axis comes to a standstill at the software limit switch. An appropriate alarm is output and the traversing block is interrupted. Traversing blocks with valid position can be activated.

Target position for absolute positioning outside software limit switch:
In the "traversing blocks" mode, the traversing block is not started and an appropriate fault is output.

Axis outside the valid traversing range:
If the axis is already outside the valid traversing range, then an appropriate fault is output. The fault can be acknowledged at standstill. Traversing blocks with valid position can be activated.

**Note:**
The traversing range can also be limited using STOP cams.

---

**p2583**

**EPOS backlash compensation / Backlash comp**

Can be changed: U, T  
Calculated: -  
Access level: 1

Data type: Integer32  
Dynamic index: -  
Func. diagram: 3635

P-Group: Basic positioner  
Units group: -  
Unit selection: -

Not for motor type: -  
Scaling: -  
Expert list: 1

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-200000 [LU]</td>
<td>200000 [LU]</td>
<td>0 [LU]</td>
</tr>
</tbody>
</table>

**Description:**
Sets the amount of play (backlash) for positive or negative play.
0: The backlash compensation is de-activated.
> 0: Positive backlash (normal case)
When the direction is reversed, the encoder actual value leads the actual value.
< 0: Negative backlash
When the direction is reversed, the actual value leads the encoder actual value.

**Dependency:**
If a stationary axis is referenced by setting the reference point, or an adjusted with absolute encoder is powered up, then the setting of p2604 is relevant for entering the compensation value.
p2604 = 1:
Traveling in the positive direction -> A compensation value is immediately entered.
Traveling in the negative direction -> A compensation value is not entered
p2604 = 0:
Traveling in the positive direction -> A compensation value is not entered
Traveling in the negative direction -> A compensation value is immediately entered.

When again setting the reference point (a referenced axis) or for "flying referencing", p2604 is not relevant but instead the history of the axis.

Refer to: p2604, r2667
### p2585 EPOS jog 1 setpoint velocity / Jog 1 v_set

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN (EPOS), SERVO_S110-DP (EPOS), SERVO_S110-PN (EPOS)</td>
<td>Sets the setpoint velocity for jog 1.</td>
<td>-40000000 [1000 LU/min]</td>
<td>40000000 [1000 LU/min]</td>
<td>-300 [1000 LU/min]</td>
</tr>
</tbody>
</table>

**Description:**
Sets the setpoint velocity for jog 1.

**Dependency:**
Refer to: p2587, p2589, p2591

**Note:**
Incremental jog 1 is started with BI: p2591 = 1 signal and BI: p2589 = 0/1 signal. With BI: p2589 = 0 signal, incremental jogging is interrupted.

### p2586 EPOS jog 2 setpoint velocity / Jog 2 v_set

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN (EPOS), SERVO_S110-DP (EPOS), SERVO_S110-PN (EPOS)</td>
<td>Sets the setpoint velocity for jog 2.</td>
<td>-40000000 [1000 LU/min]</td>
<td>40000000 [1000 LU/min]</td>
<td>300 [1000 LU/min]</td>
</tr>
</tbody>
</table>

**Description:**
Sets the setpoint velocity for jog 2.

**Dependency:**
Refer to: p2588, p2590, p2591

### p2587 EPOS jog 1 traversing distance / Jog 1 distance

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN (EPOS), SERVO_S110-DP (EPOS), SERVO_S110-PN (EPOS)</td>
<td>Sets the traversing distance for incremental jog 1.</td>
<td>0 [LU]</td>
<td>2147482647 [LU]</td>
<td>1000 [LU]</td>
</tr>
</tbody>
</table>

**Description:**
Sets the traversing distance for incremental jog 1.

**Dependency:**
Refer to: p2585, p2589, p2591

**Note:**
Incremental jog 1 is started with BI: p2591 = 1 signal and BI: p2589 = 0/1 signal. With BI: p2589 = 0 signal, incremental jogging is interrupted.

### p2588 EPOS jog 2 traversing distance / Jog 2 distance

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN (EPOS), SERVO_S110-DP (EPOS), SERVO_S110-PN (EPOS)</td>
<td>Sets the traversing distance for incremental jog 2.</td>
<td>0 [LU]</td>
<td>2147482647 [LU]</td>
<td>1000 [LU]</td>
</tr>
</tbody>
</table>

**Description:**
Sets the traversing distance for incremental jog 2.

**Dependency:**
Refer to: p2586, p2590, p2591

**Note:**
Incremental jog 2 is started with BI: p2591 = 1 signal and BI: p2590 = 0/1 signal. With BI: p2590 = 0 signal, incremental jogging is interrupted.
### p2589
**Parameter: BI: EPOS jog 1 signal source / Jog 1 S_src**

| Description | Sets the signal source for jog 1. |
| Dependency | When jogging, the axis is accelerated or braked with the maximum acceleration/deceleration (p2572/p2573). BI: p2591 = 0 signal. The axis endlessly moves with the setpoint velocity, jog 1 (p2585). BI: p2591 = 1 signal. The axis traverses through a parameterized distance (p2585) with the setpoint velocity, jog 1 (p2587). Refer to: p2572, p2573, p2585, p2587, p2591 |
| Notice | The parameter may be protected as a result of p0922 or p2079 and cannot be changed. |

| Parameter | Can be changed: T | Calculated: - | Access level: 1 |
| Data type | Unsigned32 / Binary | Dynamic index: - | Func. diagram: 3610, 3625 |
| P-Group | Basic positioner | Units group: - | Unit selection: - |
| Not for motor type | - | Scaling: - | Expert list: 1 |

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>0</td>
</tr>
</tbody>
</table>

### p2590
**Parameter: BI: EPOS jog 2 signal source / Jog 2 S_src**

| Description | Sets the signal source for jog 2. |
| Dependency | When jogging, the axis is accelerated or braked with the maximum acceleration/deceleration (p2572/p2573). BI: p2591 = 0 signal. The axis endlessly moves with the setpoint velocity, jog 2 (p2586). BI: p2591 = 1 signal. The axis traverses through a parameterized distance (p2586) with the setpoint velocity, jog 2 (p2588). Refer to: p2572, p2573, p2586, p2588, p2591 |
| Notice | The parameter may be protected as a result of p0922 or p2079 and cannot be changed. |

| Parameter | Can be changed: T | Calculated: - | Access level: 1 |
| Data type | Unsigned32 / Binary | Dynamic index: - | Func. diagram: 3610, 3625 |
| P-Group | Basic positioner | Units group: - | Unit selection: - |
| Not for motor type | - | Scaling: - | Expert list: 1 |

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>0</td>
</tr>
</tbody>
</table>

### p2591
**Parameter: BI: EPOS jogging incremental / Jog incr**

| Description | Sets the signal source for jogging incremental. |
| Dependency | Refer to: p2585, p2586, p2587, p2588, p2589, p2590 |

| Parameter | Can be changed: T | Calculated: - | Access level: 1 |
| Data type | Unsigned32 / Binary | Dynamic index: - | Func. diagram: 3610 |
| P-Group | Basic positioner | Units group: - | Unit selection: - |
| Not for motor type | - | Scaling: - | Expert list: 1 |

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>0</td>
</tr>
</tbody>
</table>

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SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3
**p2593**

**CI: EPOS LU/revolution LU/mm / LU/rev LU/mm**

- **Can be changed:** T  
- **Data type:** Unsigned32 / FloatingPoint32  
- **P-Group:** Basic positioner  
- **Not for motor type:** -  
- **Min:** -  
- **Max:** 2524[0]  
- **Access level:** 3  
- **Dynamic index:** -  
- **Units group:** -  
- **Scaling:** -  
- **Expert list:** 1

**Description:** Sets the signal source for the reference of the internal length units LU to motor revolution for rotary encoders and to mm for linear encoders.

**Dependency:** Refer to: p0404, r2524, p2594

**Note:** The signal value is used to convert the length unit to the speed or velocity setpoint.

**p2594**

**CI: EPOS Maximum velocity externally limited / v_Max ext lim**

- **Can be changed:** T  
- **Data type:** Unsigned32 / FloatingPoint32  
- **P-Group:** Basic positioner  
- **Not for motor type:** -  
- **Min:** -  
- **Max:** 0  
- **Access level:** 3  
- **Dynamic index:** -  
- **Units group:** -  
- **Scaling:** p2000  
- **Expert list:** 1

**Description:** Sets the signal source for the externally limited maximum velocity.

**Dependency:** Refer to: r2524, p2571, p2593

**Warning:** In order that the externally limited velocity can be effective for the EPOS operating modes, connector input p2593 must be correctly interconnected.

**p2595**

**BI: EPOS referencing start / Ref start**

- **Can be changed:** T  
- **Data type:** Unsigned32 / Binary  
- **P-Group:** Basic positioner  
- **Not for motor type:** -  
- **Min:** -  
- **Max:** 0  
- **Access level:** 1  
- **Dynamic index:** -  
- **Units group:** -  
- **Scaling:** -  
- **Expert list:** 1

**Description:** Sets the signal source to start the "search for reference" or "flying referencing".

- BI: p2595 = 0/1 signal  
- Referencing is started.  
- BI: p2595 = 1/0 signal  
- Referencing is interrupted.

**Dependency:** Refer to: p2597, p2598, p2599, r2684

**Notice:** The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

**Note:** The reference point approach can only be activated (0/1 edge) after traversing motion that is being processed has been completed.

- With the start, where relevant, the state signal "reference point set" (r2684.11) is reset.
- Flying referencing (BI: p2597 = 1 signal):
  - With the start, the state signal "reference point set" (r2684.11) is not reset.
### p2596 BI: EPOS set reference point / Set ref_pt

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p2596</td>
<td>Sets the signal source for the &quot;set reference point&quot;.</td>
<td>Refer to: p2598, p2599, r2684</td>
<td>Reference point setting is effective in the following operating states:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- in the basic state.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- for FIXED STOP with progress condition END (corresponds to the initial state).</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- for traversing block interrupted via BI: p2640 = 0 signal (intermediate stop).</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- for EPOS not enabled (BI: p2656 = 0 signal) and position actual value valid (BI: p2658 = 1 signal).</td>
</tr>
</tbody>
</table>

### p2597 BI: EPOS referencing type selection / Ref_typ select

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p2597</td>
<td>Sets the signal source to select referencing type.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 signal: Flying referencing</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0 signal: Search for reference</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Refer to: p2595</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Referencing is activated as follows:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Select the referencing type (BI: p2597)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Start referencing (BI: p2595 = 0/1 signal)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### p2598[0...3] CI: EPOS reference point coordinate, signal source / Ref_pt coord S_src

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Access level</th>
<th>Func. diagram</th>
<th>Expert list</th>
</tr>
</thead>
<tbody>
<tr>
<td>p2598[0...3]</td>
<td>Sets the signal source for the reference point coordinate.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>This value is used as reference for the following referencing operations:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- search for reference</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- set reference point</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- flying referencing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- absolute value adjustment</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Index

- [0] = Closed-loop position control
- [1] = Encoder 1
- [2] = Encoder 2
- [3] = Reserved

### Dependency

Refer to: p2502, p2507, p2595, p2596, p2597, p2599

### Note

When the function module "basic positioner" (r0108.4 = 1) is activated, the following applies:

#### Incremental measuring system:

After the reference point is reached, the drive accepts the current axis position from the position received via the connector input CI: p2598[0].

#### Absolute encoder:

When adjusting the encoder, the position received via the connector input is set as the current axis position. The position offset to the actual encoder value is displayed in p2525.

### Description

#### p2599

CO: EPOS reference point coordinate value / Ref_pt coord val

**SERVO_S110-CAN** (Pos ctrl), **SERVO_S110-DP** (Pos ctrl), **SERVO_S110-PN** (Pos ctrl)

- Can be changed: U, T
- Data type: Integer32
- P-Group: Closed loop position control
- Not for motor type: -

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-2147482648 [LU]</td>
<td>2147482647 [LU]</td>
<td>0 [LU]</td>
</tr>
</tbody>
</table>

**Description:**

Sets the position value for the reference point coordinate.

This value is set as the current axis position after referencing or adjustment.

**Dependency:**

Refer to: p2507, p2525, p2595, p2596, p2597, p2598

#### p2600

EPOS search for reference, reference point offset / Ref_pt offset

**SERVO_S110-CAN** (EPOS), **SERVO_S110-DP** (EPOS), **SERVO_S110-PN** (EPOS)

- Can be changed: U, T
- Data type: Integer32
- P-Group: Basic positioner
- Not for motor type: -

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-2147482648 [LU]</td>
<td>2147482647 [LU]</td>
<td>0 [LU]</td>
</tr>
</tbody>
</table>

**Description:**

Sets the reference point offset for search for reference.

**Dependency:**

Refer to: p2598

#### p2601

EPOS flying referencing, inner window / Inner window

**SERVO_S110-CAN** (EPOS), **SERVO_S110-DP** (EPOS), **SERVO_S110-PN** (EPOS)

- Can be changed: U, T
- Data type: Integer32
- P-Group: Basic positioner
- Not for motor type: -

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 [LU]</td>
<td>2147482647 [LU]</td>
<td>0 [LU]</td>
</tr>
</tbody>
</table>

**Description:**

Sets the inner window for flying referencing.

**Value = 0:**

The evaluation of the inner window is de-activated.

**Dependency:**

Refer to: p2597, p2602, r2684

**Notice:**

The inner window must be set so that it is smaller than the outer window.

**Note:**

If the difference between the reference point coordinate and detected actual position is less than the inner window, then no correction is executed for a referenced axis.

If the difference between the reference point coordinate and detected actual position is greater than the inner window and less than the outer window (p2602), then a correction is executed for a referenced axis.
**p2602**  
**EPOS flying referencing, outer window / Outer window**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Calculated</th>
<th>Dynamic index</th>
<th>Access level</th>
<th>Func. diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>p2602</td>
<td>Integer32</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>3614</td>
</tr>
</tbody>
</table>

**Description:**
Sets the outer window for flying referencing.

Value = 0:
The evaluation of the outer window is de-activated.

**Dependency:**
Refer to: p2597, r2684
Refer to: A07489

**Notice:**
The inner window must be set so that it is smaller than the outer window.

**Note:**
If the difference between the reference point coordinate and detected actual position is greater than the outer window, then no correction is executed for the referenced axis. Further, an appropriate message is output and r2684.3 is set to 1.

**p2603**  
**EPOS flying referencing, positioning mode, relative / Pos_mode relative**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Calculated</th>
<th>Dynamic index</th>
<th>Access level</th>
<th>Func. diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>p2603</td>
<td>Integer32</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>3635</td>
</tr>
</tbody>
</table>

**Description:**
Sets the relative positioning mode for flying referencing.

Value = 1:
The corrected setpoint is not calculated into the traversing distance.

Value = 0:
The corrected setpoint is calculated into the traversing distance.

**Dependency:**
Refer to: p2597, p2623, p2648

**Caution:**
For p2603 = 0 the direction can change.

**p2604**  
**BI: EPOS search for reference, start direction / Srch for ref dir**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Calculated</th>
<th>Dynamic index</th>
<th>Access level</th>
<th>Func. diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>p2604</td>
<td>Unsigned32 / Binary</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>3612</td>
</tr>
</tbody>
</table>

**Description:**
Sets the signal sources for the start direction of the search for reference.

1 signal: Start in the negative direction.

0 signal: Start in the positive direction.

**Dependency:**
Refer to: p2583, p2595, p2597
Parameter
List of parameters

---

**p2605**

**EPOS search for reference, approach velocity, reference cam / v_appr ref_cam**

|-----------|-----------------|------|------------|------------|----------|-----------------|-------------------|----|-----|----------------|-----|----------------------|--------------|-----------------|

**Description:**
Sets the approach velocity to the reference cam for the search for reference.

**Dependency:**
The search for reference only starts with the approach velocity to the reference cam when there is a reference cam (p2607 = 1).
Refer to: p2595, p2597, p2604, p2606, p2607

**Note:**
When traversing to the reference cam, the velocity override is effective.
If, at the start of the search for reference, the axis is already at the reference cam, then the axis immediately starts to traverse to the zero mark.

---

**p2606**

**EPOS search for reference, reference cam, maximum distance / Ref_cam max s**

|-----------|-----------------|------|------------|------------|----------|-----------------|-------------------|----|-----|--------|-----|----------------------|--------------|-----------------|

**Description:**
Sets the maximum distance after the start of the search for reference when traversing to the reference cam.

**Dependency:**
Refer to: p2595, p2597, p2604, p2605, p2607
Refer to: F07458

**Note:**
When using a reversing cam, the maximum distance must be set appropriately long.

---

**p2607**

**EPOS search for reference, reference cam present / Ref_cam pres**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Can be changed:</th>
<th>U, T</th>
<th>Data type:</th>
<th>Unsigned8</th>
<th>P-Group:</th>
<th>Basic positioner</th>
<th>Not for motor type:</th>
<th>-</th>
<th>Min</th>
<th>0</th>
<th>Max</th>
<th>1</th>
<th>Factory setting</th>
<th>1</th>
</tr>
</thead>
</table>

**Description:**
Sets whether or not a reference cam is present for the search for reference.
Value = 1: Reference cam present.
Value = 0: No reference cam present.

**Dependency:**
Refer to: p2595, p2597, p2604, p2605, p2606

---

**p2608**

**EPOS search for reference, approach velocity, zero mark / v_appr ref_ZM**

|-----------|-----------------|------|------------|------------|----------|-----------------|-------------------|----|-----|----------------|-----|----------------------|--------------|-----------------|

**Description:**
Sets the approach velocity after detecting the reference cam to search for the zero mark for the the search for reference.
Dependency: If there is no reference cam (p2607 = 0), the search for reference immediately starts with the axis traversing to the zero mark.
Refer to: p2595, p2597, p2604, p2607, p2609, p2610

Caution: If the reference cam is not adjusted so that at each search for reference the same zero mark for synchronization is detected, then an "incorrect" axis reference point is obtained.
After the reference cam has been left, the search for the zero mark is activated with a time delay due to internal factors. This is the reason that the reference cam should be adjusted in this center between two zero marks and the approach velocity should be adapted to the distance between two zero marks.

Note: The velocity override is not effective when traversing to the zero mark.

**p2609**
**EPOS search for reference, max. distance ref. cam and zero mark / Max s ref_cam ZM**

SERVO_S110-CAN (EPOS), SERVO_S110-DP (EPOS), SERVO_S110-PN (EPOS)

<table>
<thead>
<tr>
<th>Can be changed:</th>
<th>U, T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type:</td>
<td>Unsigned32</td>
</tr>
<tr>
<td>P-Group:</td>
<td>Basic positioner</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
</tr>
</tbody>
</table>

**Description:** Sets the maximum distance after leaving the reference cam when traversing to the zero mark.

**Dependency:**
Refer to: p2595, p2597, p2604, p2607, p2608, p2610
Refer to: F07459

**p2610**
**EPOS search for ref., tol. bandwidth for distance to zero mark / Tol_band to ZM**

SERVO_S110-CAN (EPOS), SERVO_S110-DP (EPOS), SERVO_S110-PN (EPOS)

<table>
<thead>
<tr>
<th>Can be changed:</th>
<th>U, T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type:</td>
<td>Unsigned32</td>
</tr>
<tr>
<td>P-Group:</td>
<td>Basic positioner</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
</tr>
</tbody>
</table>

**Description:** Sets the tolerance bandwidth for the distance to the zero mark.
The zero mark is evaluated within the maximum distance between the reference cam and zero mark (p2609) minus the tolerance bandwidth for the distance to the zero mark (p2610).

**Dependency:**
Refer to: p2609

**p2611**
**EPOS search for reference, approach velocity, reference point / v_appr ref_pt**

SERVO_S110-CAN (EPOS), SERVO_S110-DP (EPOS), SERVO_S110-PN (EPOS)

<table>
<thead>
<tr>
<th>Can be changed:</th>
<th>U, T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type:</td>
<td>Unsigned32</td>
</tr>
<tr>
<td>P-Group:</td>
<td>Basic positioner</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
</tr>
</tbody>
</table>

**Description:** Sets the approach velocity after detecting the zero mark to approach the reference point.

**Dependency:**
Refer to: p2595, p2597, p2604, p2607, p2609, p2610

**Note:** When traversing to the reference point, the velocity override is not effective.
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Notice</th>
</tr>
</thead>
<tbody>
<tr>
<td>p2612 BI: EPOS search for reference, reference cam / Ref_cam</td>
<td>Sets the signal source for the reference cam.</td>
<td>Refer to: p2607</td>
<td>The parameter may be protected as a result of p0922 or p2079 and cannot be changed.</td>
</tr>
<tr>
<td>p2613 BI: EPOS search for reference reversing cam minus / Rev minus</td>
<td>Sets the signal source for the reversing cam in the negative direction of travel.</td>
<td>Refer to: p2614</td>
<td></td>
</tr>
<tr>
<td>p2614 BI: EPOS search for reference reversing cam plus / Rev plus</td>
<td>Sets the signal source for the reversing cam in the negative direction of travel.</td>
<td>Refer to: p2613</td>
<td></td>
</tr>
<tr>
<td>p2615 EPOS maximum number of traversing blocks / Trav_block qty max</td>
<td>Sets the maximum number of traversing blocks that are available.</td>
<td>Refer to: p2616, p2617, p2618, p2619, p2620, p2621, p2622, p2623, p2624</td>
<td></td>
</tr>
</tbody>
</table>
### p2616[0...n]
**EPOS traversing block, block number / Trav_blk, blkNo.**

<table>
<thead>
<tr>
<th>SERVO_S110-CAN (EPOS), SERVO_S110-DP (EPOS), SERVO_S110-PN (EPOS)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Can be changed:</strong> U, T</td>
</tr>
<tr>
<td><strong>Data type:</strong> Integer16</td>
</tr>
<tr>
<td><strong>P-Group:</strong> Basic positioner</td>
</tr>
<tr>
<td><strong>Not for motor type:</strong> -</td>
</tr>
</tbody>
</table>

**Description:**
Sets a block number.

-1: Invalid block number. These blocks are not taken into account.
0 ... 63: Valid block number.

**Dependency:**
The number of indices depends on p2615.

Refer to: p2615, p2617, p2618, p2619, p2620, p2621, p2622, p2623, p2624

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-1</td>
<td>63</td>
<td>-1</td>
</tr>
</tbody>
</table>

### p2617[0...n]
**EPOS traversing block position / Trav_block pos**

<table>
<thead>
<tr>
<th>SERVO_S110-CAN (EPOS), SERVO_S110-DP (EPOS), SERVO_S110-PN (EPOS)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Can be changed:</strong> U, T</td>
</tr>
<tr>
<td><strong>Data type:</strong> Integer32</td>
</tr>
<tr>
<td><strong>P-Group:</strong> Basic positioner</td>
</tr>
<tr>
<td><strong>Not for motor type:</strong> -</td>
</tr>
</tbody>
</table>

**Description:**
Sets the target position for the traversing block.

**Dependency:**
The number of indices depends on p2615.

Refer to: p2615, p2616, p2618, p2619, p2620, p2621, p2622, p2623, p2624

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-2147482648 [LU]</td>
<td>2147482647 [LU]</td>
<td>0 [LU]</td>
</tr>
</tbody>
</table>

### p2618[0...n]
**EPOS traversing block velocity / Trav_block v**

<table>
<thead>
<tr>
<th>SERVO_S110-CAN (EPOS), SERVO_S110-DP (EPOS), SERVO_S110-PN (EPOS)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Can be changed:</strong> U, T</td>
</tr>
<tr>
<td><strong>Data type:</strong> Integer32</td>
</tr>
<tr>
<td><strong>P-Group:</strong> Basic positioner</td>
</tr>
<tr>
<td><strong>Not for motor type:</strong> -</td>
</tr>
</tbody>
</table>

**Description:**
Sets the velocity for the traversing block.

**Dependency:**
The number of indices depends on p2615.

Refer to: p2615, p2616, p2617, p2619, p2620, p2621, p2622, p2623, p2624

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 [1000 LU/min]</td>
<td>40000000 [1000 LU/min]</td>
<td>600 [1000 LU/min]</td>
</tr>
</tbody>
</table>

### p2619[0...n]
**EPOS traversing block acceleration override / Trav_block a_over**

<table>
<thead>
<tr>
<th>SERVO_S110-CAN (EPOS), SERVO_S110-DP (EPOS), SERVO_S110-PN (EPOS)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Can be changed:</strong> U, T</td>
</tr>
<tr>
<td><strong>Data type:</strong> FloatingPoint32</td>
</tr>
<tr>
<td><strong>P-Group:</strong> Basic positioner</td>
</tr>
<tr>
<td><strong>Not for motor type:</strong> -</td>
</tr>
</tbody>
</table>

**Description:**
Sets the acceleration override for the traversing block.

The override refers to the maximum acceleration (p2572).

**Dependency:**
The number of indices depends on p2615.

Refer to: p2572, p2615, p2616, p2617, p2618, p2620, p2621, p2622, p2623, p2624

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0 [%]</td>
<td>100.0 [%]</td>
<td>100.0 [%]</td>
</tr>
</tbody>
</table>
**Parameter List**

### p2620[0...n]

**EPOS traversing deceleration override / Trav_block -a_over**

**SERVO_S110-CAN (EPOS), SERVO_S110-DP (EPOS), SERVO_S110-PN (EPOS)**

**Can be changed:** U, T  
**Calculated:** -  
**Access level:** 1

**Data type:** FloatingPoint32  
**Dynamic index:** p2615  
**Func. diagram:** 3616

**P-Group:** Basic positioner  
**Units group:** -  
**Unit selection:** -

**Not for motor type:** -  
**Scaling:** -  
**Expert list:** 1

**Min**  
1.0 [%]  
**Max**  
100.0 [%]  
**Factory setting**  
100.0 [%]

**Description:**
Sets the deceleration override for the traversing block.

**Dependency:**
The override refers to the maximum deceleration (p2573).

**Notice:**
If, when calculating the traversing profile, it is identified that the target position of the next block with the programmed deceleration override will not be reached without direction reversal (flying block change), then the old (current) deceleration override remains effective.

### p2621[0...n]

**EPOS traversing block task / Trav_block task**

**SERVO_S110-CAN (EPOS), SERVO_S110-DP (EPOS), SERVO_S110-PN (EPOS)**

**Can be changed:** U, T  
**Calculated:** -  
**Access level:** 1

**Data type:** Integer16  
**Dynamic index:** p2615  
**Func. diagram:** 3616

**P-Group:** Basic positioner  
**Units group:** -  
**Unit selection:** -

**Not for motor type:** -  
**Scaling:** -  
**Expert list:** 1

**Min**  
1  
**Max**  
9  
**Factory setting**  
1

**Description:**
Sets the required task for the traversing block.

**Value:**
1: POSITIONING  
2: FIXED STOP  
3: ENDLESS_POS  
4: ENDLESS_NEG  
5: WAITING  
6: GOTO  
7: SET_O  
8: RESET_O  
9: JERK

**Dependency:**
The number of indices depends on p2615.

Refer to: p2615, p2616, p2617, p2618, p2619, p2621, p2622, p2623, p2624

### p2622[0...n]

**EPOS traversing block task parameter / Trav_blck task_par**

**SERVO_S110-CAN (EPOS), SERVO_S110-DP (EPOS), SERVO_S110-PN (EPOS)**

**Can be changed:** U, T  
**Calculated:** -  
**Access level:** 1

**Data type:** Integer32  
**Dynamic index:** p2615  
**Func. diagram:** 3616

**P-Group:** Basic positioner  
**Units group:** -  
**Unit selection:** -

**Not for motor type:** -  
**Scaling:** -  
**Expert list:** 1

**Min**  
-2147483648  
2147483647  
**Max**  
2147483647  
**Factory setting**  
0

**Description:**
Sets additional information/data of the appropriate task for the traversing block.

**Dependency:**
The number of indices depends on p2615.

Refer to: p2615, p2616, p2617, p2618, p2619, p2620, p2621, p2623, p2624

**Note:**
The following should be set depending on the task:

- FIXED STOP: Clamping torque and clamping force (rotary 0...65536 [0.01 Nm], linear 0...65536 [N])
- WAIT: Delay time [ms]
- GOTO: Block number
- SET_O: 1, 2 or 3 - set direct output 1, 2 or 3 (both)
**List of parameters**

**p2623[0...n]**

**EPOS traversing block, task mode / Trav_block mode**

<table>
<thead>
<tr>
<th>SERVO_S110-CAN (EPOS);</th>
<th>Can be changed: U, T</th>
<th>Calculated: -</th>
<th>Access level: 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-DP (EPOS);</td>
<td>Data type: Unsigned16</td>
<td>Dynamic index: p2615</td>
<td>Func. diagram: 3515, 3616</td>
</tr>
<tr>
<td>SERVO_S110-PN (EPOS)</td>
<td>P-Group: Basic positioner</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td></td>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>65535</td>
<td>0</td>
</tr>
</tbody>
</table>

**Description:**
Sets the influence of the task for the traversing block.
Value = 0000 cccc bbbb aaaa
cccc: Positioning mode
cccc = 0000 --> ABSOLUTE
cccc = 0001 --> RELATIVE
cccc = 0010 --> ABS_POS (only for a rotary axis with modulo correction)
cccc = 0011 --> ABS_NEG (only for a rotary axis with modulo correction)
bbbb: Progression condition
bbbb = 0000 --> END
bbbb = 0001 --> CONTINUE WITH STOP
bbbb = 0010 --> CONTINUE FLYING
bbbb = 0011 --> CONTINUE EXTERNAL
bbbb = 0100 --> CONTINUE EXTERNAL WAIT
bbbb = 0101 --> CONTINUE EXTERNAL ALARM
aaaa: IDs
aaaa = 000x --> show/hide block (x = 0: show, x = 1: hide)

**Dependency:**
The number of indices depends on p2615.
Refer to: p2615, p2616, p2617, p2618, p2619, p2620, p2621, p2622, p2624

**p2624**

**EPOS traversing block, sorting / Trav_block sort**

<table>
<thead>
<tr>
<th>SERVO_S110-CAN (EPOS);</th>
<th>Can be changed: U, T</th>
<th>Calculated: -</th>
<th>Access level: 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-DP (EPOS);</td>
<td>Data type: Unsigned16</td>
<td>Dynamic index: -</td>
<td>Func. diagram: 3616</td>
</tr>
<tr>
<td>SERVO_S110-PN (EPOS)</td>
<td>P-Group: Basic positioner</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td></td>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

**Description:**
Sets the traversing blocks for sorting corresponding to their block number.
Procedure: Set p2624 = 0 --> 1.
Sorting is started and the parameters are automatically reset to zero once the operation has been completed.

**Dependency:**
Refer to: p2615, p2616, p2617, p2618, p2619, p2620, p2621, p2622, p2623

**Note:**
After sorting, the traversing blocks are written at the beginning of the memory in increasing sequence without any gaps.
Parameter

List of parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Access level</th>
<th>Func. diagram</th>
<th>Data type</th>
<th>Dynamic index</th>
<th>Units group</th>
<th>Expert list</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p2625</td>
<td>BI: EPOS traversing block selection, bit 0 / Trav_blk sel bit 0</td>
<td>Sets the signal source to select the traversing block, bit 0.</td>
<td>Binector inputs p2625, p2626, p2627, p2628, p2629 and p2630 are used to select one of the maximum of 64 traversing blocks. Refer to: p2626, p2627, p2628, p2629, p2630</td>
<td>1</td>
<td>3616, 3640</td>
<td>Unsigned32 / Binary</td>
<td>-</td>
<td>-</td>
<td>0</td>
</tr>
<tr>
<td>p2626</td>
<td>BI: EPOS traversing block selection, bit 1 / Trav_blk sel bit 1</td>
<td>Sets the signal source to select the traversing block, bit 1.</td>
<td>Binector inputs p2625, p2626, p2627, p2628, p2629 and p2630 are used to select one of the maximum of 64 traversing blocks. Refer to: p2626, p2627, p2628, p2629, p2630</td>
<td>1</td>
<td>3616, 3640</td>
<td>Unsigned32 / Binary</td>
<td>-</td>
<td>-</td>
<td>0</td>
</tr>
<tr>
<td>p2627</td>
<td>BI: EPOS traversing block selection, bit 2 / Trav_blk sel bit 2</td>
<td>Sets the signal source to select the traversing block, bit 2.</td>
<td>Binector inputs p2625, p2626, p2627, p2628, p2629 and p2630 are used to select one of the maximum of 64 traversing blocks. Refer to: p2626, p2627, p2628, p2629, p2630</td>
<td>1</td>
<td>3616, 3640</td>
<td>Unsigned32 / Binary</td>
<td>-</td>
<td>-</td>
<td>0</td>
</tr>
<tr>
<td>p2628</td>
<td>BI: EPOS traversing block selection, bit 3 / Trav_blk sel bit 3</td>
<td>Sets the signal source to select the traversing block, bit 3.</td>
<td>Binector inputs p2625, p2626, p2627, p2628, p2629 and p2630 are used to select one of the maximum of 64 traversing blocks. Refer to: p2626, p2627, p2628, p2629, p2630</td>
<td>1</td>
<td>3616, 3640</td>
<td>Unsigned32 / Binary</td>
<td>-</td>
<td>-</td>
<td>0</td>
</tr>
</tbody>
</table>
Parameter
List of parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>BI: EPOS traversing block selection, bit 4 / Trav_blk sel bit 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN (EPOS), SERVO_S110-DP (EPOS), SERVO_S110-PN (EPOS)</td>
<td>Can be changed: T  Calculated: -  Access level: 1</td>
</tr>
<tr>
<td>Data type: Unsigned32 / Binary  Dynamic index: -  Func. diagram: 3616, 3640</td>
<td></td>
</tr>
<tr>
<td>P-Group: Basic positioner  Units group: -  Unit selection: -</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -  Scaling: -  Expert list: 1</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Description:</td>
<td>Sets the signal source to select the traversing block, bit 4.</td>
</tr>
<tr>
<td>Dependency:</td>
<td>Binector inputs p2625, p2626, p2627, p2628, p2629 and p2630 are used to select one of the maximum of 64 traversing blocks. Refer to: p2625, p2626, p2627, p2628, p2630</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>BI: EPOS traversing block selection, bit 5 / Trav_blk sel bit 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN (EPOS), SERVO_S110-DP (EPOS), SERVO_S110-PN (EPOS)</td>
<td>Can be changed: T  Calculated: -  Access level: 1</td>
</tr>
<tr>
<td>Data type: Unsigned32 / Binary  Dynamic index: -  Func. diagram: 3616, 3640</td>
<td></td>
</tr>
<tr>
<td>P-Group: Basic positioner  Units group: -  Unit selection: -</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -  Scaling: -  Expert list: 1</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Description:</td>
<td>Sets the signal source to select the traversing block, bit 5.</td>
</tr>
<tr>
<td>Dependency:</td>
<td>Binector inputs p2625, p2626, p2627, p2628, p2629 and p2630 are used to select one of the maximum of 64 traversing blocks. Refer to: p2625, p2626, p2627, p2628, p2629</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>BI: EPOS activate traversing task (0 -&gt; 1) / Trav_task act</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN (EPOS), SERVO_S110-DP (EPOS), SERVO_S110-PN (EPOS)</td>
<td>Can be changed: T  Calculated: -  Access level: 1</td>
</tr>
<tr>
<td>Data type: Unsigned32 / Binary  Dynamic index: -  Func. diagram: 3616, 3625</td>
<td></td>
</tr>
<tr>
<td>P-Group: Basic positioner  Units group: -  Unit selection: -</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -  Scaling: -  Expert list: 1</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Description:</td>
<td>Sets the signal source for &quot;activating traversing task&quot;. BI: p2631 = 0/1 signal</td>
</tr>
<tr>
<td>The traversing task, selected using BI: p2625 ... p2630, is started.</td>
<td></td>
</tr>
<tr>
<td>Dependency:</td>
<td>Refer to: p2625, p2626, p2627, p2628, p2629, p2630, p2640, p2641</td>
</tr>
<tr>
<td>Notice:</td>
<td>The parameter may be protected as a result of p0922 or p2079 and cannot be changed.</td>
</tr>
<tr>
<td>Note:</td>
<td>To start a traversing block, the axis must be referenced (r2684.11 = 1). The status signal r2684.12 = 0/1 signal is used for acknowledgement. A traversing task can be influenced using the following signals:</td>
</tr>
<tr>
<td>- intermediate stop via BI: p2640.</td>
<td></td>
</tr>
<tr>
<td>- reject traversing task via BI: p2641.</td>
<td></td>
</tr>
</tbody>
</table>
### p2632  EPOS external block change evaluation / Ext BlckChg eval

**Description:**
Sets the mode to evaluate "external block change".

**Value:**
- 0: External block change via the measuring probe
- 1: External block change via BI: p2633

**Dependency:**
Refer to: p2623, p2633, r2677, r2678

**Note:**
In the mode "external block change via measuring probe (p2632 = 0), the following applies:
When starting a traversing block with the block change enable CONTINUE_EXTERNAL, CONTINUE_EXTERNAL_WAIT and CONTINUE_EXTERNAL_ALARM an activated "flying referencing" is interrupted. After ending the block, "flying referencing" must be re-activated via BI: p2595 = 0/1 signal.

### p2633  BI: EPOS external block change (0 -> 1) / Ext BlckChg (0->1)

**Description:**
Sets the signal source for "external block change".

**Value:**
- 0: The evaluation of the signal is only active p2632 = 1.
- 1: Reference to: p2623, p2632, p2640, p2641, r2677, r2678

**Dependency:**
The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

**Note:**
A 0/1 edge initiates a flying block change in the subsequent traversing block.
When the external block change is identified, the actual position is saved in r2678.
A traversing task can be influenced using the following signals:
- intermediate stop via BI: p2640.
- reject traversing task via BI: p2641.

### p2634[0...n]  EPOS fixed stop maximum following error / Following err max

**Description:**
Sets the following error to detect the "fixed stop reached" state (r2526.4).

**Dependency:**
Refer to: r2526, p2621, r2675

**Note:**
The state "fixed stop reached" is detected if the following error exceeds the theoretically calculated following error value by p2634.
### Parameter List

#### p2635 EPOS fixed stop monitoring window / Fixed stop monit

- **Description:** Sets the monitoring window of the actual position after the fixed stop is reached.
- **Dependency:** Refer to: r2526, r2683
- **Note:** If, after the fixed stop is reached, the end stop shifts in either the positive or negative direction by more than the value set here, then BO: r2526.5 is set to 1 and an appropriate message is output.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Can be changed</th>
<th>Data type</th>
<th>P-Group</th>
<th>Not for motor type</th>
<th>Access level</th>
<th>Dynamic index</th>
<th>Units group</th>
<th>Scaling</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p2635</td>
<td>EPOS fixed stop monitoring window / Fixed stop monit</td>
<td>U, T</td>
<td>Unsigned32</td>
<td>Closed loop position control</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>0 [LU]</td>
<td>Max</td>
<td>2147482647 [LU]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### p2637 BI: EPOS fixed stop reached / Fixed stop reached

- **Description:** Sets the signal source for the feedback signal "fixed stop reached".
- **Dependency:** Refer to: r2526, r2683
- **Note:** The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Can be changed</th>
<th>Data type</th>
<th>P-Group</th>
<th>Not for motor type</th>
<th>Access level</th>
<th>Dynamic index</th>
<th>Units group</th>
<th>Scaling</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p2637</td>
<td>BI: EPOS fixed stop reached / Fixed stop reached</td>
<td>T</td>
<td>Unsigned32 / Binary</td>
<td>Basic positioner</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2526.4</td>
</tr>
<tr>
<td>Min</td>
<td>-</td>
<td>Max</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### p2638 BI: EPOS fixed stop outside the monitoring window / Fixed stop outside

- **Description:** Sets the signal source for the feedback signal "fixed stop outside the monitoring window".
- **Dependency:** Refer to: r2526, r2683
- **Note:** The identification of "fixed stop outside the monitoring window" is, for the factory setting, dependent on signal BO: r2526.5 (fixed stop outside window). This signal is influenced via p2635 (EPOS fixed stop monitoring window).

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Can be changed</th>
<th>Data type</th>
<th>P-Group</th>
<th>Not for motor type</th>
<th>Access level</th>
<th>Dynamic index</th>
<th>Units group</th>
<th>Scaling</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p2638</td>
<td>BI: EPOS fixed stop outside the monitoring window / Fixed stop outside</td>
<td>T</td>
<td>Unsigned32 / Binary</td>
<td>Basic positioner</td>
<td>-</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2526.5</td>
</tr>
<tr>
<td>Min</td>
<td>-</td>
<td>Max</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3
Parameter

List of parameters

**p2639**

__BI: EPOS torque limit reached / M_limit reached__

**SERVO_S110-CAN (EPOS), SERVO_S110-DP (EPOS), SERVO_S110-PN (EPOS)__

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>1407.7</td>
</tr>
</tbody>
</table>

**Description:** Sets the signal source for the feedback signal "torque limit reached" when traversing to fixed stop.

- BI: p2639 = 1 signal
  - Torque limit is reached.
- BI: p2639 = 0 signal
  - Torque limit is not reached.

**Dependency:** Refer to: r1407

**Note:** The feedback signal from "torque limit reached" is, for the factory setting, dependent on the signal BO: r1407.7 (torque limit reached).

**p2640**

__BI: EPOS intermediate stop (0 signal) / Intermediate stop__

**SERVO_S110-CAN (EPOS), SERVO_S110-DP (EPOS), SERVO_S110-PN (EPOS)__

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>0</td>
</tr>
</tbody>
</table>

**Description:** Sets the signal source for the "no intermediate stop/intermediate stop".

- BI: p2640 = 1 signal
  - No intermediate stop.
- BI: p2640 = 0 signal
  - Intermediate stop.

**Dependency:** Refer to: p2631, p2641, p2647, p2649

**Caution:** For BI: p2649 = 1 signal, the following applies:
- Motion starts without any explicit control signal.

**Note:** The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

**Notice:** This signal is only effective in the modes "traversing blocks" and "direct setpoint input/MDI".

When activating the intermediate stop, the axis brakes with the parameterized deceleration (p2620 or p2645).

**p2641**

__BI: EPOS reject traversing task (0 signal) / Trav_task reject__

**SERVO_S110-CAN (EPOS), SERVO_S110-DP (EPOS), SERVO_S110-PN (EPOS)__

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>0</td>
</tr>
</tbody>
</table>

**Description:** Sets the signal source for "do not reject traversing task/reject traversing task".

- BI: p2641 = 1 signal
  - Do not reject traversing task.
- BI: p2641 = 0 signal
  - Reject traversing task.

**Dependency:** Refer to: p2631, p2640, p2647, p2649
### Caution:
For BI: p2649 = 1 signal, the following applies:
Motion starts without any explicit control signal.

### Notice:
The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

### Note:
This signal is only effective in the modes "traversing blocks" and "direct setpoint input/MDI".
When activating reject traversing tasks, then the axis brakes with the maximum deceleration (p2573).

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Notice</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p2642 CI: EPOS direct setpoint input/MDI position setpoint / MDI s_set</td>
<td>Sets the signal source for the position setpoint in the mode &quot;direct setpoint input/MDI&quot;.</td>
<td>Refer to: p2648, p2649, p2650, p2690</td>
<td>The parameter may be protected as a result of p0922 or p2079 and cannot be changed.</td>
<td>Depending on p2649, the position setpoint is either transferred continuously or edge-triggered. The position setpoint input is interpreted as length unit [LU].</td>
</tr>
<tr>
<td>p2643 CI: EPOS direct setpoint input/MDI velocity setpoint / MDI v_set</td>
<td>Sets the signal source for the velocity setpoint in the &quot;direct setpoint input/MDI mode&quot;.</td>
<td>Refer to: p2649, p2650, p2691</td>
<td>The parameter may be protected as a result of p0922 or p2079 and cannot be changed.</td>
<td>Depending on p2649, the velocity setpoint is either transferred continuously or edge-triggered. The velocity setpoint input is interpreted as [1000 LU/min].</td>
</tr>
<tr>
<td>p2644 CI: EPOS direct setpoint input/MDI acceleration override / MDI a_over</td>
<td>Sets the signal source for the acceleration override in the operating mode &quot;direct setpoint input/MDI&quot;.</td>
<td>Refer to: p2649, p2650, p2692</td>
<td>The parameter may be protected as a result of p0922 or p2079 and cannot be changed.</td>
<td>Depending on p2649, the acceleration override is either transferred continuously or edge-triggered. The signal value 4000 hex (16384 dec) corresponds to 100 %.</td>
</tr>
</tbody>
</table>
### p2645

**CI: EPOS direct setpoint input/MDI deceleration override / MDI -a_over**

**Description:**
Sets the signal source for the deceleration override in the operating mode "direct setpoint input/MDI".

**Dependency:**
Refer to: p2649, p2650, p2693

**Notice:**
If, when calculating the traversing profile, it is identified that the target position with the programmed deceleration override cannot be reached without reversing the direction, then when accepting the dynamic values, the larger deceleration override is accepted and becomes effective.

The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

**Note:**
Depending on p2649, the deceleration override is either transferred continuously or edge-triggered.

The signal value 4000 hex (16384 dec) corresponds to 100 %.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min</td>
<td>-</td>
</tr>
<tr>
<td>Max</td>
<td>-</td>
</tr>
<tr>
<td>Factory setting</td>
<td>2693[0]</td>
</tr>
</tbody>
</table>

### p2646

**CI: EPOS velocity override / v_over**

**Description:**
Sets the signal source for the velocity override.

This velocity override is effective in the following operating modes "direct setpoint input/MDI", "traversing blocks", "jogging" and "search for reference" (when approaching the reference cam).

**Dependency:**
Refer to: p2571, p2586, p2606, p2618, p2643, r2681

**Notice:**
The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

**Note:**
The effective override (r2681) can differ from the specified override due to limits (e.g. maximum velocity).

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min</td>
<td>-</td>
</tr>
<tr>
<td>Max</td>
<td>-</td>
</tr>
</tbody>
</table>

### p2647

**BI: EPOS direct setpoint input/MDI selection / MDI selection**

**Description:**
Sets the signal source for selecting the operating mode "direct setpoint input/MDI".

**Dependency:**
Refer to: p2640, p2642, p2643, p2644, p2645, p2646, p2648, p2649, p2650, p2651, p2652, p2653

**Note:**
In this mode, using BI: p2653 it is possible to make a flying changeover between setting-up and positioning.

In this mode, even if the axis is not referenced (r2684.11 = 0) relative positioning is possible.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min</td>
<td>-</td>
</tr>
<tr>
<td>Max</td>
<td>0</td>
</tr>
</tbody>
</table>

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### p2648
**BI: EPOS direct setpoint input/MDI positioning type / MDI pos_type**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p2648: SERVO_S110-CAN (EPOS), SERVO_S110-DP (EPOS), SERVO_S110-PN (EPOS)</td>
<td>Sets the signal source for the positioning type in the mode &quot;direct setpoint input/MDI&quot;.</td>
<td>-</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Dependency:**
- Refer to: p2649, p2650, p2654
- Refer to: A07461, F07488

**Notice:**
- **Absolute positioning:**
  - To traverse, the reference point must be set (r2684.11 = 1).
- **Relative positioning:**
  - To traverse, it is not necessary that the reference point is set.

**Note:**
Depending on p2649, the positioning type is either transferred continuously or edge-triggered.

**Binector input p2648 is only evaluated when connector input p2654 = 0. If p2654 is a value other than 0, the positioning type is evaluated by means of the set signal source.**

### p2649
**BI: EPOS direct setpoint input/MDI transfer type selection / MDI trans_type sel**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p2649: SERVO_S110-CAN (EPOS), SERVO_S110-DP (EPOS), SERVO_S110-PN (EPOS)</td>
<td>Sets the signal source to define how values are transferred in the operating mode &quot;direct setpoint input/MDI&quot;.</td>
<td>-</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Dependency:**
- Refer to: p2642, p2644, p2645, p2646, p2650, p2651, p2652

**Caution:**
- For BI: p2649 = 1 signal, the following applies:
  - Motion starts without any explicit control signal.

**Note:**
Parameter p2649 can only be changed when p0922 (p2079) = 999.

### p2650
**BI: EPOS direct setpoint input/MDI setpoint acceptance edge / MDI setp_accept**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p2650: SERVO_S110-CAN (EPOS), SERVO_S110-DP (EPOS), SERVO_S110-PN (EPOS)</td>
<td>Sets the signal source to accept the values for edge-triggered selection (BI: p2649 = 0 signal) in the operating mode &quot;direct setpoint input/MDI&quot;.</td>
<td>-</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Dependency:**
- Refer to: p2642, p2644, p2645, p2646, p2650, p2651, p2652

**Caution:**
- For BI: p2649 = 1 signal, the following applies:
  - Motion starts without any explicit control signal.

**Note:**
Parameter p2649 can only be changed when p0922 (p2079) = 999.
BI: p2650 = 0/1 signal and BI: p2649 = 0 signal
Values are accepted, edge-triggered (refer to parameter under dependency).

Dependency:
Refer to: p2640, p2641, p2642, p2643, p2644, p2645, p2646, p2647, p2651, p2652, r2684

Notice:
The parameter may be protected as a result of p0922 or p2079 and cannot be changed.
The status signal r2684.12 = 0/1 signal is used for acknowledgement.

Note:
The status signal r2684.12 = 0/1 signal is used for acknowledgement.
- intermediate stop via BI: p2640.
- reject traversing task via BI: p2641.

### p2651
**BI: EPOS direct setpoint input/MDI direction selection, positive / MDI dir_sel pos**

| SERVO_S110-CAN (EPOS), SERVO_S110-DP (EPOS), SERVO_S110-PN (EPOS) |
| Can be changed: T |
| Data type: Unsigned32 / Binary |
| P-Group: Basic positioner |
| Not for motor type: - |

**Description:**
Sets the signal source for the positive direction selection in the operating mode "direct setpoint input/MDI".

**Dependency:**
Refer to: p2576, p2648, p2649, p2650, p2652, p2653, p2654

**Note:**
The following applies for "setting-up":
- the traversing direction can be entered using this binector input.
- if both directions (p2651, p2652) are selected, then the axis remains stationary (zero speed).
- if both directions (p2651, p2652) are de-selected, then the axis remains stationary (zero speed).

The following applies for "positioning":
Using binector inputs p2651 and p2652, when the modulo correction (BI: p2577 = 1 signal) is activated and for absolute positioning (BI: p2648 = 1 signal), the traversing direction is specified as follows:
BI: p2651 / BI: p2652
0 signal / 0 signal: Absolute positioning through the shortest distance.
1 signal / 0 signal: Absolute positioning in the positive direction.
0 signal / 1 signal: Absolute positioning in the negative direction.
1 signal / 1 signal: Absolute positioning through the shortest distance.

**Can be changed:**
T

**Calculated:**
- Access level: 1

**Dynamic index:**
- Fun. diagram: 3620

**Units group:**
- Unit selection: -

**Scaling:**
- Expert list: 1

**Min**
- **Max**
- **Factory setting**
0

### p2652
**BI: EPOS direct setpoint input/MDI direction selection, negative / MDI dir_sel neg**

| SERVO_S110-CAN (EPOS), SERVO_S110-DP (EPOS), SERVO_S110-PN (EPOS) |
| Can be changed: T |
| Data type: Unsigned32 / Binary |
| P-Group: Basic positioner |
| Not for motor type: - |

**Description:**
Sets the signal source for the negative direction selection in the operating mode "direct setpoint input/MDI".

**Dependency:**
Refer to: p2576, p2648, p2649, p2650, p2651, p2653, p2654

**Note:**
The following applies for "setting-up":
- the traversing direction can be entered using this binector input.
- if both directions (p2651, p2652) are selected, then the axis remains stationary (zero speed).
- if both directions (p2651, p2652) are de-selected, then the axis remains stationary (zero speed).

The following applies for "positioning":
Using binector inputs p2651 and p2652, when the modulo correction (BI: p2577 = 1 signal) is activated and for absolute positioning (BI: p2648 = 1 signal), the traversing direction is specified as follows:
BI: p2651 / BI: p2652
0 signal / 0 signal: Absolute positioning through the shortest distance.
1 signal / 0 signal: Absolute positioning in the positive direction.
0 signal / 1 signal: Absolute positioning in the negative direction.
1 signal / 1 signal: Absolute positioning through the shortest distance.

**Can be changed:**
T

**Calculated:**
- Access level: 1

**Dynamic index:**
- Fun. diagram: 3620

**Units group:**
- Unit selection: -

**Scaling:**
- Expert list: 1

**Min**
- **Max**
- **Factory setting**
0
### p2653
**BI: EPOS direct setpoint input/MDI setting-up selection / MDI setting-up selection**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN (EPOS), SERVO_S110-DP (EPOS), SERVO_S110-PN (EPOS)</td>
<td>Can be changed: T</td>
</tr>
<tr>
<td>Data type: Unsigned32 / Binary</td>
<td>Calculated: -</td>
</tr>
<tr>
<td>P-Group: Basic positioner</td>
<td>Dynamic index: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Units group: -</td>
</tr>
<tr>
<td>Scoring: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Expert list: 1</td>
<td>Access level: 1</td>
</tr>
</tbody>
</table>

### Description:
- Sets the signal source for setting-up in the operating mode "direct setpoint input/MDI".
- BI: p2653 = 1 signal
- Setting-up selected.
- BI: p2653 = 0 signal
- Positioning selected.

### Dependency:
Refer to: p2651, p2652

### Note:
- In the operating mode "direct setpoint input/MDI", it is possible to make a flying changeover between setting-up and positioning.
- For "setup" (BI: p2653 = 1 signal), the following applies:
  - A traversing direction must be selected via binector inputs p2651 and p2652.

---

### p2654
**CI: EPOS direct setpoint input/MDI mode adaptation / MDI mode adaptation**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN (EPOS), SERVO_S110-DP (EPOS), SERVO_S110-PN (EPOS)</td>
<td>Can be changed: T</td>
</tr>
<tr>
<td>Data type: Unsigned32 / Integer16</td>
<td>Calculated: -</td>
</tr>
<tr>
<td>P-Group: Basic positioner</td>
<td>Dynamic index: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Units group: -</td>
</tr>
<tr>
<td>Scoring: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Expert list: 1</td>
<td>Access level: 1</td>
</tr>
</tbody>
</table>

### Description:
- Sets the signal source to interconnect the MDI mode to the operating mode "direct setpoint input MDI" via PROFI-BUS telegram 110.
- CI: p2654 = 0
  - The binector inputs listed below are evaluated.
- CI: p2654 > 0
  - The following binector inputs are not evaluated:
    - BI: p2648 (positioning type)
    - BI: p2651 (direction selection, positive)
    - BI: p2652 (direction selection, negative)
- In this case, the following definitions apply:
  - Signal via CI: p2654 = xx0x hex -> absolute
  - Signal via CI: p2654 = xx1x hex -> relative
  - Signal via CI: p2654 = xx2x hex -> abs_pos (only for modulo correction)
  - Signal via CI: p2654 = xx3x hex -> abs_neg (only for modulo correction)

### Dependency:
Refer to: p2648, p2651, p2652
### p2655[0...1]

<table>
<thead>
<tr>
<th><strong>BI: EPOS select tracking mode / Sel tracking mode</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SERVO_S110-CAN (EPOS), SERVO_S110-DP (EPOS), SERVO_S110-PN (EPOS)</strong></td>
</tr>
<tr>
<td><strong>Can be changed:</strong> T</td>
</tr>
<tr>
<td><strong>Data type:</strong> Unsigned32 / Binary</td>
</tr>
<tr>
<td><strong>P-Group:</strong> Basic positioner</td>
</tr>
<tr>
<td><strong>Not for motor type:</strong> -</td>
</tr>
<tr>
<td><strong>Min</strong></td>
</tr>
<tr>
<td>-</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

**Description:**
Sets the signal source to select tracking mode.
- BI: p2655[0] or BI: p2655[1] = 1 signal
- Tracking mode after withdrawing the enable signal from EPOS (BI: p2656 = 0 signal).
- No tracking mode after withdrawing the enable signal from EPOS (BI: p2656 = 0 signal).

**Dependency:**
Refer to: p2656

**Notice:**
The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

**Note:**
For the following events, independent of the signal that is present, tracking mode is selected:
- after booting.
- after a 0/1 signal at BI: p2658 (EPOS position actual value, valid feedback signal).
- while a fault is present.

### p2656

<table>
<thead>
<tr>
<th><strong>BI: EPOS enable basic positioner / EPOS enable</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SERVO_S110-CAN (EPOS), SERVO_S110-DP (EPOS), SERVO_S110-PN (EPOS)</strong></td>
</tr>
<tr>
<td><strong>Can be changed:</strong> T</td>
</tr>
<tr>
<td><strong>Data type:</strong> Unsigned32 / Binary</td>
</tr>
<tr>
<td><strong>P-Group:</strong> Basic positioner</td>
</tr>
<tr>
<td><strong>Not for motor type:</strong> -</td>
</tr>
<tr>
<td><strong>Min</strong></td>
</tr>
<tr>
<td>-</td>
</tr>
</tbody>
</table>

**Description:**
Sets the signal source to enable the basic positioner.
- BI: p2656 = 1 signal
- The basic positioner is enabled.
- BI: p2656 = 0 signal
- The basic positioner is not enabled.

**Dependency:**
Refer to: r2526, p2655

### p2657

<table>
<thead>
<tr>
<th><strong>CI: EPOS position actual value/position setting value / Pos act/set value</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SERVO_S110-CAN (EPOS), SERVO_S110-DP (EPOS), SERVO_S110-PN (EPOS)</strong></td>
</tr>
<tr>
<td><strong>Can be changed:</strong> T</td>
</tr>
<tr>
<td><strong>Data type:</strong> Unsigned32 / Integer32</td>
</tr>
<tr>
<td><strong>P-Group:</strong> Basic positioner</td>
</tr>
<tr>
<td><strong>Not for motor type:</strong> -</td>
</tr>
<tr>
<td><strong>Min</strong></td>
</tr>
<tr>
<td>-</td>
</tr>
</tbody>
</table>

**Description:**
Sets the signal source for the position actual value/position setting value.

**Dependency:**
Refer to: r2521, p2658

**Note:**
In the tracking mode, the position setpoint is taken from this connector input.
### p2658

**BI: EPOS pos. actual value valid, feedback signal / Pos valid feedback**

<table>
<thead>
<tr>
<th>Description</th>
<th>Access level</th>
<th>Func. diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sets the signal source for the feedback signal &quot;position actual value is valid&quot;.</td>
<td>3</td>
<td>3635</td>
</tr>
<tr>
<td>BI: p2658 = 1 signal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The position actual value received via CI: p2657 is valid.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BI: p2658 = 0 signal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The position actual value received via CI: p2657 is invalid.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Note:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>While a 0 signal is present, the position setpoint (p2665) is held at the value of 0.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Dependencies

- Refer to: r2526, p2657

#### Data type:
- Unsigned32 / Binary

#### P-Group:
- Basic positioner

#### Not for motor type:
- 

#### Access level:
- 3

#### Expert list:
- 1

#### Factory setting:
- 2526.0

- **Min** | **Max**
- - | -

### p2659

**BI: EPOS referencing active feedback signal / Ref act fdbk**

<table>
<thead>
<tr>
<th>Description</th>
<th>Access level</th>
<th>Func. diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sets the signal source for the feedback signal &quot;referencing active&quot;.</td>
<td>3</td>
<td>3612</td>
</tr>
<tr>
<td>BI: p2659 = 1 signal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Referencing is active.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BI: p2659 = 0 signal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Referencing is not active.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Note:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Refer to: r2526</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Dependencies

- Refer to: r2526

#### Data type:
- Unsigned32 / Binary

#### P-Group:
- Basic positioner

#### Not for motor type:
- 

#### Access level:
- 3

#### Expert list:
- 1

#### Factory setting:
- 2526.1

- **Min** | **Max**
- - | -

### p2660

**CI: EPOS measured value referencing / Meas val ref**

<table>
<thead>
<tr>
<th>Description</th>
<th>Access level</th>
<th>Func. diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sets the signal source for the measured value for the function &quot;referencing&quot;.</td>
<td>3</td>
<td>3612, 3614</td>
</tr>
<tr>
<td>Note:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Refer to: r2523</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Dependencies

- Refer to: r2523

#### Data type:
- Unsigned32 / Integer32

#### P-Group:
- Basic positioner

#### Not for motor type:
- 

#### Access level:
- 3

#### Expert list:
- 1

#### Factory setting:
- 2523[0]

- **Min** | **Max**
- - | -

### p2661

**BI: EPOS measured value valid, feedback signal / MeasVal valid fdbk**

<table>
<thead>
<tr>
<th>Description</th>
<th>Access level</th>
<th>Func. diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sets the signal source for the feedback signal &quot;measured value valid&quot;.</td>
<td>3</td>
<td>3612, 3614, 3615</td>
</tr>
<tr>
<td>Note:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Refer to: r2523</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Dependencies

- Refer to: r2523

#### Data type:
- Unsigned32 / Binary

#### P-Group:
- Basic positioner

#### Not for motor type:
- 

#### Access level:
- 3

#### Expert list:
- 1

#### Factory setting:
- 2526.2

- **Min** | **Max**
- - | -
Parameter

List of parameters

BI: p2661 = 1 signal
The measured value received via CI: p2660 is valid.
BI: p2661 = 0 signal
The measured value received via CI: p2660 is invalid.

Dependency:
Refer to: r2526, p2660

p2662  BI: EPOS adjustment value valid feedback signal / Adj val valid FS
SERVO_S110-CAN (EPOS),
SERVO_S110-DP (EPOS),
SERVO_S110-PN (EPOS)
Can be changed: T
Data type: Unsigned32 / Binary
P-Group: Basic positioner
Not for motor type: -
Min
Max
Factory setting
Description:
Sets the signal source for the feedback signal "adjustment value valid".

BI: p2662 = 1 signal
The adjustment value received via CI: p2660 is valid.
BI: p2662 = 0 signal
The adjustment value received via CI: p2660 is not valid.

Dependency:
Refer to: r2526, p2660

p2663  BI: EPOS clamping active feedback signal / Clamping active FS
SERVO_S110-CAN (EPOS),
SERVO_S110-DP (EPOS),
SERVO_S110-PN (EPOS)
Can be changed: T
Data type: Unsigned32 / Binary
P-Group: Basic positioner
Not for motor type: -
Min
Max
Factory setting
Description:
Sets the signal source for the feedback signal "clamping active for travel to fixed stop".

BI: p2663 = 1 signal
Clamping is active
BI: p2663 = 0 signal
Clamping is not active.

Dependency:
Refer to: r2526

Note:
The feedback signal from "terminals active" is, for the factory setting, dependent on the signal BO: r2526.8 (terminals active when moving to a fixed stop).

r2665  CO: EPOS position setpoint / s_set
SERVO_S110-CAN (EPOS),
SERVO_S110-DP (EPOS),
SERVO_S110-PN (EPOS)
Can be changed: -
Data type: Integer32
P-Group: Basic positioner
Not for motor type: -
Min
Max
Factory setting
Description:
Displays the current absolute position setpoint.

Dependency:
Refer to: p2530

Note:
As standard, the following BICO interconnection is established: CI: p2530 = r2665

Note: The feedback signal from "terminals active" is, for the factory setting, dependent on the signal BO: r2526.8 (terminals active when moving to a fixed stop).
### List of parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
</table>
| r2666     | CO: EPOS velocity setpoint / v_set | Displays the current velocity setpoint. | Refer to: p2531  
As standard, the following BICO interconnection is established: Cl: p2531 = r2666 |
| r2667     | CO: EPOS backlash compensation value / Backlash value | Displays the currently effective value for backlash compensation. | Refer to: p2516  
As standard, the following BICO interconnection is established: Cl: p2516 = r2667 |
| r2669     | CO: EPOS current operating mode / Op mode act | Displays the current active operating mode. | Refer to: p2589, p2590, p2595, p2631, p2647, p2653 |
| r2670.0...15 | CO/BO: EPOS status word, active traversing block / ZSW act trav_block | Displays the status word for the active traversing block. |
r2670.0: Active traversing block, bit 0
...

r2670.5: Active traversing block, bit 5
r2670.15: MDI active

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Active traversing block, bit 0</td>
<td>Active</td>
<td>Not active</td>
<td>-</td>
</tr>
<tr>
<td>01</td>
<td>Active traversing block, bit 1</td>
<td>Active</td>
<td>Not active</td>
<td>-</td>
</tr>
<tr>
<td>02</td>
<td>Active traversing block, bit 2</td>
<td>Active</td>
<td>Not active</td>
<td>-</td>
</tr>
<tr>
<td>03</td>
<td>Active traversing block, bit 3</td>
<td>Active</td>
<td>Not active</td>
<td>-</td>
</tr>
<tr>
<td>04</td>
<td>Active traversing block, bit 4</td>
<td>Active</td>
<td>Not active</td>
<td>-</td>
</tr>
<tr>
<td>05</td>
<td>Active traversing block, bit 5</td>
<td>Active</td>
<td>Not active</td>
<td>-</td>
</tr>
<tr>
<td>15</td>
<td>MDI active</td>
<td>Active</td>
<td>Not active</td>
<td>-</td>
</tr>
</tbody>
</table>

Dependency: Refer to: p2631, p2647

Note: Re bit 00 ... 05:
Displays the active traversing block in the traversing blocks operating mode.
Re bit 15:
For a 1 signal, the operating mode - direct setpoint input/MDI - is active

r2671 CO: EPOS current position setpoint / s_set act

<table>
<thead>
<tr>
<th>SERVO_S110-CAN (EPOS)</th>
<th>SERVO_S110-DP (EPOS)</th>
<th>SERVO_S110-PN (EPOS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed: -</td>
<td>Calculated: -</td>
<td>Access level: 1</td>
</tr>
<tr>
<td>Data type: Integer32</td>
<td>Dynamic index: -</td>
<td>Func. diagram: 3610, 3616, 3620</td>
</tr>
<tr>
<td>P-Group: Basic positioner</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
</tr>
<tr>
<td>- [LU]</td>
<td>- [LU]</td>
<td>- [LU]</td>
</tr>
</tbody>
</table>

Description: Displays the position setpoint presently being processed.

Note: A position of 0 is displayed for non position-related tasks (e.g. ENDLESS_POS, ENDLESS_NEG).

r2672 CO: EPOS current velocity setpoint / v_set act

<table>
<thead>
<tr>
<th>SERVO_S110-CAN (EPOS)</th>
<th>SERVO_S110-DP (EPOS)</th>
<th>SERVO_S110-PN (EPOS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed: -</td>
<td>Calculated: -</td>
<td>Access level: 1</td>
</tr>
<tr>
<td>Data type: Integer32</td>
<td>Dynamic index: -</td>
<td>Func. diagram: 3610, 3612, 3616, 3620</td>
</tr>
<tr>
<td>P-Group: Basic positioner</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
</tr>
<tr>
<td>- [1000 LU/min]</td>
<td>- [1000 LU/min]</td>
<td>- [1000 LU/min]</td>
</tr>
</tbody>
</table>

Description: Displays the velocity setpoint presently being processed.

r2673 CO: EPOS current acceleration override / a_over act

<table>
<thead>
<tr>
<th>SERVO_S110-CAN (EPOS)</th>
<th>SERVO_S110-DP (EPOS)</th>
<th>SERVO_S110-PN (EPOS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed: -</td>
<td>Calculated: -</td>
<td>Access level: 1</td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td>Dynamic index: -</td>
<td>Func. diagram: 3610, 3612, 3616, 3620</td>
</tr>
<tr>
<td>P-Group: Basic positioner</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
</tr>
<tr>
<td>- [%]</td>
<td>- [%]</td>
<td>- [%]</td>
</tr>
</tbody>
</table>

Description: Displays the acceleration override presently being processed.

Note: An override of 100% is effective in the "jogging" and "search for reference" operating modes.
**r2674**  
**CO: EPOS current deceleration override / -a_over act**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN (EPOS), SERVO_S110-DP (EPOS), SERVO_S110-PN (EPOS)</td>
<td>Displays the deceleration override presently being processed.</td>
<td>An override of 100% is effective in the “jogging” and “search for reference” operating modes.</td>
</tr>
</tbody>
</table>

Can be changed: -  
Data type: FloatingPoint32  
P-Group: Basic positioner  
Not for motor type: -  
Min - [%]  
Max - [%]  
Access level: 1  
Dependency: Refer to: p2621

**r2675**  
**CO: EPOS current task / Task cur**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
</table>
| SERVO_S110-CAN (EPOS), SERVO_S110-DP (EPOS), SERVO_S110-PN (EPOS) | Displays the task that is presently being processed. | 0: Inactive  
1: POSITIONING  
2: FIXED STOP  
3: ENDLESS_POS  
4: ENDLESS_NEG  
5: WAITING  
6: GOTO  
7: SET_O  
8: RESET_O  
9: JERK |

Can be changed: -  
Data type: Integer16  
P-Group: Basic positioner  
Not for motor type: -  
Min 0  
Max 9  
Access level: 1  
Dependency: Refer to: p2621

**r2676**  
**CO: EPOS current task parameter / Task para cur**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN (EPOS), SERVO_S110-DP (EPOS), SERVO_S110-PN (EPOS)</td>
<td>Displays the task parameter presently being processed in the “traversing blocks” operating mode.</td>
<td>Refer to: p2622</td>
</tr>
</tbody>
</table>

Can be changed: -  
Data type: Integer32  
P-Group: Basic positioner  
Not for motor type: -  
Min -  
Max -  
Access level: 1  
Dependency: Refer to: p2622

Note: The following is displayed depending on the task:  
FIXED STOP: Clamping torque (0 ... 65536 [0.01 Nm]) or clamping force (0 ... 65536 [N])  
WAIT: Delay time [ms]  
GOTO: Block number  
SET_O: 1, 2, 3 → direct output 1, 2 or 3 (both) is set  
RESET_O: 1, 2, 3 → direct output 1, 2 or 3 (both) is set  
JERK: 0 → de-activate, 1 → activate
**r2677**

**CO: EPOS current task mode / Task mode cur**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN (EPOS), SERVO_S110-DP (EPOS), SERVO_S110-PN (EPOS)</td>
<td>Displays the task mode presently being processed.</td>
<td>p2623</td>
<td></td>
</tr>
</tbody>
</table>

**r2678**

**CO: EPOS external block change / Ext BlckChg s_act**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN (EPOS), SERVO_S110-DP (EPOS), SERVO_S110-PN (EPOS)</td>
<td>Displays the actual position for the following events: - external block change via measuring probe (p2632 = 0, Bi: p2661 = 0/1 signal). - external block change via Bi: p2633 (p2632 = 1, Bi: p2633 = 0/1 signal). - activate traversing task (Bi: p2631 = 0/1 signal).</td>
<td>p2633, p2661, p2631</td>
<td></td>
</tr>
</tbody>
</table>

**r2680**

**CO: EPOS clearance, reference cam and zero mark / Clearance cam/ZM**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN (EPOS), SERVO_S110-DP (EPOS), SERVO_S110-PN (EPOS)</td>
<td>Displays the clearance determined between the reference cam and zero mark in the search for reference.</td>
<td>p2632, p2633, p2661</td>
<td></td>
</tr>
</tbody>
</table>

**r2681**

**CO: EPOS velocity override effective / v_over effective**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN (EPOS), SERVO_S110-DP (EPOS), SERVO_S110-PN (EPOS)</td>
<td>Displays the currently effective velocity override.</td>
<td>p2571, p2646</td>
<td></td>
</tr>
</tbody>
</table>

**Note:**
The effective override can differ from the specified override due to limits (e.g. p2571, maximum velocity).
### List of parameters

#### r2682

**CO: EPOS residual distance to go / Residual distance**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Data type</th>
<th>Dynamic index</th>
<th>P-Group</th>
<th>Units group</th>
<th>Expert list</th>
</tr>
</thead>
<tbody>
<tr>
<td>r2682</td>
<td>Displays the current residual distance. The remaining distance is the distance to still to be moved through up to the end of the current positioning task.</td>
<td>Integer32</td>
<td>-</td>
<td>Basic positioner</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>

**Dependency:**
- Refer to: r2665, r2671, r2678

**Note:**
Re bit 02, 04, 05, 06, 07:
This signals designate the state after jerk limiting.
Re bit 08, 09:
These signals are generated in the "closed-loop position control" function module.

#### r2683.0...14

**CO/BO: EPOS status word 1 / POS_ZSW1**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Data type</th>
<th>Dynamic index</th>
<th>P-Group</th>
<th>Units group</th>
<th>Expert list</th>
</tr>
</thead>
<tbody>
<tr>
<td>r2683.0...14</td>
<td>Displays status word 1 for the basic positioner (EPOS).</td>
<td>Unsigned16</td>
<td>-</td>
<td>Closed loop position control</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>

**Dependency:**
- Refer to: r2684
### r2684.0...15

**Parameter**

**List of parameters**

<table>
<thead>
<tr>
<th>CO/BO: EPOS status word 2 / POS_ZSW2</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN (Pos ctrl), SERVO_S110-DP (Pos ctrl), SERVO_S110-PN (Pos ctrl)</td>
</tr>
<tr>
<td>Can be changed: -</td>
</tr>
<tr>
<td>Calculated: -</td>
</tr>
<tr>
<td>Access level: 1</td>
</tr>
<tr>
<td>Data type: Unsigned16</td>
</tr>
<tr>
<td>Dynamic index: -</td>
</tr>
<tr>
<td>Func. diagram: 3646</td>
</tr>
<tr>
<td>P-Group: Closed loop position control</td>
</tr>
<tr>
<td>Units group: -</td>
</tr>
<tr>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
</tr>
<tr>
<td>Scaling: -</td>
</tr>
<tr>
<td>Expert list: 1</td>
</tr>
</tbody>
</table>

**Description:**
Displays status word 2 for the basic positioner (EPOS).

**Note:**
- **Re bit 02:** The "referencing active" signal is an OR logic operation of "search for reference active" and "flying referencing active".
- **Re bit 00 ... 07 and 11 ... 14:** These signals are generated in the function module "basic positioner".
- **Re bit 08:** The signal is generated in the "closed-loop position control" function module.

#### Bit field:

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Search for reference active</td>
<td>Active</td>
<td>Not active</td>
<td>3612</td>
</tr>
<tr>
<td>01</td>
<td>Flying referencing active</td>
<td>Active</td>
<td>Not active</td>
<td>3614</td>
</tr>
<tr>
<td>02</td>
<td>Referencing active</td>
<td>Active</td>
<td>Not active</td>
<td>-</td>
</tr>
<tr>
<td>03</td>
<td>Printing mark outside outer window</td>
<td>Yes</td>
<td>No</td>
<td>3614</td>
</tr>
<tr>
<td>04</td>
<td>Axis accelerating</td>
<td>Yes</td>
<td>No</td>
<td>3635</td>
</tr>
<tr>
<td>05</td>
<td>Axis decelerating</td>
<td>Yes</td>
<td>No</td>
<td>3635</td>
</tr>
<tr>
<td>06</td>
<td>Jerk limiting active</td>
<td>Yes</td>
<td>No</td>
<td>3635</td>
</tr>
<tr>
<td>07</td>
<td>Activate correction</td>
<td>Yes</td>
<td>No</td>
<td>3635</td>
</tr>
<tr>
<td>08</td>
<td>Following error in tolerance</td>
<td>Yes</td>
<td>No</td>
<td>4025</td>
</tr>
<tr>
<td>09</td>
<td>Modulo correction active</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>10</td>
<td>Target position reached</td>
<td>Yes</td>
<td>No</td>
<td>4020</td>
</tr>
<tr>
<td>11</td>
<td>Reference point set</td>
<td>Yes</td>
<td>No</td>
<td>3612, 3614, 3616, 3620, 3630, 3635</td>
</tr>
<tr>
<td>12</td>
<td>Acknowledgement, traversing block activated</td>
<td>Yes</td>
<td>No</td>
<td>3620</td>
</tr>
<tr>
<td>13</td>
<td>STOP cam minus active</td>
<td>Yes</td>
<td>No</td>
<td>3630</td>
</tr>
<tr>
<td>14</td>
<td>STOP cam plus active</td>
<td>Yes</td>
<td>No</td>
<td>3630</td>
</tr>
<tr>
<td>15</td>
<td>Traversing command active</td>
<td>Yes</td>
<td>No</td>
<td>3635</td>
</tr>
</tbody>
</table>

**Note:**
- **Re bit 02:** The "referencing active" signal is an OR logic operation of "search for reference active" and "flying referencing active".
- **Re bit 00 ... 07 and 11 ... 14:** These signals are generated in the function module "basic positioner".
- **Re bit 08:** The signal is generated in the "closed-loop position control" function module.

### r2685

**Parameter**

**List of parameters**

<table>
<thead>
<tr>
<th>CO: EPOS corrective value / Corrective value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN (EPOS), SERVO_S110-DP (EPOS), SERVO_S110-PN (EPOS)</td>
</tr>
<tr>
<td>Can be changed: -</td>
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<td>Calculated: -</td>
</tr>
<tr>
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<tr>
<td>Data type: Integer32</td>
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<tr>
<td>Dynamic index: -</td>
</tr>
<tr>
<td>Func. diagram: 3635</td>
</tr>
<tr>
<td>P-Group: Basic positioner</td>
</tr>
<tr>
<td>Units group: -</td>
</tr>
<tr>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
</tr>
<tr>
<td>Scaling: -</td>
</tr>
<tr>
<td>Expert list: 1</td>
</tr>
</tbody>
</table>

**Description:**
Displays the corrective value for the position actual value.

**Dependency:**
Refer to: r2684

**Note:**
As standard, the following BICO interconnection is established: CI: p2513 = r2685
Using this value, e.g. modulo corrections are carried out.
<table>
<thead>
<tr>
<th>Parameter Name</th>
<th>Description</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Dynamic index:</th>
<th>Units group:</th>
<th>Expert list:</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>r2686[0...1]</td>
<td>CO: EPOS torque limiting effective / M_limit eff</td>
<td>Displays the effective torque limiting. r2686[0]: Displays the effective upper torque limiting when traversing to fixed stop (referred to CI: p1522, CI: p1523). r2686[1]: Displays the effective lower torque limiting when traversing to fixed stop (referred to CI: p1522, CI: p1523).</td>
<td>- [%]</td>
<td>- [%]</td>
<td>- [%]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>r2687</td>
<td>CO: EPOS torque setpoint / M_set</td>
<td>Displays the effective torque setpoint when reaching the fixed stop (referred to CI: p1522, CI: p1523).</td>
<td>- [Nm]</td>
<td>- [Nm]</td>
<td>- [Nm]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>p2690</td>
<td>CO: EPOS position fixed setpoint / Pos fixed value</td>
<td>Sets a fixed setpoint for the position.</td>
<td>2147482648 [LU]</td>
<td>2147482647 [LU]</td>
<td>0 [LU]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>p2691</td>
<td>CO: EPOS velocity fixed setpoint / v fixed value</td>
<td>Sets a fixed setpoint for the velocity.</td>
<td>1 [1000 LU/min]</td>
<td>40000000 [1000 LU/min]</td>
<td>600 [1000 LU/min]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Parameter
List of parameters

**p2692**
CO: EPOS acceleration override, fixed setpoint / a_over fixed val

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p2692</td>
<td>Can be changed: U, T</td>
<td>0.100 [%]</td>
<td>100.000 [%]</td>
<td>100.000 [%]</td>
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<tr>
<td>SERVO_S110-CAN (EPOS), SERVO_S110-DP (EPOS), SERVO_S110-PN (EPOS)</td>
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<tr>
<td>P-Group: Basic positioner</td>
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</tr>
<tr>
<td>Not for motor type: -</td>
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<tr>
<td>Data type: FloatingPoint32</td>
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<tr>
<td>P-Group: Basic positioner</td>
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<tr>
<td>Not for motor type: -</td>
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<td></td>
</tr>
<tr>
<td>Calculated: -</td>
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<tr>
<td>Dynamic index: -</td>
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<tr>
<td>Units group: -</td>
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<tr>
<td>Unit selection: -</td>
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<tr>
<td>Scaling: -</td>
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<td>Expert list: 1</td>
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</tbody>
</table>

Dependency:
Refer to: p2572, p2644

Note:
As standard, the following BICO interconnection is established: CI: p2644 = r2692
The percentage value refers to the maximum acceleration (p2572).

**p2693**
CO: EPOS deceleration override, fixed setpoint / -a_over fixed val

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p2693</td>
<td>Can be changed: U, T</td>
<td>0.100 [%]</td>
<td>100.000 [%]</td>
<td>100.000 [%]</td>
</tr>
<tr>
<td>SERVO_S110-CAN (EPOS), SERVO_S110-DP (EPOS), SERVO_S110-PN (EPOS)</td>
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<tr>
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<tr>
<td>P-Group: Basic positioner</td>
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<tr>
<td>Not for motor type: -</td>
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<td></td>
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<td>Calculated: -</td>
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<tr>
<td>Units group: -</td>
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<td>Unit selection: -</td>
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<tr>
<td>Scaling: -</td>
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<tr>
<td>Expert list: 1</td>
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</table>

Dependency:
Refer to: p2573, p2645

Note:
As standard, the following BICO interconnection is established: CI: p2645 = r2693
The percentage value refers to the maximum deceleration (p2573).

**r2700**
CO: Reference speed/reference frequency / n_ref/f_ref

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
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<tbody>
<tr>
<td>r2700</td>
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<tr>
<td>P-Group: -</td>
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</tr>
<tr>
<td>Not for motor type: -</td>
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<td></td>
<td></td>
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<tr>
<td>Calculated: -</td>
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<tr>
<td>Dynamic index: -</td>
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<tr>
<td>Units group: -</td>
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<tr>
<td>Unit selection: -</td>
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<td>Scaling: -</td>
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<tr>
<td>Expert list: 1</td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>

Dependency:
Refer to: p2000

Note:
This parameter provides the numerical value of the reference quantity p2000 as a connector output for interconnection with Drive Control Chart (DCC). The numerical value can be adopted unchanged from this connector output in DCC.

**r2701**
CO: Reference voltage / Reference voltage

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
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<td>r2701</td>
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<td>-</td>
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</tr>
<tr>
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<tr>
<td>P-Group: -</td>
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<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calculated: -</td>
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<tr>
<td>Dynamic index: -</td>
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<td>Units group: -</td>
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<tr>
<td>Scaling: -</td>
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<tr>
<td>Expert list: 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Dependency:
Refer to: p2001

Note:
All voltages specified as relative value are referred to this reference quantity. The reference quantity in this parameter corresponds to 100% or 4000 hex or 4000 0000 hex.

This parameter has the unit Vrms.

Dependency:
Refer to: p2001

Note:
This parameter provides the numerical value of the reference quantity p2001 as a connector output for interconnection with Drive Control Chart (DCC). The numerical value can be adopted unchanged from this connector output in DCC.

r2702  
**CO: Reference current / Reference current**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed:</td>
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<tr>
<td>Func. diagram:</td>
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</tr>
<tr>
<td>P-Group:</td>
<td>-</td>
</tr>
<tr>
<td>Units group:</td>
<td>-</td>
</tr>
<tr>
<td>Unit selection:</td>
<td>-</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
</tr>
<tr>
<td>Scaling:</td>
<td>-</td>
</tr>
<tr>
<td>Expert list:</td>
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</tr>
<tr>
<td>Min</td>
<td>-</td>
</tr>
<tr>
<td>Max</td>
<td>-</td>
</tr>
<tr>
<td>Factory setting</td>
<td>-</td>
</tr>
</tbody>
</table>

**Description:**
Connector output of the reference quantity for currents p2002. All currents specified as relative value are referred to this reference quantity. The reference quantity in this parameter corresponds to 100% or 4000 hex or 4000 0000 hex.

This parameter has the unit Arms.

Dependency:
Refer to: p2002

Note:
This parameter provides the numerical value of the reference quantity p2002 as a connector output for interconnection with Drive Control Chart (DCC). The numerical value can be adopted unchanged from this connector output in DCC.

r2703  
**CO: Reference torque / Reference torque**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed:</td>
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<tr>
<td>Func. diagram:</td>
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<tr>
<td>P-Group:</td>
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<tr>
<td>Units group:</td>
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<tr>
<td>Unit selection:</td>
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<tr>
<td>Not for motor type:</td>
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<tr>
<td>Scaling:</td>
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<td>Expert list:</td>
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<tr>
<td>Min</td>
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<tr>
<td>Max</td>
<td>-</td>
</tr>
<tr>
<td>Factory setting</td>
<td>-</td>
</tr>
</tbody>
</table>

**Description:**
Connector output of the reference quantity p2003 for torque (r0108.12 = 0) or force (r0108.12 = 1). All torques specified as relative value (r0108.12 = 0) or forces (r0108.12 = 1) are referred to this reference quantity. The reference quantity in this parameter corresponds to 100% or 4000 hex or 4000 0000 hex. The unit of this parameter is the same as the unit selected for p2003.

Dependency:
p0505, r0108.12
Refer to: p2003

Note:
This parameter provides the numerical value of the reference quantity p2003 in the currently selected unit as a connector output for interconnection with Drive Control Chart (DCC). The numerical value can be adopted unchanged from this connector output in DCC.

r2704  
**CO: Reference power / Reference power**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed:</td>
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<tr>
<td>Calculated:</td>
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<td>Access level:</td>
<td>3</td>
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<td>FloatingPoint32</td>
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<td>Dynamic index:</td>
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<tr>
<td>Func. diagram:</td>
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<tr>
<td>P-Group:</td>
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<td>Units group:</td>
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</tr>
<tr>
<td>Unit selection:</td>
<td>-</td>
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<tr>
<td>Not for motor type:</td>
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</tr>
<tr>
<td>Scaling:</td>
<td>-</td>
</tr>
<tr>
<td>Expert list:</td>
<td>1</td>
</tr>
<tr>
<td>Min</td>
<td>-</td>
</tr>
<tr>
<td>Max</td>
<td>-</td>
</tr>
<tr>
<td>Factory setting</td>
<td>-</td>
</tr>
</tbody>
</table>

**Description:**
Connector output of the reference quantity for powers p2004. All power ratings specified as relative value are referred to this reference quantity. The reference quantity in this parameter corresponds to 100% or 4000 hex or 4000 0000 hex. The unit of this parameter is the same as the unit selected for p2004.

Dependency:
This value is calculated as voltage x current for the infeed and as torque x speed for closed-loop controls.
Refer to: r2004
Note: This parameter provides the numerical value of the reference quantity p2004 in the currently selected unit as a connector output for interconnection with Drive Control Chart (DCC). The numerical value can be adopted unchanged from this connector output in DCC. The reference power is calculated as follows:
- \(2 \pi \times \text{reference speed} / 60 \times \text{reference torque} \) (motor)
- \(\text{reference voltage} \times \text{reference current} \times \sqrt{3} \) (infeed)

### r2705 CO: Reference angle / Reference angle

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Access level: 3</th>
</tr>
</thead>
<tbody>
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<td>SERVO_S110-DP</td>
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<tr>
<td>SERVO_S110-PN</td>
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<td>Data type:</td>
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<tr>
<td>FloatingPoint32</td>
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<tr>
<td>P-Group:</td>
<td>Unit selection: -</td>
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</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
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<tr>
<td>Min</td>
<td>Factory setting</td>
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</tr>
<tr>
<td>Max</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

#### Description:
Connector output of the reference quantity for angles p2005.
All angles specified as relative value are referred to this reference quantity. The reference quantity in this parameter corresponds to 100% or 4000 hex or 4000 0000 hex.
This parameter has the unit degree.

#### Dependency:
Refer to: p2005

#### Note:
This parameter provides the numerical value of the reference quantity p2005 as a connector output for interconnection with Drive Control Chart (DCC). The numerical value can be adopted unchanged from this connector output in DCC.

### r2706 CO: Reference temp / Reference temp

<table>
<thead>
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<th>Description</th>
<th>Access level: 3</th>
</tr>
</thead>
<tbody>
<tr>
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<td>SERVO_S110-DP</td>
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<tr>
<td>SERVO_S110-PN</td>
<td>Access level: 3</td>
<td></td>
</tr>
<tr>
<td>Data type:</td>
<td>Dynamic index: -</td>
<td></td>
</tr>
<tr>
<td>FloatingPoint32</td>
<td>Units group: -</td>
<td></td>
</tr>
<tr>
<td>P-Group:</td>
<td>Unit selection: -</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td>Max</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

#### Description:
Connector output of the reference quantity for temperatures.
All temperatures specified as relative value are referred to this reference quantity. The reference quantity in this parameter corresponds to 100% or 4000 hex or 4000 0000 hex.
This parameter has the unit degree Celsius.

#### Note:
This parameter provides the numerical value of the reference quantity for the temperature as a connector output for interconnection with Drive Control Chart (DCC). The numerical value can be adopted unchanged from this connector output in DCC.

### r2707 CO: Reference acceleration / Ref accel

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Access level: 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN</td>
<td>Can be changed: -</td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-DP</td>
<td>Calculated: -</td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-PN</td>
<td>Access level: 3</td>
<td></td>
</tr>
<tr>
<td>Data type:</td>
<td>Dynamic index: -</td>
<td></td>
</tr>
<tr>
<td>FloatingPoint32</td>
<td>Units group: -</td>
<td></td>
</tr>
<tr>
<td>P-Group:</td>
<td>Unit selection: -</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td>Max</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

#### Description:
All acceleration rates specified as relative value are referred to this reference quantity. The reference quantity in this parameter corresponds to 100% or 4000 hex or 4000 0000 hex.
The unit of this parameter is the same as the unit selected for p2007.

#### Dependency:
Refer to: p2007

#### Note:
This parameter provides the numerical value of the reference quantity p2007 as a connector output for interconnection with Drive Control Chart (DCC). The numerical value in the currently selected unit can be adopted unchanged from this connector output in DCC.
### List of parameters

**p2720[0...n]**  
**Load gear configuration / Load gear config**

- **SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**
- Can be changed: C2(1, 4)
- Data type: Unsigned32
- P-Group: Encoder
- Not for motor type: -
- Min: -
- Calculated: -
- Dynamic index: DDS, p0180
- Units group: -
- Scaling: -
- Factory setting: 00000 bin
- Access level: 1
- Func. diagram: -
- Unit selection: -
- Expert list: 1

**Description:**
Sets the configuration for position tracking of a load gear.

**Bit field:**

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Load gear, activate position tracking</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>01</td>
<td>Axis type</td>
<td>Linear axis</td>
<td>Rotary axis</td>
<td>-</td>
</tr>
<tr>
<td>02</td>
<td>Load gear, reset position</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
</tbody>
</table>

**Note:**
- For the following events, the non-volatile, saved position values are automatically reset:
  - when an encoder replacement has been identified.
  - when changing the configuration of the Encoder Data Set (EDS).
  - when adjusting the absolute encoder again.

---

**p2721[0...n]**  
**Load gear, rotary absolute gearbox, revolutions, virtual / Abs rot rev**

- **SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**
- Can be changed: C2(1, 4)
- Data type: Unsigned32
- P-Group: Encoder
- Not for motor type: -
- Min: -
- Calculated: -
- Dynamic index: DDS, p0180
- Units group: -
- Scaling: -
- Factory setting: 00000 bin
- Access level: 1
- Func. diagram: -
- Unit selection: -
- Expert list: 1

**Description:**
Sets the number of rotations that can be resolved for a rotary absolute encoder with activated position tracking of the load gear.

**Dependency:**
This parameter is only of significance for an absolute encoder (p0404.1 = 1) with activated position tracking of the load gear (p2720.0 = 1).

**Note:**
- The resolution that is set must be able to be represented using r2723.
- For rotary axes/modulo axes, the following applies:
  - This parameter is pre-set with p0421 and can be changed.
- For linear axes, the following applies:
  - This parameter is pre-assigned with p0421, expanded by 6 bits for multiturn information (maximum number of overflows) and cannot be changed.

---

**p2722[0...n]**  
**Load gear, position tracking tolerance window / Pos track tol**

- **SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**
- Can be changed: C2(1, 4)
- Data type: FloatingPoint32
- P-Group: Encoder
- Not for motor type: -
- Min: -
- Calculated: -
- Dynamic index: DDS, p0180
- Units group: -
- Scaling: -
- Factory setting: 00000 bin
- Access level: 3
- Func. diagram: -
- Unit selection: -
- Expert list: 1

**Description:**
Sets a tolerance window for position tracking.

After the system is powered up, the difference between the saved position and the actual position is determined, and depending on this, the following is initiated:

Difference within the tolerance window --> The position is reproduced as a result of the encoder actual value.
Difference outside the tolerance window --> An appropriate message is output.

**Dependency:**
Refer to: F07449

**Caution:**
Rotation, e.g. through a complete encoder range is not detected.
**Note:**

The value is entered in integer (complete) encoder pulses.

For p2720.0 = 1, the value is automatically pre-assigned quarter of the encoder range.

Example:

Quarter of the encoder range = (p0408 * p0421) / 4

It is possible that the tolerance window may not be able to be precisely set due to the data type (floating point number with 23 bit mantissa).

---

**r2723[0...n]**

**CO: Load gear absolute value / Load gear abs_val**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Can be changed: -</td>
<td>Calculated: -</td>
<td>Access level: 1</td>
</tr>
<tr>
<td>Data type: Unsigned32</td>
<td>Dynamic index: DDS, p0180</td>
<td>Unit selection: -</td>
<td>Func. diagram: 4010, 4704</td>
</tr>
<tr>
<td>P-Group: Encoder</td>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
</tr>
</tbody>
</table>

**Description:**
Displays the absolute value after the load gear.

**Notice:**
The encoder position actual value must be requested using the encoder control word Gn_STW.13.

**Note:**
The increments are displayed in the format the same as r0483.

---

**r2724[0...n]**

**CO: Load gear position difference / Load gear pos diff**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Can be changed: -</td>
<td>Calculated: -</td>
<td>Access level: 1</td>
</tr>
<tr>
<td>Data type: Integer32</td>
<td>Dynamic index: DDS, p0180</td>
<td>Unit selection: -</td>
<td>Func. diagram: -</td>
</tr>
<tr>
<td>P-Group: Encoder</td>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
</tr>
</tbody>
</table>

**Description:**
Displays the position difference before the load gear between powering down and powering up.

**Note:**
The increments are displayed in the same format as for r0483/r2723.

If the measuring gear of the motor encoder is not activated, the position difference should be read in encoder increments.

If the measuring gear of the motor encoder is activated, the position difference is converted using the measuring gear factor.

---

**p2730[0...3]**

**BI: LR pos. actual value preprocessing activate neg. corr. (edge) / ActV_prep neg corr**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN (Pos ctrl), SERVO_S110-DP (Pos ctrl), SERVO_S110-PN (Pos ctrl)</td>
<td>Can be changed: T</td>
<td>Calculated: -</td>
<td>Access level: 1</td>
</tr>
<tr>
<td>Data type: Unsigned32 / Binary</td>
<td>Dynamic index: -</td>
<td>Units group: -</td>
<td>Func. diagram: 4010, 4015</td>
</tr>
<tr>
<td>P-Group: Closed loop position control</td>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
</tr>
</tbody>
</table>

**Description:**
Sets the signal source for the function "activate position actual value preprocessing, negative corrective value (edge)".

0/1 signal:
The correction value available via CI: p2513 is negated and activated.

**Index:**

0 = Closed-loop position control
1 = Encoder 1
2 = Encoder 2
3 = Reserved

**Dependency:**
Refer to: p2502, p2513, r2684

**Note:**
When the pulse/direction interface is activated in position control (p0184 > 0 and p0400 = 9000) the following BICO interconnections are established:

BI:p2730[0] = r0722.2 and BI: p2730[p0184] = r0722.2
### p2810[0...1] BI: AND logic operation inputs / AND inputs

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

- **Can be changed:** T
- **Calculated:** -
- **Access level:** 2
- **Data type:** Unsigned32 / Binary
- **Dynamic index:** -
- **Func. diagram:** 2634
- **P-Group:** Functions
- **Units group:** -
- **Unit selection:** -
- **Not for motor type:** -
- **Scaling:** -
- **Expert list:** 1
- **Min:** -
- **Max:** -
- **Factory setting:** 0

**Description:** Sets the signal sources for the inputs of the AND logic operation.

**Dependency:** Refer to: r2811

**Note:**

- [0]: AND logic operation, input 1 --> the result is displayed in r2811.0.
- [1]: AND logic operation, input 2 --> the result is displayed in r2811.0.

### r2811.0 CO/BO: AND logic operation result / AND result

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

- **Can be changed:** T
- **Calculated:** -
- **Access level:** 2
- **Data type:** Unsigned32
- **Dynamic index:** -
- **Func. diagram:** 2634
- **P-Group:** Functions
- **Units group:** -
- **Unit selection:** -
- **Not for motor type:** -
- **Scaling:** -
- **Expert list:** 1
- **Min:** -
- **Max:** -
- **Factory setting:** 0

**Description:** Displays the result of the AND logic operation.

**Bit field:** Bit  Signal name  1 signal  0 signal  FP
00  AND logic operation result  Yes  No  -

**Dependency:** Refer to: p2810

### p2816[0...1] BI: OR logic operation inputs / OR inputs

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

- **Can be changed:** T
- **Calculated:** -
- **Access level:** 2
- **Data type:** Unsigned32 / Binary
- **Dynamic index:** -
- **Func. diagram:** 2634
- **P-Group:** Functions
- **Units group:** -
- **Unit selection:** -
- **Not for motor type:** -
- **Scaling:** -
- **Expert list:** 1
- **Min:** -
- **Max:** -
- **Factory setting:** 0

**Description:** Sets the signal sources for the inputs of the OR logic operation.

**Dependency:** Refer to: r2817

**Note:**

- [0]: OR logic operation, input 1 --> the result is displayed in r2817.0.
- [1]: OR logic operation, input 2 --> the result is displayed in r2817.0.

### r2817.0 CO/BO: OR logic operation result / OR result

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

- **Can be changed:** T
- **Calculated:** -
- **Access level:** 2
- **Data type:** Unsigned32
- **Dynamic index:** -
- **Func. diagram:** 2634
- **P-Group:** Functions
- **Units group:** -
- **Unit selection:** -
- **Not for motor type:** -
- **Scaling:** -
- **Expert list:** 1
- **Min:** -
- **Max:** -
- **Factory setting:** 0

**Description:** Displays the result of the OR logic operation.

**Bit field:** Bit  Signal name  1 signal  0 signal  FP
00  OR logic operation result  Yes  No  -

**Dependency:** Refer to: p2816
**p2900[0...n]**  
**CO: Fixed value 1 [%] / Fixed value 1 [%]**  
*SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN*  
**Description:** Sets a fixed percentage.  
**Dependency:** Refer to: p2901, p2930  
**Notice:** A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.  
**Note:** The value can be used to interconnect a scaling function (e.g. scaling of the main setpoint)  
**Can be changed:** U, T  
**Calculated:** -  
**Access level:** 3  
**Dynamic index:** DDS, p0180  
**Func. diagram:** 1021  
**Units group:** -  
**Group:** Free function blocks  
**Scaling:** PERCENT  
**Expert list:** 1  
**Min:** -10000.00 [%]  
**Max:** 10000.00 [%]  
**Factory setting:** 0.00 [%]  
**Index:**  
[0] = Fixed value +0 %  
[1] = Fixed value +5 %  
[2] = Fixed value +10 %  
[3] = Fixed value +20 %  
[4] = Fixed value +50 %  
[5] = Fixed value +100 %  
[6] = Fixed value +150 %  
[7] = Fixed value +200 %  
[8] = Fixed value -5 %  
[9] = Fixed value -10 %  
[10] = Fixed value -20 %  
[12] = Fixed value -100 %  
[13] = Fixed value -150 %  
[14] = Fixed value -200 %  
**Dependency:** Refer to: p2900, p2930  
**Note:** The signal sources can, for example, be used to interconnect scalings.

**p2901[0...n]**  
**CO: Fixed value 2 [%] / Fixed value 2 [%]**  
*SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN*  
**Description:** Sets a fixed percentage.  
**Dependency:** Refer to: p2900, p2930  
**Notice:** A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.  
**Note:** The value can be used to interconnect a scaling function (e.g. scaling of the supplementary setpoint)  
**Can be changed:** U, T  
**Calculated:** -  
**Access level:** 3  
**Dynamic index:** DDS, p0180  
**Func. diagram:** 1021  
**Units group:** -  
**Group:** Free function blocks  
**Scaling:** PERCENT  
**Expert list:** 1  
**Min:** -10000.00 [%]  
**Max:** 10000.00 [%]  
**Factory setting:** 0.00 [%]  
**Index:**  
[0] = Fixed value +0 %  
[1] = Fixed value +5 %  
[2] = Fixed value +10 %  
[3] = Fixed value +20 %  
[4] = Fixed value +50 %  
[5] = Fixed value +100 %  
[6] = Fixed value +150 %  
[7] = Fixed value +200 %  
[8] = Fixed value -5 %  
[9] = Fixed value -10 %  
[10] = Fixed value -20 %  
[12] = Fixed value -100 %  
[13] = Fixed value -150 %  
[14] = Fixed value -200 %

**r2902[0...14]**  
**CO: Fixed values [%] / Fixed values [%]**  
*SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN*  
**Description:** Signal sources for frequently used percentage values.  
**Dependency:** Refer to: p2900, p2901, p2930  
**Note:** The signal sources can, for example, be used to interconnect scalings.
### Parameter List

#### p2930[0...n] CO: Fixed value M [Nm] / Fixed value M [Nm]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependencies</th>
<th>Notice</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Sets a fixed value for torque.</td>
<td>Refer to: p2900, p2901</td>
<td>A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.</td>
<td>The value can, for example, be used to interconnect a supplementary torque.</td>
</tr>
<tr>
<td>Can be changed: U, T</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P-Group: Free function blocks</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type: REL</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>-100000.00 [Nm]</td>
<td>100000.00 [Nm]</td>
<td>0.00 [Nm]</td>
<td></td>
</tr>
<tr>
<td>Max</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### p3016 MotId torque constant identified / kT ident

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependencies</th>
<th>Notice</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Torque constant for the synchronous motor determined by the motor data identification.</td>
<td>This torque constant can be changed after the identification and accepted in p0316 with p1910/p1960 = -3.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can be changed: U, T</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P-Group: Motor identification</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type: ASM, REL, FEM</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>0.00 [Nm/A]</td>
<td>100.00 [Nm/A]</td>
<td>0.00 [Nm/A]</td>
<td></td>
</tr>
<tr>
<td>Max</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### p3017 MotId voltage constant identified / kE ident

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependencies</th>
<th>Notice</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Voltage constant for a synchronous motor determined by the motor data identification.</td>
<td>This voltage constant can be changed after the identification and accepted in p0317 with p1910/p1960 = -3.</td>
<td>Units for rotating synchronous motors: Vrms/(1000 rpm), phase-to-phase</td>
<td></td>
</tr>
<tr>
<td>Can be changed: U, T</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P-Group: Motor identification</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type: ASM, REL, FEM</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>0.0 [Vrms]</td>
<td>10000.0 [Vrms]</td>
<td>0.0 [Vrms]</td>
<td></td>
</tr>
<tr>
<td>Max</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### p3020 MotId magnetizing current identified / I_mag ident

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependencies</th>
<th>Notice</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Magnetizing current for an induction motor determined by the motor data identification.</td>
<td>This magnetizing current can be changed after the identification and accepted in p0320 with p1910/p1960 = -3.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can be changed: U, T</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P-Group: Motor identification</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type: REL, FEM</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>0.000 [Arms]</td>
<td>5000.000 [Arms]</td>
<td>0.000 [Arms]</td>
<td></td>
</tr>
<tr>
<td>Max</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3
### p3027  MotId optimum load angle identified / \( \phi_{\text{load opt ident}} \)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SERVO_S110-CAN</strong></td>
<td>Optimum load angle for a synchronous motor determined by the motor data identification. This optimum load angle can be changed after the identification and accepted in p0327 with p1910/p1960 = -3.</td>
<td>Refer to: p0327, p1947, p1960</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Type</th>
<th>Access level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min</td>
<td>0.0 [°]</td>
<td>FloatingPoint32</td>
<td>3</td>
</tr>
<tr>
<td>Max</td>
<td>135.0 [°]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### p3028  MotId reluctance torque constant identified / \( k_{T_{\text{reluct}}} \)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SERVO_S110-CAN</strong></td>
<td>Reluctance torque constant for a synchronous motor determined by the motor data identification. This reluctance torque constant can be changed after the identification and accepted in p0328 with p1910/p1960 = -3.</td>
<td>Refer to: p0328, p1939, p1960</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Type</th>
<th>Access level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min</td>
<td>-1000.00 [mH]</td>
<td>FloatingPoint32</td>
<td>3</td>
</tr>
<tr>
<td>Max</td>
<td>1000.00 [mH]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factory setting</td>
<td>0.00 [mH]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### p3030  MotId angular commutation offset identified / \( \text{Ang_com offset} \)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SERVO_S110-CAN</strong></td>
<td>Angular commutation offset for a synchronous motor determined by the motor data identification. This angular commutation offset can be changed after the identification and accepted in p0431 with p1910/p1960 = -3.</td>
<td>Refer to: p0431, p1910, p1960, p1984</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Type</th>
<th>Access level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min</td>
<td>-180.00 [°]</td>
<td>FloatingPoint32</td>
<td>3</td>
</tr>
<tr>
<td>Max</td>
<td>180.00 [°]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factory setting</td>
<td>0.00 [°]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### p3031  MotId encoder inversion actual value identified / \( \text{EncInvActVal ident} \)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SERVO_S110-CAN</strong></td>
<td>Inversion of the encoder actual value determined by the motor data identification. This inversion can be changed after the identification and accepted in p0410 with p1910/p1960 = -3.</td>
<td>Refer to: p0410, p1910, p1960</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bit field</th>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>00</td>
<td>Invert speed actual value</td>
<td>Yes</td>
<td>No</td>
<td>4710, 4715</td>
</tr>
<tr>
<td></td>
<td>01</td>
<td>Invert position actual value</td>
<td>Yes</td>
<td>No</td>
<td>4704</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dependency</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Refer to: p0410, p1910, p1960</td>
</tr>
<tr>
<td>Parameter</td>
<td>Description</td>
</tr>
<tr>
<td>-----------</td>
<td>-------------</td>
</tr>
<tr>
<td><strong>p3041</strong> MotId moment of inertia identified / ( M_{\text{inertia\ ident}} )</td>
<td>Motor moment of inertia determined by the motor data identification. This motor moment of inertia can be changed after the identification and accepted in p0341 with ( p1910/p1960 = -3 ).</td>
</tr>
<tr>
<td><strong>p3042</strong> MotId load moment of inertia identified / ( \text{Load mom\ ident} )</td>
<td>Load moment of inertia determined by the motor data identification. This load moment of inertia can be changed after the identification and accepted in p1498 with ( p1910/p1960 = -3 ).</td>
</tr>
<tr>
<td><strong>p3049[0...n]</strong> MotId Speed at start of field weakening identified / ( \text{ident} )</td>
<td>Speed at the start of field weakening determined by the motor data identification. This start speed can be changed after the identification and accepted in p0348 with ( p1910/p1960 = -3 ).</td>
</tr>
<tr>
<td><strong>p3050[0...n]</strong> MotorId stator resistance identified / ( \text{R_stator\ ident} )</td>
<td>Stator resistance determined by the motor data identification. This stator resistance can be changed after the identification and accepted in p0350 with ( p1910/p1960 = -3 ).</td>
</tr>
<tr>
<td>Parameter</td>
<td>Description</td>
</tr>
<tr>
<td>-----------</td>
<td>-------------</td>
</tr>
<tr>
<td><strong>R_rotor ident</strong></td>
<td>Rotor resistance for an induction motor determined by the motor data identification. This stator resistance can be changed after the identification and accepted in p0354 with p1910/p1960 = -3.</td>
</tr>
<tr>
<td><strong>L_stator leak</strong></td>
<td>Stator leakage inductance determined by the motor data identification. This stator leakage inductance can be changed after the identification and accepted in p0356 with p1910/p1960 = -3.</td>
</tr>
<tr>
<td><strong>LRotor leak</strong></td>
<td>Rotor leakage inductance for an induction motor determined by the motor data identification. This rotor leakage inductance can be changed after the identification and accepted in p0358 with p1910/p1960 = -3.</td>
</tr>
<tr>
<td><strong>MotLh ident</strong></td>
<td>Magnetizing inductance for an induction motor determined by the motor data identification. This magnetizing inductance can be changed after the identification and accepted in p0360 with p1910/p1960 = -3.</td>
</tr>
</tbody>
</table>
### p3080 MotId flux controller P gain identified / Flux ctrl Kp ident

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Access level</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p3080</td>
<td>P gain of the flux controller for an induction motor determined by the motor data identification. This P gain can be changed after the identification and accepted in p1590 with p1910/p1960 = -3.</td>
<td>3</td>
<td>0.0 [A/Vs]</td>
<td>999999.0 [A/Vs]</td>
<td>0.0 [A/Vs]</td>
</tr>
</tbody>
</table>

Dependency: Refer to: p1590, p1910

### p3081 MotId flux controller integral time identified / Flux ctrl Tn ident

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Access level</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p3081</td>
<td>Integral time of the flux controller for an induction motor determined by the motor data identification. This integral time can be changed after the identification and accepted in p1592 with p1910/p1960 = -3.</td>
<td>3</td>
<td>0 [ms]</td>
<td>10000 [ms]</td>
<td>0 [ms]</td>
</tr>
</tbody>
</table>

Dependency: Refer to: p1592, p1910

### p3082 MotId current controller P gain identified / I_ctrl Kp ident

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Access level</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p3082</td>
<td>P gain of the current controller determined by the motor data identification. This P gain can be changed after the identification and accepted in p1715 with p1910/p1960 = -3.</td>
<td>3</td>
<td>0.000 [V/A]</td>
<td>100000.000 [V/A]</td>
<td>0.000 [V/A]</td>
</tr>
</tbody>
</table>

Dependency: Refer to: p1715, p1910

### p3083 MotId current controller integral time identified / I_ctrl Tn ident

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Access level</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p3083</td>
<td>Integral time of the current controller determined by the motor data identification. This integral time can be changed after the identification and accepted in p1717 with p1910/p1960 = -3.</td>
<td>3</td>
<td>0.00 [ms]</td>
<td>1000.00 [ms]</td>
<td>0.00 [ms]</td>
</tr>
</tbody>
</table>

Dependency: Refer to: p1717, p1910
**Parameter**

**List of parameters**

**p3088**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MotId Motor model changeover speed operation with encoder ident.</strong> / <strong>MotMod n_chgSnsorl</strong></td>
<td>Changeover speed for the motor model with encoder determined by the motor data identification. This changeover speed can be changed after the identification and accepted in p1752 with p1910/p1960 = -3.</td>
</tr>
<tr>
<td><strong>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</strong></td>
<td>Can be changed: U, T Calculated: CALC_MOD_ALL Access level: 3</td>
</tr>
<tr>
<td><strong>Data type:</strong></td>
<td>Dynamic index: - Units group: - Unit selection: -</td>
</tr>
<tr>
<td><strong>P-Group:</strong></td>
<td>Motor identification Scaling: - Expert list: 1</td>
</tr>
<tr>
<td><strong>Not for motor type:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Min</strong></td>
<td>Max</td>
</tr>
<tr>
<td>0.00000 [rpm]</td>
<td>210000.00000 [rpm] 0.00000 [rpm]</td>
</tr>
<tr>
<td><strong>Dependency:</strong></td>
<td>Refer to: p1752, p1910</td>
</tr>
</tbody>
</table>

**p3100**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>RTC time stamp mode / RTC t_stamp mode</strong></td>
<td>Sets the mode for the time stamp. p3100 = 0: Time stamp, operating hours p3100 = 1: Time stamp, UTC format</td>
</tr>
<tr>
<td><strong>CU_S110-CAN, CU_S110-DP, CU_S110-PN</strong></td>
<td>Can be changed: U, T Calculated: - Access level: 3</td>
</tr>
<tr>
<td><strong>Data type:</strong></td>
<td>Dynamic index: - Units group: - Unit selection: -</td>
</tr>
<tr>
<td><strong>P-Group:</strong></td>
<td>-</td>
</tr>
<tr>
<td><strong>Not for motor type:</strong></td>
<td>Scaling: - Expert list: 1</td>
</tr>
<tr>
<td><strong>Min</strong></td>
<td>Max</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td><strong>Note:</strong></td>
<td>RTC: Real-time clock UTC: Universal Time Coordinates The UTC time started, according to the definition on 01.01.1970 at 00:00:00 and is output in days and milliseconds.</td>
</tr>
</tbody>
</table>

**p3101[0...1]**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>RTC set UTC time / RTC set UTC</strong></td>
<td>Setting the UTC time. This means that the drive system is synchronized to the time specified by the time master. To start p3101[1] must be written to followed by p3101[0]. After writing to p3101[0], the UTC time is accepted. p3101[0]: Milliseconds p3101[1]: Days</td>
</tr>
<tr>
<td><strong>CU_S110-CAN, CU_S110-DP, CU_S110-PN</strong></td>
<td>Can be changed: U, T Calculated: - Access level: 3</td>
</tr>
<tr>
<td><strong>Data type:</strong></td>
<td>Dynamic index: - Units group: - Unit selection: -</td>
</tr>
<tr>
<td><strong>P-Group:</strong></td>
<td>-</td>
</tr>
<tr>
<td><strong>Not for motor type:</strong></td>
<td>Scaling: - Expert list: 0</td>
</tr>
<tr>
<td><strong>Min</strong></td>
<td>Max</td>
</tr>
<tr>
<td>0</td>
<td>4294967295 0</td>
</tr>
</tbody>
</table>
| **r3102[0...1]**
<p>| <strong>RTC read UTC time / RTC read UTC</strong> | Displays the current UTC time in the drive system. p3102[0]: Milliseconds p3102[1]: Days |
| <strong>CU_S110-CAN, CU_S110-DP, CU_S110-PN</strong> | Can be changed: - Calculated: - Access level: 3 |
| <strong>Data type:</strong> | Dynamic index: - Units group: - Unit selection: - |
| <strong>P-Group:</strong> | - |
| <strong>Not for motor type:</strong> | Scaling: - Expert list: 1 |</p>
<table>
<thead>
<tr>
<th><strong>Min</strong></th>
<th>Max</th>
</tr>
</thead>
</table>
### p3103 RTC synchronization source / RTC sync_source

**CU_S110-CAN, CU_S110-DP, CU_S110-PN**

- **Can be changed:** U, T
- **Data type:** Integer16
- **P-Group:** -
- **Not for motor type:** -
- **Min:** 0
- **Max:** 3

**Description:** Sets the synchronization source/technique.

**Value:**
- 0: PROFIBUS
- 1: PROFINET
- 2: PPI
- 3: PROFINET PTP

**Notice:**
- The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

### p3104 BI: RTC real time synchronization PING / RTC PING

**CU_S110-CAN, CU_S110-DP, CU_S110-PN**

- **Can be changed:** U, T
- **Data type:** Unsigned32 / Binary
- **P-Group:** -
- **Not for motor type:** -
- **Min:** -
- **Max:** -

**Description:**
- Sets the signal source for the PING event to set the UTC time.
- The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

### r3108[0...1] RTC last synchronization deviation / RTC sync_dev

**CU_S110-CAN, CU_S110-DP, CU_S110-PN**

- **Can be changed:** -
- **Data type:** Unsigned32
- **P-Group:** -
- **Not for motor type:** -
- **Min:** -
- **Max:** -

**Description:**
- Displays the last synchronization deviation that was determined.
- r3108[0]: Milliseconds
- r3108[1]: Days

### p3109 RTC real time synchronization, tolerance window / RTC sync tol

**CU_S110-CAN, CU_S110-DP, CU_S110-PN**

- **Can be changed:** U, T
- **Data type:** Unsigned16
- **P-Group:** -
- **Not for motor type:** -
- **Min:** 0 [ms]
- **Max:** 1000 [ms]

**Description:**
- Sets the tolerance window for time synchronization.
  - When this tolerance window is exceeded, an appropriate alarm is output.

**Dependency:**
- Refer to: A01099
r3114.9...11  CO/BO: Messages status word global / Msg ZSW global

**Description:**
Displays the global status word for messages. The appropriate bit is set if at least one message is present at the drive objects.

**Bit field:**
<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>09</td>
<td>Alarm present</td>
<td>Yes</td>
<td>No</td>
<td>8065</td>
</tr>
<tr>
<td>10</td>
<td>Fault present</td>
<td>Yes</td>
<td>No</td>
<td>8060</td>
</tr>
<tr>
<td>11</td>
<td>Safety message present</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
</tbody>
</table>

**Note:**
The status bits are displayed with delay.

---

r3115[0...63]  Fault drive object initiating / F DO initiating

**Description:**
Displays the drive object number of the initiating drive object for this fault as integer number. Value = 63; The fault was initiated by the drive object itself.

**Dependency:**
Refer to: r0945, r0947, r0948, r0949, r2109, r2130, r2133, r2136, r3120, r3122

**Note:**
The buffer parameters are cyclically updated in the background (refer to status signal in r2139). The structure of the fault buffer and the assignment of the indices is shown in r0945.

---

p3116  BI: Acknowledgement automatically suppressed / Ackn suppress

**Description:**
Sets the signal source for the automatic acknowledgement on the device drive object.

**Dependency:**
Refer to: p2102, p2103, p2104, p2105

**Note:**
When selecting a standard telegram, the BICO interconnection for control signal STW1.10 (master control by PLC) is automatically established.
**p3117 Change safety message type / Ch. SI mess type**

CU_S110-CAN, CU_S110-DP, CU_S110-PN

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p3117</td>
<td>Sets the re-parameterization of all safety messages for faults and alarms.</td>
<td></td>
<td>A change only becomes effective after a POWER ON.</td>
</tr>
</tbody>
</table>

**r3120[0...63] Component number fault / Comp_num flt**

All objects

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>r3120</td>
<td>Displays the component number of the fault which has occurred.</td>
<td>Refer to: r0945, r0947, r0948, r0949, r2109, r2130, r2133, r2136, r3122</td>
<td>Value = 0: Assignment to a component not possible.</td>
</tr>
</tbody>
</table>

**r3121[0...63] Component number alarm / Comp_num alarm**

All objects

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>r3121</td>
<td>Displays the component number of the alarm which has occurred.</td>
<td>Refer to: r2110, r2122, r2123, r2124, r2125, r2134, r2145, r2146, r3123</td>
<td>Value = 0: Assignment to a component not possible.</td>
</tr>
</tbody>
</table>

**r3122[0...63] Diagnostic attribute fault / Diag_attr fault**

All objects

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>r3122</td>
<td>Displays the diagnostic attribute of the fault which has occurred.</td>
<td>Refer to: r0945, r0947, r0948, r0949, r2109, r2130, r2133, r2136, r3120</td>
<td></td>
</tr>
</tbody>
</table>
Note: The buffer parameters are cyclically updated in the background (refer to status signal in r2139). The structure of the fault buffer and the assignment of the indices is shown in r0945.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Note:</th>
</tr>
</thead>
<tbody>
<tr>
<td>r3123[0...63]</td>
<td>Diagnostic attribute alarm / Diag_attr alarm</td>
<td>Refer to: r2110, r2122, r2123, r2124, r2125, r2134, r2145, r2146, r3121</td>
<td>The structure of the alarm buffer and the assignment of the indices is shown in r2122.</td>
</tr>
<tr>
<td>r3131</td>
<td>CO: Current flt value / Current flt value</td>
<td>Refer to: r2131, r3132</td>
<td></td>
</tr>
<tr>
<td>r3132</td>
<td>CO: Actual component number / Act comp_no.</td>
<td>Refer to: r2131, r3131</td>
<td></td>
</tr>
<tr>
<td>p3135</td>
<td>Suppress active fault / Supp act flt</td>
<td>Refer to: p0491, r2139</td>
<td>Depending on the suppression of a fault reaction in this parameter, r2139.1 &quot;Acknowledgement required&quot; is set when at least one fault occurs. Re bit 08: The suppression is only effective if p0491 = 1.</td>
</tr>
</tbody>
</table>
### p3233[0...n] Torque actual value filter, time constant / M_act_filt T

<table>
<thead>
<tr>
<th>SERVO_S110-CAN (Ext msg)</th>
<th>SERVO_S110-DP (Ext msg)</th>
<th>SERVO_S110-PN (Ext msg)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description:</strong></td>
<td>Sets the time constant of the PT1 element to smooth the torque actual value.</td>
<td>The smoothed actual torque is compared with the threshold values and is only used for messages and signals.</td>
</tr>
</tbody>
</table>

- **Can be changed:** U, T
- **Data type:** FloatingPoint32
- **Dynamic index:** DDS, p0180
- **P-Group:** Messages
- **Unit selection:** -
- **Not for motor type:** -
- **Scaling:** -
- **Min:** 0 [ms]
- **Max:** 1000000 [ms]
- **Factory setting:** 0 [ms]

### p3235 Phase failure signal motor monitoring time / Ph_fail_t_monit

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description:</strong> Sets the monitoring time for phase failure detection of the motor.</td>
</tr>
<tr>
<td><strong>Notice:</strong> After the value has been modified, no further parameter modifications can be made and the status is shown in r3996. Modifications can be made again when r3996 = 0.</td>
</tr>
<tr>
<td><strong>Note:</strong> For p3235 = 0 the function is deactivated.</td>
</tr>
</tbody>
</table>

- **Can be changed:** U, T
- **Data type:** FloatingPoint32
- **Dynamic index:** -
- **P-Group:** Messages
- **Units group:** -
- **Unit selection:** -
- **Not for motor type:** -
- **Scaling:** -
- **Min:** 0 [ms]
- **Max:** 2000 [ms]
- **Factory setting:** 320 [ms]

### p3290 Variable signaling function start / Var sig start

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description:</strong> Settings for start/stop and the comparison type for the variable signaling function.</td>
</tr>
</tbody>
</table>

- **Can be changed:** U, T
- **Data type:** Unsigned8
- **Dynamic index:** -
- **P-Group:** -
- **Units group:** -
- **Unit selection:** -
- **Not for motor type:** -
- **Scaling:** -
- **Min:** -
- **Max:** -
- **Factory setting:** 0010 bin

### Bit field:

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Activate function</td>
<td>Active</td>
<td>Not active</td>
<td>-</td>
</tr>
<tr>
<td>01</td>
<td>Comparison with sign</td>
<td>With sign</td>
<td>Without sign</td>
<td>-</td>
</tr>
</tbody>
</table>

### p3291 Ci: Variable signaling function signal source / Var sig S_src

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description:</strong> Sets the signal source for the variable signaling function.</td>
</tr>
<tr>
<td><strong>Dependency:</strong> Refer to: p3292, p3293</td>
</tr>
<tr>
<td><strong>Note:</strong> Re p3291 = 1:</td>
</tr>
</tbody>
</table>

In this case, the signal source is defined using p3292 and p3293.
### p3292  Variable signaling function signal source address / Var sig S_src addr

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Can be changed: U, T  Calculated: - Access level: 4</td>
</tr>
<tr>
<td>Data type: Unsigned32</td>
<td>Dynamic index: -  Unit selection: - Func. diagram: 5301</td>
</tr>
<tr>
<td>P-Group: -</td>
<td>Units group: -  Expert list: 1</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td>0000 hex</td>
<td>FFFF FFFF hex</td>
</tr>
</tbody>
</table>

**Description:** Sets the address of the signal source for the variable signaling function.

**Caution:** If an incorrect address and data type are set, then this can cause the software to crash.

**Note:** This parameter should only be set for p3291 = 1.

### p3293  Variable signaling function signal source data type / Var sig S_src type

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Can be changed: U, T  Calculated: - Access level: 4</td>
</tr>
<tr>
<td>Data type: Integer16</td>
<td>Dynamic index: -  Unit selection: - Func. diagram: 5301</td>
</tr>
<tr>
<td>P-Group: -</td>
<td>Units group: -  Expert list: 1</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td>0</td>
<td>7</td>
</tr>
</tbody>
</table>

**Description:** Sets the data type of the signal source for the variable signaling function.

**Value:**
- 0: Unknown
- 1: U8, Unsigned8
- 2: I8, Signed8
- 3: U16, Unsigned16
- 4: I16, Signed16
- 5: U32, Unsigned32
- 6: I32, Signed32
- 7: Float, FloatingPoint32

**Dependency:** Refer to: p3291

**Caution:** If an incorrect address and data type are set, then this can cause the software to crash.

**Note:** This parameter should only be set for p3291 = 1.

### r3294  BO: Variable signaling function output signal / Var sig outp_sig

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Can be changed: -  Calculated: - Access level: 3</td>
</tr>
<tr>
<td>Data type: Unsigned8</td>
<td>Dynamic index: -  Unit selection: - Func. diagram: 5301</td>
</tr>
<tr>
<td>P-Group: -</td>
<td>Units group: -  Expert list: 1</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Description:** Displays the output signal for the variable signaling function.

**Dependency:** Refer to: p3290, p3291, p3295, p3296, p3297, p3298
### Parameter: Variable signaling function threshold value / Var sig thresh_val

**Parameter:** p3295  
**Description:** Sets the threshold value for the variable signaling function.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Default</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p3295</td>
<td>Variable signaling function threshold value / Var sig thresh_val</td>
<td>-340.28235E36</td>
<td>0.000</td>
</tr>
</tbody>
</table>

**CAN be changed:** U, T  
**Data type:** FloatingPoint32  
**P-Group:** -  
**Not for motor type:** -  
**Min:** -340.28235E36  
**Max:** 340.28235E36  
**Access level:** 3  
**Func. diagram:** 5301

### Parameter: Variable signaling function hysteresis / Var sig hyst

**Parameter:** p3296  
**Description:** Sets the hysteresis for the variable signaling function.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Default</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p3296</td>
<td>Variable signaling function hysteresis / Var sig hyst</td>
<td>0.000</td>
<td>0.000</td>
</tr>
</tbody>
</table>

**CAN be changed:** U, T  
**Data type:** FloatingPoint32  
**P-Group:** -  
**Not for motor type:** -  
**Min:** 0.000  
**Max:** 340.28235E36  
**Access level:** 3  
**Func. diagram:** 5301

### Parameter: Variable signaling function pickup delay / Var sig t_pickup

**Parameter:** p3297  
**Description:** Sets the pickup delay for the variable signaling function.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Default</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p3297</td>
<td>Variable signaling function pickup delay / Var sig t_pickup</td>
<td>0 [ms]</td>
<td>0 [ms]</td>
</tr>
</tbody>
</table>

**CAN be changed:** U, T  
**Data type:** Unsigned16  
**P-Group:** -  
**Not for motor type:** -  
**Min:** 0 [ms]  
**Max:** 10000 [ms]  
**Access level:** 3  
**Func. diagram:** 5301

### Parameter: Variable signaling function dropout delay / Var sig t_dropout

**Parameter:** p3298  
**Description:** Sets the dropout delay for the variable signaling function.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Default</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p3298</td>
<td>Variable signaling function dropout delay / Var sig t_dropout</td>
<td>0 [ms]</td>
<td>0 [ms]</td>
</tr>
</tbody>
</table>

**CAN be changed:** U, T  
**Data type:** Unsigned16  
**P-Group:** -  
**Not for motor type:** -  
**Min:** 0 [ms]  
**Max:** 10000 [ms]  
**Access level:** 3  
**Func. diagram:** 5301

---

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SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3  
1-433
### p3299 Variable signaling function, sampling time / Var sig t_sample

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Notice</th>
<th>Value</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</strong></td>
<td>Sets the sampling time for the variable signaling function.</td>
<td>The following must apply for the setting: Sampling time (p3299) &lt;= pickup delay (p3297), dropout delay (p3298)</td>
<td><strong>1.000</strong>, <strong>2.000</strong>, <strong>3.000</strong>, <strong>4.000</strong></td>
<td>Only the following values can be set: <strong>1.000</strong>, <strong>2.000</strong>, <strong>3.000</strong>, <strong>4.000</strong></td>
</tr>
</tbody>
</table>

#### Data type: FloatingPoint32
#### P-Group: -
#### Not for motor type: -
#### Min: 1.000 [ms]
#### Max: 4.000 [ms]
#### Factory setting: 4.000 [ms]

### p3900 Completion of quick commissioning / Compl quick_comm

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Notice</th>
<th>Value</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</strong></td>
<td>Exits quick commissioning (p0010 = 1) with automatic calculation of all parameters of all existing drive data sets that depend on the entries made during quick commissioning.</td>
<td>After the value has been modified, no further parameter modifications can be made and the status is shown in r3996. Modifications can be made again when r3996 = 0.</td>
<td><strong>0</strong>, <strong>1</strong>, <strong>2</strong>, <strong>3</strong></td>
<td>When calculating motor, open-loop and closed-loop control parameters (such as for p0340 = 1) parameters associated with a selected Siemens catalog motor are not overwritten. If a catalog motor has not been selected (see p0300), then the following parameters are reset with p3900 &gt; 0 in order to restore the situation that applied when commissioning the drive for the first time: for induction motors p0320, p0352, p0353, p0604, p0605, p0626 ... p0628. for synchronous motors p0326, p0327, p0352, p0353, p0391 ... p0393, p0604, p0605.</td>
</tr>
</tbody>
</table>

#### Data type: Integer16
#### P-Group: Displays, signals
#### Not for motor type: -
#### Min: 0
#### Max: 3
#### Factory setting: 0

### r3925[0...n] Identification final display / Ident final_disp

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Notice</th>
<th>Value</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</strong></td>
<td>Displays the commissioning steps that have been carried out.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Data type: Unsigned32
#### P-Group: Motor
#### Not for motor type: -
#### Min: -
#### Max: -
#### Factory setting: -
### List of parameters

#### Parameter

Note:
The individual bits are only set if the appropriate action has been initiated and successfully completed.

When motor rating plate parameters are changed, the final display is reset.

When setting the individual bits, all of the most significant bits are reset.

#### r3927[0...n]

**Motor data identification induction motor data determined / MotID ASM dat det**

<table>
<thead>
<tr>
<th>Bit field</th>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td></td>
<td>p0350 accepted</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>01</td>
<td></td>
<td>p0354 accepted</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>02</td>
<td></td>
<td>p0356 accepted</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>03</td>
<td></td>
<td>p0358 accepted</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>04</td>
<td></td>
<td>p0360 accepted</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>05</td>
<td></td>
<td>p0320 accepted</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>06</td>
<td></td>
<td>p0410 accepted</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>07</td>
<td></td>
<td>p1715 accepted</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>08</td>
<td></td>
<td>p1717 accepted</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>09</td>
<td></td>
<td>p1590 accepted</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>p1592 accepted</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td></td>
<td>p0341 accepted</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
<td>p0348 accepted</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td></td>
<td>p1752 accepted</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>

Dependency:
Refer to: r3925

Description:
Displays the data of an induction motor determined and accepted from the stationary motor data identification or rotating measurement.

#### r3928[0...n]

**Motor data identification synchronous motor data determined / MotId PEM dat det**

<table>
<thead>
<tr>
<th>Bit field</th>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td></td>
<td>p0350 accepted</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>01</td>
<td></td>
<td>p0356 accepted</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>02</td>
<td></td>
<td>p0410 accepted</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>03</td>
<td></td>
<td>p0341 accepted</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>04</td>
<td></td>
<td>p1952 accepted</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>05</td>
<td></td>
<td>p1953 accepted</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>06</td>
<td></td>
<td>p1715 accepted</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>

Dependency:
Successfully completed component of the last rotating measurement carried out.

Description:
Successfully completed component of the last rotating measurement carried out.
### List of parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value 1</th>
<th>Value 2</th>
<th>Value 3</th>
<th>Value 4</th>
<th>Value 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>13 p1717 accepted</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>18 p0316 accepted</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>19 p0317 accepted</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>20 p0327 accepted</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>21 p0328 accepted</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>22 p0341 accepted</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>23 kT characteristic parameter accepted</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>24 p0348 accepted</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Dependency:** Refer to: r3925

#### r3930[0...4]
**Power unit EEPROM characteristics / PU characteristics**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value 1</th>
<th>Value 2</th>
<th>Value 3</th>
<th>Value 4</th>
<th>Value 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>CU_S110-CAN, CU_S110-DP, CU_S110-PN</td>
<td>Displays the characteristics (A5E number and versions) of the power unit.</td>
<td>[0]: A5E number xxxx (A5Exxxxyyyy)</td>
<td>[1]: A5E number yyyy (A5Exxxxyyyy)</td>
<td>[2]: File version (logistic)</td>
<td>[3]: File version (fixed data)</td>
<td>[4]: File version (calib data)</td>
</tr>
</tbody>
</table>

#### p3950
**Service parameter / Serv. par.**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value 1</th>
<th>Value 2</th>
<th>Value 3</th>
<th>Value 4</th>
<th>Value 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>CU_S110-CAN, CU_S110-DP, CU_S110-PN</td>
<td>For service personnel only.</td>
<td>C1, U, T</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

#### r3974
**Drive unit status word / Drv_unit ZSW**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value 1</th>
<th>Value 2</th>
<th>Value 3</th>
<th>Value 4</th>
<th>Value 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>CU_S110-CAN, CU_S110-DP, CU_S110-PN</td>
<td>Displays the status word for the drive unit.</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Bit field:**

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Software reset active</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>01</td>
<td>Writing of parameters disabled as parameter save in progress</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>02</td>
<td>Writing of parameters disabled as macro is running</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
</tbody>
</table>
### List of parameters

#### r3977  BICO counter, topology / BICO counter topo

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CU_S110-CAN, CU_S110-DP, CU_S110-PN</strong></td>
<td>Displays the BICO interconnections that have been parameterized in the complete (overall) topology. The counter is incremented by one for each modified BICO interconnection.</td>
<td>Refer to: r3978</td>
</tr>
</tbody>
</table>

#### r3978  BICO CounterDevice / BICO CounterDevice

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CU_S110-CAN, CU_S110-DP, CU_S110-PN</strong></td>
<td>Displays the counter reading for modified BICO interconnections on this device. The counter is incremented by one for each modified BICO interconnection.</td>
<td></td>
</tr>
</tbody>
</table>

#### p3981  Faults, acknowledge drive object / Faults ackn DO

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>All objects</strong></td>
<td>Setting to acknowledge all active faults of a drive object. Parameter should be set from 0 to 1 to acknowledge. After acknowledgement, the parameter is automatically reset to 0.</td>
<td></td>
</tr>
</tbody>
</table>

#### p3985  Master control mode selection / PcCtrl mode select

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Danger</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</strong></td>
<td>Sets the mode to change over the master control / LOCAL mode.</td>
<td>0: Change master control for STW1.0 = 0 1: Change master control in operation</td>
<td>When changing the master control in operation, the drive can manifest undesirable behavior - e.g. it can accelerate up to another setpoint.</td>
</tr>
</tbody>
</table>
**Parameter List of parameters**

**r3986 Parameter count / Parameter No.**
- **CU_S110-CAN, CU_S110-DP, CU_S110-PN**
- **Can be changed:** -  
- **Data type:** Unsigned16  
- **P-Group:** -  
- **Not for motor type:** -  
- **Min**  
  -  
  -  
  -  
  -  
- **Max**  
  -  
  -  
  -  
  -  
- **Factory setting**  
  -  
  -  
  -  
  -  

**Description:** Displays the number of parameters for this drive unit. The number comprises the device-specific and the drive-specific parameters.

**Dependency:** Refer to: r0980, r0981, r0989

**r3988[0...1] Boot state / Boot_state**
- **CU_S110-CAN, CU_S110-DP, CU_S110-PN**
- **Can be changed:** -  
- **Data type:** Integer16  
- **P-Group:** -  
- **Not for motor type:** -  
- **Min**  
  - 0  
  - 10800  
  -  
  -  
- **Max**  
  -  
  -  
  -  
  -  
- **Factory setting**  
  -  

**Description:**
- **Index 0:** Displays the boot state.
- **Index 1:** Displays the partial boot state

**Value:**
- 0: Not active
- 1: Fatal fault
- 10: Fault
- 20: Reset all parameters
- 30: Drive object modified
- 40: Download using commissioning software
- 50: Parameter download using commissioning software
- 90: Reset Control Unit and delete drive objects
- 100: Start initialization
- 110: Instantiate Control Unit basis
- 150: Wait until actual topology determined
- 160: Evaluate topology
- 170: Instantiate Control Unit reset
- 180: Initialization YDB configuration information
- 200: First commissioning
- 210: Create drive packages
- 250: Wait for topology acknowledge
- 325: Wait for input of drive type
- 350: Determine drive type
- 360: Write into topology-dependent parameters
- 370: Wait until p0009 = 0 is set
- 380: Check topology
- 550: Call conversion functions for parameter
- 625: Wait non-cyclic starting DRIVE-CLiQ
- 650: Start cyclic operation
- 660: Evaluate drive commissioning status
- 670: Autom. FW update DRIVE-CLiQ components
- 680: Wait for CU LINK slaves
- 690: Wait non-cyclic starting DRIVE-CLiQ
- 700: Save parameters
- 725: Wait until DRIVE-CLiQ cyclic
- 740: Check the ability to operate
- 745: Start of the time slices
- 750: Interrupt enable
- 800: Initialization finished
- 10050: Wait for synchronization
10100: Wait for CU LINK slaves
10150: Wait until actual topology determined
10200: Evaluation component status
10250: Call conversion functions for parameter
10300: Preparation cyclic operation
10350: Autom. FW update DRIVE-CLiQ components
10400: Wait for slave properties
10450: Check CX/NX status
10500: Wait until DRIVE-CLiQ cyclic
10550: Carry out warm start
10600: Evaluate, encoder status
10800: Partial boot completed

Index:
[0] = System
[1] = Partial boot

**r3998[0...n]**  
First drive commissioning / First drv_comm

<table>
<thead>
<tr>
<th>SERVO_S110-CAN,</th>
<th>Can be changed: -</th>
<th>Calculated: -</th>
<th>Access level: 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-DP,</td>
<td>Data type: Unsigned16</td>
<td>Dynamic index: DDS, p0180</td>
<td>Func. diagram: -</td>
</tr>
<tr>
<td>SERVO_S110-PN</td>
<td>P-Group: -</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>65535</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Description: Displays whether the drive still has to be commissioned for the first time.
0 = Yes
2 = No

**r4640[0...95]**  
Encoder diagnostics state machine / Enc diag SM

<table>
<thead>
<tr>
<th>SERVO_S110-CAN,</th>
<th>Can be changed: -</th>
<th>Calculated: -</th>
<th>Access level: 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-DP,</td>
<td>Data type: Unsigned32</td>
<td>Dynamic index: -</td>
<td>Func. diagram: -</td>
</tr>
<tr>
<td>SERVO_S110-PN</td>
<td>P-Group: Encoder</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Description: Displays the encoder diagnostics for the PROFIdrive interface.

**p4650**  
Encoder functional reserve component number / Enc fct_res num

<table>
<thead>
<tr>
<th>CU_S110-CAN,</th>
<th>Can be changed: U, T</th>
<th>Calculated: -</th>
<th>Access level: 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>CU_S110-DP,</td>
<td>Data type: Unsigned16</td>
<td>Dynamic index: -</td>
<td>Func. diagram: -</td>
</tr>
<tr>
<td>CU_S110-PN</td>
<td>P-Group: Displays, signals</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>399</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Description: Sets the component number (p0141) of the encoder whose functional reserve is to be displayed (r4651).

**r4651[0...3]**  
Encoder functional reserve / Enc fct_reserve

<table>
<thead>
<tr>
<th>CU_S110-CAN,</th>
<th>Can be changed: -</th>
<th>Calculated: -</th>
<th>Access level: 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>CU_S110-DP,</td>
<td>Data type: FloatingPoint32</td>
<td>Dynamic index: -</td>
<td>Func. diagram: -</td>
</tr>
<tr>
<td>CU_S110-PN</td>
<td>P-Group: Displays, signals</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td>- [%]</td>
<td>- [%]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Description: Displays the functional reserve of the encoder selected via p4650.
0 ... 25 %: The function limit has been reached. A service is recommended.
Parameter

List of parameters

26 ... 100 %:
The encoder is working in the specified range.

Index:

- [0] = Incremental
- [1] = Reserved
- [2] = Abs track
- [3] = Code conn

Dependency:
Refer to: p4650

Note:
- Value = 999 means:
  - the component specified in p4650 is not connected
  - the encoder does not support the display of the functional reserve

**p4660[0...2]**  Sensor Module filter bandwidth / SM Filt_bandw

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type: FloatingPoint32</td>
</tr>
<tr>
<td>P-Group: Encoder</td>
</tr>
<tr>
<td>Not for motor type: -</td>
</tr>
<tr>
<td>Min</td>
</tr>
<tr>
<td>Max</td>
</tr>
<tr>
<td>0.00 [kHz]</td>
</tr>
<tr>
<td>20000.00 [kHz]</td>
</tr>
</tbody>
</table>

**Description:**
Sets the filter bandwidth for Sensor Module SMx10 (resolver) and SMx20 (sin/cos).
The value set on the Sensor Module is displayed in r4661.
The Sensor Module hardware only supports the following values:
- 0: The Sensor Module's default is used.
- 50 kHz
- 170 kHz
- 500 kHz
- Unlimited: Only the bandwidth of the operational amplifier is effective.

Index:

- [0] = Encoder 1
- [1] = Encoder 2
- [2] = Reserved

Dependency:
Refer to: r4661

Note:
A value of zero is displayed if an encoder is not present.

**r4661[0...2]**  Sensor Module filter bandwidth display / SM Filt_bandw disp

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type: FloatingPoint32</td>
</tr>
<tr>
<td>P-Group: Encoder</td>
</tr>
<tr>
<td>Not for motor type: -</td>
</tr>
<tr>
<td>Min</td>
</tr>
<tr>
<td>Max</td>
</tr>
<tr>
<td>- [kHz]</td>
</tr>
<tr>
<td>- [kHz]</td>
</tr>
</tbody>
</table>

**Description:**
Display of the effective filter bandwidth for Sensor Module SMx10 (resolver) and SMx20 (sin/cos).
The bandwidth of the filter is set using p4660.

Index:

- [0] = Encoder 1
- [1] = Encoder 2
- [2] = Reserved

Dependency:
Refer to: p4660

Note:
A value of zero is displayed if an encoder is not present.
**Parameter List**

**p4662[0...n]**  
**Encoder characteristic type / Enc char_type**

- **SERVO_S110-CAN**
- **SERVO_S110-DP**
- **SERVO_S110-PN**

**Can be changed:** C2(4)  
**Data type:** Integer16  
**P-Group:** Encoder  
**Not for motor type:** -  
**Min:** 0  
**Max:** 1  
**Factory setting:** 0

**Description:**  
Sets the characteristic type.

For non-linear sensors, the interrelationship between the signal voltage and the position can be defined using a third degree polynomial.

**Value:**  
0: Characteristic inactive  
1: Characteristic polynomial third degree

**Dependency:**  
Refer to: p4663, p4664, p4665, p4666

**Note:**  
If value = 1:  
A third degree polynomial is defined as follows:  
\[ F(x) = K3 \cdot x^3 + K2 \cdot x^2 + K1 \cdot x + K0 \]  
The coefficients \( K0 \) ... \( K3 \) should be defined and entered into p4663 ... p4666.  
The sensor range is emulated to \( x = -0.5 \) ... +0.5.

**p4663[0...n]**  
**Encoder characteristic K0 / Enc char K0**

- **SERVO_S110-CAN**
- **SERVO_S110-DP**
- **SERVO_S110-PN**

**Can be changed:** U, T  
**P-Group:** -  
**Not for motor type:** -  
**Min:** -  
**Max:** -  
**Factory setting:** -

**Description:**  
Setting for coefficient K0 to calculate the characteristic (p4662).

**Dependency:**  
Refer to: p4662, p4664, p4665, p4666

**p4664[0...n]**  
**Encoder characteristic K1 / Enc char K1**

- **SERVO_S110-CAN**
- **SERVO_S110-DP**
- **SERVO_S110-PN**

**Can be changed:** U, T  
**P-Group:** -  
**Not for motor type:** -  
**Min:** -  
**Max:** -  
**Factory setting:** -

**Description:**  
Setting for coefficient K1 to calculate the characteristic (p4662).

**Dependency:**  
Refer to: p4662, p4663, p4665, p4666

**p4665[0...n]**  
**Encoder characteristic K2 / Enc char K2**

- **SERVO_S110-CAN**
- **SERVO_S110-DP**
- **SERVO_S110-PN**

**Can be changed:** U, T  
**P-Group:** -  
**Not for motor type:** -  
**Min:** -  
**Max:** -  
**Factory setting:** -

**Description:**  
Setting for coefficient K2 to calculate the characteristic (p4662).

**Dependency:**  
Refer to: p4662, p4663, p4664, p4666
### Encoder characteristic K3 / Enc char K3

**p4666[0...n]**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Can be changed: U, T</td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td>Calculated: -</td>
</tr>
<tr>
<td>P-Group: -</td>
<td>Dynamic index: EDS, p0140</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Units group: -</td>
</tr>
<tr>
<td>Min</td>
<td>Access level: 4</td>
</tr>
<tr>
<td>Max</td>
<td>Factory setting</td>
</tr>
</tbody>
</table>

**Dependency:**
Refer to: p4662, p4663, p4664, p4665

**Description:**
Setting for coefficient K3 to calculate the characteristic (p4662).

**Notice:**
Re bit 06:
Setting the bit sets the velocity actual value (r0061) permanently to 0.
Re bit 13:
Setting the bit sets the commutation angle permanently to the commutation angle offset (p0431).

**Note:**
Re bit 09:
A setting of bit = 0 will trigger a fault for the relevant channel if the actual value is invalid.
A setting of bit = 1 will trigger an alarm for the relevant channel if the actual value is invalid.
Re bit 10, 11:
If both channels are activated, the actual value is generated from the mean value of both channels. If a channel fails (actual value invalid), it is not included when the mean value is generated.

### Analog sensor configuration / Ana_sens config

**p4670[0...n]**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Can be changed: U, T</td>
</tr>
<tr>
<td>Data type: Unsigned32</td>
<td>Calculated: -</td>
</tr>
<tr>
<td>P-Group: -</td>
<td>Dynamic index: EDS, p0140</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Units group: -</td>
</tr>
<tr>
<td>Min</td>
<td>Access level: 4</td>
</tr>
<tr>
<td>Max</td>
<td>Factory setting</td>
</tr>
</tbody>
</table>

**Dependency:**

<table>
<thead>
<tr>
<th>Bit field</th>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>06</td>
<td>Set velocity to 0</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>08</td>
<td>Pos val range</td>
<td>0.0 / 1.0 pulse</td>
<td>-0.5 / +0.5 pulse</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>09</td>
<td>Fault/alarm messages</td>
<td>Alarm</td>
<td>Fault</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Chann B act</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Chann A act</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Commutation angle constant</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

**Notice:**
Re bit 06:
Setting the bit sets the velocity actual value (r0061) permanently to 0.
Re bit 13:
Setting the bit sets the commutation angle permanently to the commutation angle offset (p0431).

**Note:**
Re bit 09:
A setting of bit = 0 will trigger a fault for the relevant channel if the actual value is invalid.
A setting of bit = 1 will trigger an alarm for the relevant channel if the actual value is invalid.
Re bit 10, 11:
If both channels are activated, the actual value is generated from the mean value of both channels. If a channel fails (actual value invalid), it is not included when the mean value is generated.

### Analog sensor input / Ana_sens inp

**p4671[0...n]**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Can be changed: C2(4)</td>
</tr>
<tr>
<td>Data type: Integer16</td>
<td>Calculated: -</td>
</tr>
<tr>
<td>P-Group: Encoder</td>
<td>Dynamic index: EDS, p0140</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Units group: -</td>
</tr>
<tr>
<td>Min</td>
<td>Access level: 4</td>
</tr>
<tr>
<td>Max</td>
<td>Factory setting</td>
</tr>
</tbody>
</table>

**Dependency:**

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0: Differential</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>1: Single-ended A, B</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>2: Single-ended A*, B*</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>3: Single-ended A, B sensitive</td>
<td>p4671 = 0;</td>
</tr>
</tbody>
</table>

**Value:**
The two signals on a track are evaluated differentially.
p4671 = 1;
Only the non-inverted signal on a track is evaluated.
p4671 = 2:
Only the inverted signal on a track is evaluated.

p4671 = 3:
Only the non-inverted signal on a track (high resolution) is evaluated.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Factory Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p4672[0...n]</td>
<td>Analog sensor channel A voltage at actual value zero / Ana_sens A U at 0</td>
<td>-10.0000 [V]</td>
<td>10.0000 [V]</td>
<td>0.0000 [V]</td>
</tr>
<tr>
<td>p4673[0...n]</td>
<td>Analog sensor channel A voltage per encoder period / Ana_sens A U/per</td>
<td>-10.0000 [V]</td>
<td>10.0000 [V]</td>
<td>6.0000 [V]</td>
</tr>
<tr>
<td>p4674[0...n]</td>
<td>Analog sensor channel B voltage at actual value zero / Ana_sens B U at 0</td>
<td>-10.0000 [V]</td>
<td>10.0000 [V]</td>
<td>0.0000 [V]</td>
</tr>
<tr>
<td>p4675[0...n]</td>
<td>Analog sensor channel B voltage per encoder period / Ana_sens B U/per</td>
<td>-10.0000 [V]</td>
<td>10.0000 [V]</td>
<td>6.0000 [V]</td>
</tr>
</tbody>
</table>
p4676[0...n] Analog sensor range limit threshold / Ana_sens lim thr
SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Can be changed: U, T
Data type: FloatingPoint32
P-Group: -
Not for motor type: -
Min
0.0 [%] 100.0 [%]

Description: Sets the threshold for limit monitoring of the absolute actual value on the analog sensor. If this threshold is overshot by the actual value of a channel, a corresponding fault/alarm (p4670.9) is output.

Dependency: Refer to: p4673, p4675

p4677[0...n] Analog sensor LVDT configuration / Ana_sens LVDT conf
SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Can be changed: C2(4)
Data type: Unsigned32
P-Group: Encoder
Not for motor type: -
Min
0000 bin

Description: Sets the configuration for LVDT mode on the analog sensor.

Bit field: Bit Signal name 1 signal 0 signal FP
00 LVDT ON Yes No -
01 Track B excitation Yes No -
02 Fixed value amplitude Yes No -
03 Fixed value amplitude and phase Yes No -

p4678[0...n] Analog sensor LVDT ratio / An_sens LVDT ratio
SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Can be changed: C2(4)
Data type: FloatingPoint32
P-Group: Encoder
Not for motor type: -
Min
0.00 [%] 200.00 [%] 50.00 [%]

Description: Sets the ratio for the LVDT sensor.

p4679[0...n] Analog sensor LVDT phase / An_sens LVDT ph
SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Can be changed: C2(4), T
Data type: FloatingPoint32
P-Group: Encoder
Not for motor type: -
Min
-360.00 [°] 360.00 [°] 0.00 [°]

Description: Sets the phase for the LVDT sensor.

p4680[0...n] Zero mark monitoring tolerance permissible / ZM_monit tol perm
SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Can be changed: C2(4)
Data type: Unsigned32
P-Group: Encoder
Not for motor type: -
Min
0 1000 4

Description: Sets the permissible tolerance in encoder pulses for the zero mark distance in the context of zero mark monitoring. Causes fault F3x100 to appear less frequently.
### List of parameters

#### p4681[0...n] Zero mark monitoring, tolerance window limit 1 positive / ZM tol 1 pos

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed: C2(4)</td>
</tr>
<tr>
<td>Data type: Unsigned32</td>
</tr>
<tr>
<td>P-Group: Encoder</td>
</tr>
<tr>
<td>Not for motor type: -</td>
</tr>
<tr>
<td>Description:</td>
</tr>
<tr>
<td>Sets the positive tolerance window in encoder pulses for limit 1 for the zero mark monitoring.</td>
</tr>
<tr>
<td>If the deviation is less than this limit, the PPR is not corrected. If it is higher than this limit, fault F3x131 is triggered.</td>
</tr>
<tr>
<td>If fault F3x131 is re-parameterized to alarm (A) or no message (N), the encoder pulses which have not been corrected are added to the accumulator (p4688). The accumulator can be de-activated using p0437.7.</td>
</tr>
<tr>
<td>Dependency:</td>
</tr>
<tr>
<td>Refer to: p0430, p4688</td>
</tr>
<tr>
<td>Refer to: F31131</td>
</tr>
<tr>
<td>Note:</td>
</tr>
<tr>
<td>This monitoring is activated by setting p0437.2 = 1 (position actual value correction).</td>
</tr>
<tr>
<td>The positive limit describes additional pulses due to EMC.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>p4682[0...n] Zero mark monitoring, tolerance window limit 1 negative / ZM tol 1 neg</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
</tr>
<tr>
<td>Can be changed: C2(4)</td>
</tr>
<tr>
<td>Data type: Integer32</td>
</tr>
<tr>
<td>P-Group: Encoder</td>
</tr>
<tr>
<td>Not for motor type: -</td>
</tr>
<tr>
<td>Description:</td>
</tr>
<tr>
<td>Sets the negative tolerance window in encoder pulses for limit 1 for the zero mark monitoring.</td>
</tr>
<tr>
<td>If the deviation is less than this limit, the PPR is not corrected. If it is higher than this limit, fault F3x131 is triggered.</td>
</tr>
<tr>
<td>If fault F3x131 is re-parameterized to alarm (A) or no message (N), the encoder pulses which have not been corrected are added to the accumulator (p4688). The accumulator can be de-activated using p0437.7.</td>
</tr>
<tr>
<td>Dependency:</td>
</tr>
<tr>
<td>Refer to: p0437, p4681, p4688</td>
</tr>
<tr>
<td>Refer to: F31131</td>
</tr>
<tr>
<td>Note:</td>
</tr>
<tr>
<td>This monitoring is activated by setting p0437.2 = 1 (position actual value correction).</td>
</tr>
<tr>
<td>For a set value = -1001, the negated value of p4681 is effective.</td>
</tr>
<tr>
<td>The negative limit describes the pulses lost due to a covered glass panel in the incremental encoder.</td>
</tr>
</tbody>
</table>

#### p4683[0...n] Zero mark monitoring tolerance window alarm threshold positive / ZM tol A_thr pos

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed: C2(4)</td>
</tr>
<tr>
<td>Data type: Unsigned32</td>
</tr>
<tr>
<td>P-Group: Encoder</td>
</tr>
<tr>
<td>Not for motor type: -</td>
</tr>
<tr>
<td>Description:</td>
</tr>
<tr>
<td>Sets the positive tolerance window in encoder pulses for limit 2 for the zero mark monitoring.</td>
</tr>
<tr>
<td>If the zero mark deviation is higher than the tolerance set in p4681 and p4682 and fault F3x131 is re-parameterized to alarm (A) or no message (N), the accumulator p4688 is compared with this parameter and, if applicable, alarm A3x422 is output for 5 seconds.</td>
</tr>
<tr>
<td>Dependency:</td>
</tr>
<tr>
<td>Refer to: p0437, p4681, p4682, p4688</td>
</tr>
<tr>
<td>Refer to: F31131, A31422</td>
</tr>
<tr>
<td>Note:</td>
</tr>
<tr>
<td>Zero mark monitoring is activated by setting p0437.2 = 1 (position actual value correction).</td>
</tr>
</tbody>
</table>
**Parameter List**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p4684[0...n]</td>
<td>Zero mark monitoring tolerance window alarm threshold negative / ZM tol A_thr neg</td>
<td>Can be changed: C2(4)</td>
<td>Sets the negative tolerance window in encoder pulses for limit 2 for the zero mark monitoring. If the zero mark deviation is higher than the tolerance set in p4681 and p4682 and fault F3x131 is re-parameterized to alarm (A) or no message (N), the accumulator p4688 is compared with this parameter and, if applicable, alarm A3x422 is output for 5 seconds.</td>
</tr>
</tbody>
</table>

| p4685[0...n] | Speed actual value mean value generation / n_act mean val | Can be changed: C2(4) | Sets the number of current controller clock cycles for mean value generation of the speed actual value. Higher values also mean higher dead times for the speed actual value. | Value = 0, 1: No mean value generation. |

| p4686[0...n] | Zero mark minimum length / ZM min length | Can be changed: C2(4) | Sets the minimum length for the zero mark. | Refer to: p0425, p0437, p0437.1 = 1 (zero mark edge detection). The value for the minimum length of the zero mark must be set less than p0425. |

| p4688[0...2] | CO: Zero mark monitoring, differential pulse count / ZM diff_pulse qty | Can be changed: T | Displays the number of differential pulses for the zero mark monitoring that have accumulated. If fault F3x131 is re-parameterized to alarm (A) or no message (N), the encoder pulses which have not been corrected are added to the accumulator (p4688). | Index: [0] = Encoder 1, [1] = Encoder 2, [2] = Reserved |
**Dependency:**
Refer to: p4681, p4682, p4683, p4684

**Note:**
The display can only be reset to zero.

### r4689[0...2]

**CO: Squarewave encoder, diagnostics / Sq-wave enc diag**

**SERVO_S110-CAN,**
**SERVO_S110-DP,**
**SERVO_S110-PN**

**Can be changed:** -  
**Calculated:** -  
**Access level:** 4  

**Data type:** Unsigned32  
**Dynamic index:** -  
**Func. diagram:** -  

**P-Group:** Encoder  
**Units group:** -  
**Unit selection:** -  

**Not for motor type:** -  
**Scaling:** -  
**Expert list:** 1

**Min**  
**Max**  
**Factory setting**  

**Description:**
Displays the encoder status according to PROFIdrive for a squarewave encoder.

**Index:**
[0] = Encoder 1  
[1] = Encoder 2  
[2] = Reserved

**Dependency:**
Refer to: A31422

**Note:**
After alarm A3x422 is output, this parameter is set for 100 ms.

### p4690

**SMI spare part component number / SMI comp_no**

**CU_S110-CAN,**
**CU_S110-DP,**
**CU_S110-PN**

**Can be changed:** T  
**Calculated:** -  
**Access level:** 1  

**Data type:** Unsigned16  
**Dynamic index:** -  
**Func. diagram:** -  

**P-Group:** Displays, signals  
**Units group:** -  
**Unit selection:** -  

**Not for motor type:** -  
**Scaling:** -  
**Expert list:** 1

**Min**  
**Max**  
**Factory setting**

**Description:**
Sets the component number for the SMI/DQI for which motor and/or encoder data should be saved, deleted or downloaded.

**Dependency:**
Refer to: p4691, p4692, p4693

**Note:**
DQI: DRIVE-CLiQ Sensor Integrated  
SMI: SINAMICS Sensor Module Integrated

### p4691

**SMI spare part save/download data / Save/DL SMI data**

**CU_S110-CAN,**
**CU_S110-DP,**
**CU_S110-PN**

**Can be changed:** T  
**Calculated:** -  
**Access level:** 1  

**Data type:** Integer16  
**Dynamic index:** -  
**Func. diagram:** -  

**P-Group:** Displays, signals  
**Units group:** -  
**Unit selection:** -  

**Not for motor type:** -  
**Scaling:** -  
**Expert list:** 1

**Min**  
**Max**  
**Factory setting**

**Description:**
Setting to save/download the data for the Sensor Module Integrated (SMI) specified in p4690.

**Procedure:**
p4690 = set component number  
p4691 = 1, 2, 3, 30 set the required procedure (save/download/delete)  
p4691 = 9, 10, 36 automatic on successful completion of the procedure  
p4691 = 11... 22, 37, 38 --&gt; error values if the procedure could not be executed

**Value:**
0: Inactive  
1: Save SMI data  
2: Download SMI data  
3: Download SMI data from memory card  
9: SMI data downloaded and POWER ON required for component  
10: SMI data backup complete  
11: SMI data backup for selected component not found  
12: Selected component not available or not connected  
13: Insufficient memory space for backup  
14: Format of saved data is incompatible  
15: Transfer fault during data download  
16: Transfer fault during data backup
17: Data backup does not match parameterized encoder/motor
18: Data backup directory not permissible
19: Component already contains data
20: Component does not contain any data
21: Component is not an SMI or a DQI
22: SMI data cannot be downloaded for component
30: Delete SMI data
35: Confirmation of SMI data delete required
36: SMI data deleted and POWER ON required for component
37: Access level not sufficient for delete
38: Delete SMI data not permitted for component

Dependency: Refer to: p4690, p4692, p4693
Notice: Once SMI/DQI data has been deleted or downloaded successfully, the component has to be powered up.
Note: SMI: SINAMICS Sensor Module Integrated
DLQ encoder: DRIVE-CLiQ encoder

Help for error value = 11:
- Save the data for the original SMI on the memory card.
- Use an SMI with a suitable hardware version.
Help for error value = 12:
- Set the correct component number or connect the component.
Help for error value = 15:
- Check the DRIVE-CLiQ wiring for the component.
Help for error value = 16:
- Check the DRIVE-CLiQ wiring for the component.
Help for error value = 17:
- Save the data for the original SMI on the memory card.
Help for error value = 18:
- Set parameter p4693 to an appropriate value.
Help for error value = 19:
- Perform an SMI delete or use a blank SMI.
Help for error value = 20:
- Use an SMI card that is not blank.
Help for error value = 21:
- Set the correct component number (p4690).
Note for error value = 22:
- Data cannot be downloaded for component.
Help for error value = 35:
- Reset parameter p4691 to 30.
Help for error value = 37:
- Set the access level to Expert or higher.
Help for error value = 38:
- Set the correct component number (p4690 >= 200).

p4692 SMI spare part save data of all SMIs / Save SMI data

Can be changed: T
Data type: Integer16
P-Group: Displays, signals
Not for motor type: -
Min
Max
0
29
Access level: 1
Dynamic index: -
Units group: -
Scaling: -
Expert list: 1
Factory setting
0

Description: Setting to back up the data of all SMIs and DQIs featured in the target topology.
Value:
0: Inactive
1: Save data of all SMIs and DQIs
10: Save all data successful
13: Insufficient memory space for backup
### List of parameters

16: Transfer fault during data backup  
20: Component does not contain any data  
29: Not all components from target topology saved

**Note:**  
SMI: SINAMICS Sensor Module Integrated  
p4692 = 10: Automatic on successful completion of backup procedure.  
p4692 = 13, 16, 20, 29: Error values if the procedure could not be executed successfully.  
The procedure must be repeated if the data save operation was interrupted (e.g. if the power supply voltage failed).  
Help for error value = 13:  
- Use a memory card with more memory space.  
Help for error value = 16:  
- Check the DRIVE-CLiQ connection.  
Help for error value = 20:  
- Use an SMI card that is not blank.  
Help for error value = 29:  
- Check and correct the target and actual topologies for the SMIs.  
- Repeat the save procedure.

<table>
<thead>
<tr>
<th>p4693[0...1]</th>
<th>SMI spare part data backup directory/storage location / SMI bkup dir/loc</th>
</tr>
</thead>
</table>
| **CU_S110-CAN, CU_S110-DP, CU_S110-PN** | Can be changed: T  
Data type: Unsigned16  
P-Group: Displays, signals  
Not for motor type: -  
Min | Calculated: -  
Dynamic index: -  
Units group: -  
Scaling: -  
Max  
Factory setting |
| **[0]** = Subdirectory selection  
**[1]** = Memory location |
| **Dependancy:** | Refer to: p4691, r4694 |
| **Notice:** | If p4693[0] is not equal to 0 and p4693[0] is not equal to p4690, the following applies:  
- Only a number >= 200 may be selected for the subdirectory when saving.  
- In the case of downloads, a selection for the subdirectory may only be made for an SMI/DQI with a component number >= 200 (preliminary component number) (p4690 >= 200). |
| **Note:** | SMI: SINAMICS Sensor Module Integrated |
| **Re index 0:** | This index is used to select the subdirectory for saving and downloading data; in the event of access to r4694 the motor order number (MLFB) of the corresponding data backup is displayed. |
| **Re index 1:** | This index is used to set the memory location for the subdirectory for downloading data and the display of the motor order number (MLFB). |
| 0: Non-volatile device memory | 1: Memory card (optional) |

<table>
<thead>
<tr>
<th>r4694[0...19]</th>
<th>SMI spare part data backup motor order number / SMI dat_bkup MLFB</th>
</tr>
</thead>
</table>
| **CU_S110-CAN, CU_S110-DP, CU_S110-PN** | Can be changed: -  
Data type: Unsigned8  
P-Group: Displays, signals  
Not for motor type: -  
Min | Calculated: -  
Dynamic index: -  
Units group: -  
Scaling: - |
| **Max** | **Factory setting** |
| **Dependency:** | Refer to: p4691, p4692 |

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SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3  
1-449
If the selected subdirectory contains a number of data sets, "More Datasets" is displayed in r4694[0...19]. If there is no SMI data (motor/encoder data) in the selected subdirectory or if the selected subdirectory does not exist, the following applies:
- The number of the next subdirectory located is displayed.
- This subdirectory is not checked for valid SMI data.
- If another subdirectory cannot be located, nothing is displayed in r4694[0...19].

**Note:**
SMI: SINAMICS Sensor Module Integrated

### p4700[0...1] Trace control / Trace control

<table>
<thead>
<tr>
<th>CU_S110-CAN,</th>
<th>CU_S110-DP,</th>
<th>CU_S110-PN</th>
</tr>
</thead>
</table>

**Can be changed:** U, T  
**Data type:** Integer16  
**P-Group:** Trace and function generator  
**Not for motor type:** -  
**Min**  
| 0 |

**Value:**  
0: Stop trace  
1: Start trace  

**Index:**  
[0] = Trace 0  
[1] = Trace 1

**Description:** Setting to control the trace function.

**Value:**  
0: Stop measuring function  
1: Start measuring function  
2: Measuring function, check parameterization  
3: Start measuring function without enable signals

### p4701 Measuring function, control / Meas fct ctrl

<table>
<thead>
<tr>
<th>CU_S110-CAN,</th>
<th>CU_S110-DP,</th>
<th>CU_S110-PN</th>
</tr>
</thead>
</table>

**Can be changed:** U, T  
**Data type:** Integer16  
**P-Group:** Trace and function generator  
**Not for motor type:** -  
**Min**  
| 0 |

**Value:**  
0: Stop trace  
1: Start trace  
2: Measuring function, check parameterization  
3: Start measuring function without enable signals

### r4705[0...1] Trace status / Trace status

<table>
<thead>
<tr>
<th>CU_S110-CAN,</th>
<th>CU_S110-DP,</th>
<th>CU_S110-PN</th>
</tr>
</thead>
</table>

**Can be changed:** -  
**Data type:** Integer16  
**P-Group:** Trace and function generator  
**Not for motor type:** -  
**Min**  
| 0 |

**Value:**  
0: Trace inactive  
1: Trace is recording presamples  
2: Trace is waiting for trigger event  
3: Trace is recording  
4: Recording (trace) ended

**Index:**  
[0] = Trace 0  
[1] = Trace 1
### r4706 Measuring function, status / Meas fct status

**CU_S110-CAN, CU_S110-DP, CU_S110-PN**

**Can be changed:** -  
**Data type:** Integer16  
**P-Group:** Trace and function generator  
**Not for motor type:** -  
**Min**  
**Max**  

**Description:** Displays the actual status of the measuring function.
**Value:**  
0: Measurement function inactive  
1: Measuring function, parameterization checked  
2: Measuring function waits for stabilizing time  
3: Measuring function recording (tracing)  
4: Measuring function, trace ended with error  
5: Measuring function, trace successfully completed

**Value:**  
0: Measurement function inactive  
1: Measuring function, parameterization checked  
2: Measuring function waits for stabilizing time  
3: Measuring function recording (tracing)  
4: Measuring function, trace ended with error  
5: Measuring function, trace successfully completed

**Note:** The parameter cannot be changed when the measurement function has been started (r4706 = 2, 3).
**For value = 0:** The system injection point selected to inject the function generator signal is used.
**For value = 1:** No system injection point is used.
When using the measuring function in the STARTER commissioning software, the following applies:
**For value = 0:** A change to a value only becomes effective after first closing and opening the measuring function screen form.
**For value = 1:** The master control does not have to be fetched.
There are two fixed and two freely selectable signals for recording.
**Note:** The parameter cannot be changed when the measurement function has been started (r4706 = 2, 3).
**For value = 0:** The system injection point selected to inject the function generator signal is used.
**For value = 1:** No system injection point is used.
When using the measuring function in the STARTER commissioning software, the following applies:
**For value = 0:** A change to a value only becomes effective after first closing and opening the measuring function screen form.
**For value = 1:** The master control does not have to be fetched.
There are two fixed and two freely selectable signals for recording.

### p4707 Measurement function configuration / Meas fct config

**CU_S110-CAN, CU_S110-DP, CU_S110-PN**

**Can be changed:** U, T  
**Data type:** Integer16  
**P-Group:** -  
**Not for motor type:** -  
**Min**  
**Max**  

**Description:** Setting to configure the measurement function.
**Value:**  
0: Standard  
1: Free meas fct

**Note:** The parameter cannot be changed when the measurement function has been started (r4706 = 2, 3).
**For value = 0:** The system injection point selected to inject the function generator signal is used.
**For value = 1:** No system injection point is used.
When using the measuring function in the STARTER commissioning software, the following applies:
**For value = 0:** A change to a value only becomes effective after first closing and opening the measuring function screen form.
**For value = 1:** The master control does not have to be fetched.
There are two fixed and two freely selectable signals for recording.

### r4708[0...1] Trace memory space required / Trace mem required

**CU_S110-CAN, CU_S110-DP, CU_S110-PN**

**Can be changed:** -  
**Data type:** Unsigned32  
**P-Group:** Trace and function generator  
**Not for motor type:** -  
**Min**  
**Max**  

**Description:** Displays the required memory in bytes for the actual parameterization.
**Index:**  
[0] = Trace 0  
[1] = Trace 1

**Dependency:** Refer to: r4799
### Parameter List of parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Index</th>
<th>Dependency</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>r4709[0...1]</strong></td>
<td>Trace memory space required for measuring functions / Trace mem required</td>
<td>Can be changed: -</td>
<td>Refer to: r4799</td>
</tr>
<tr>
<td>CU_S110-CAN, CU_S110-DP, CU_S110-PN</td>
<td>Displays the memory space required for the current parameter setting in bytes, if the trace is used for the measuring functions.</td>
<td>[0] = Trace 0</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>[1] = Trace 1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>p4710[0...1]</strong></td>
<td>Trace trigger condition / Trace Trig_cond</td>
<td>Can be changed: U, T</td>
<td></td>
</tr>
<tr>
<td>CU_S110-CAN, CU_S110-DP, CU_S110-PN</td>
<td>Sets the trigger condition for the trace.</td>
<td>[0] = Trace 0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Value:</td>
<td>[1] = Trace 1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1: Immediate start</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2: Positive edge</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3: Negative edge</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4: Entry to hysteresis band</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5: Leaving hysteresis band</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6: Trigger at bit mask</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>7: Start with function generator</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>p4711[0...5]</strong></td>
<td>Trace trigger signal / Trace trig_signal</td>
<td>Can be changed: U, T</td>
<td></td>
</tr>
<tr>
<td>CU_S110-CAN, CU_S110-DP, CU_S110-PN</td>
<td>Selects the trigger signal for the trace.</td>
<td>[0] = Trace 0 parameter in BICO format</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>[1] = Trace 1 parameter in BICO format</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>[2] = Trace 0 PINx with DO Id and chart Id</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>[3] = Trace 0 PINx with block Id and PIN Id</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>[4] = Trace 1 PINy with DO Id and chart Id</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>[5] = Trace 1 PINy with block Id and PIN Id</td>
<td></td>
</tr>
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<td></td>
<td></td>
</tr>
</tbody>
</table>
### List of parameters

**Re index 2 ...3:**
The triggering PIN for trace 0 is entered here.

Index 2 bit 31 ... 16: Number of the Drive Object (DO), bit 15 ... 0: Number of the chart
Index 3 bit 31 ... 16: Number of the block, bit 15 ... 0: Number of the PIN

**Re index 4 ... 5:**
The triggering PIN for trace 1 is entered here.

Index 4 bit 31 ... 16: Number of the Drive Object (DO), bit 15 ... 0: Number of the chart
Index 5 bit 31 ... 16: Number of the block, bit 15 ... 0: Number of the PIN

---

<table>
<thead>
<tr>
<th>Parameter Key</th>
<th>Description</th>
<th>Index</th>
<th>Dependency</th>
<th>Can be changed</th>
<th>Data type</th>
<th>P-Group</th>
<th>Not for motor type</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
<th>Factory setting</th>
<th>Expert list</th>
<th>Units group</th>
<th>SCU_S110-CAN, SCU_S110-DP, SCU_S110-PN</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>p4712[0...1]</strong></td>
<td>Trace trigger threshold / Trace trig_thresh</td>
<td></td>
<td></td>
<td>Can be changed: U, T</td>
<td>Calculated: -</td>
<td>Dynamic index: -</td>
<td>Units group: -</td>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td>Factory setting</td>
<td>Expert list: 0</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Description:**
Sets the trigger threshold for the trace.

**Index:**

- [0] = Trace 0
- [1] = Trace 1

**Dependency:**
Only effective when p4710 = 2, 3.

<table>
<thead>
<tr>
<th>Parameter Key</th>
<th>Description</th>
<th>Index</th>
<th>Dependency</th>
<th>Can be changed: U, T</th>
<th>Data type</th>
<th>P-Group</th>
<th>Not for motor type</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
<th>Factory setting</th>
<th>Expert list</th>
<th>Units group</th>
<th>SCU_S110-CAN, SCU_S110-DP, SCU_S110-PN</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>p4713[0...1]</strong></td>
<td>Trace tolerance band trigger threshold / Trace trig thresh</td>
<td></td>
<td></td>
<td>Can be changed: U, T</td>
<td>Calculated: -</td>
<td>Dynamic index: -</td>
<td>Units group: -</td>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td>Factory setting</td>
<td>Expert list: 0</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Description:**
Sets the first trigger threshold for trigger via tolerance band.

**Index:**

- [0] = Trace 0
- [1] = Trace 1

**Dependency:**
Only effective when p4710 = 4, 5.

<table>
<thead>
<tr>
<th>Parameter Key</th>
<th>Description</th>
<th>Index</th>
<th>Dependency</th>
<th>Can be changed: U, T</th>
<th>Data type</th>
<th>P-Group</th>
<th>Not for motor type</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
<th>Factory setting</th>
<th>Expert list</th>
<th>Units group</th>
<th>SCU_S110-CAN, SCU_S110-DP, SCU_S110-PN</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>p4714[0...1]</strong></td>
<td>Trace tolerance band trigger threshold / Trace trig thresh</td>
<td></td>
<td></td>
<td>Can be changed: U, T</td>
<td>Calculated: -</td>
<td>Dynamic index: -</td>
<td>Units group: -</td>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td>Factory setting</td>
<td>Expert list: 0</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Description:**
Sets the second trigger threshold for trigger via tolerance band

**Index:**

- [0] = Trace 0
- [1] = Trace 1

**Dependency:**
Only effective when p4710 = 4, 5.

<table>
<thead>
<tr>
<th>Parameter Key</th>
<th>Description</th>
<th>Index</th>
<th>Can be changed: U, T</th>
<th>Data type</th>
<th>P-Group</th>
<th>Not for motor type</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
<th>Factory setting</th>
<th>Expert list</th>
<th>Units group</th>
<th>SCU_S110-CAN, SCU_S110-DP, SCU_S110-PN</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>p4715[0...1]</strong></td>
<td>Trace bit mask trigger, bit mask / Trace trig mask</td>
<td></td>
<td></td>
<td>Can be changed: U, T</td>
<td>Calculated: -</td>
<td>Dynamic index: -</td>
<td>Units group: -</td>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td>Factory setting</td>
<td>Expert list: 0</td>
<td>-</td>
</tr>
</tbody>
</table>

**Description:**
Sets the bit mask for the bit mask trigger.
### Parameter List of parameters

#### p4716[0...1] Trace, bit mask trigger, trigger condition / Trace Trig_cond

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Index</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p4716[0]</td>
<td>Sets the trigger condition for bit mask trigger.</td>
<td>[0] = Trace 0</td>
<td>0</td>
<td>4294967295</td>
<td>0</td>
</tr>
<tr>
<td>p4716[1]</td>
<td>Only effective when p4710 = 6.</td>
<td>[1] = Trace 1</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

#### p4717 Measuring function, number of averaging operations / Meas fct avg qty

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Index</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p4717</td>
<td>Sets the number of averaging operations for the measuring function.</td>
<td>[0] = Trace 0</td>
<td>0</td>
<td>255</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[1] = Trace 1</td>
<td>[1] = Trace 1</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

#### p4718 Measuring function, number of stabilizing periods / MeasFct StabPerQty

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Index</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p4718</td>
<td>Sets the number of stabilizing periods for the measuring function.</td>
<td>[0] = Trace 0</td>
<td>0</td>
<td>255</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[1] = Trace 1</td>
<td>[1] = Trace 1</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

#### r4719[0...1] Trace trigger index / Trace Trig_index

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Index</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>r4719[0]</td>
<td>Displays the trigger index in the trace buffer. The trigger event occurred at this point.</td>
<td>[0] = Trace 0</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>r4719[1]</td>
<td>Only valid when p4705 = 4.</td>
<td>[1] = Trace 1</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>
### List of parameters

**Parameter**

**p4720[0...1]** Trace recording cycle / Trace record_cyc

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed:</td>
<td>U, T</td>
<td>Calculated: -</td>
</tr>
<tr>
<td>Data type:</td>
<td>FloatingPoint32</td>
<td>Dynamic index: -</td>
</tr>
<tr>
<td>P-Group:</td>
<td>Trace and function generator</td>
<td>Units group: -</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
<td>Scaling: -</td>
</tr>
<tr>
<td>Min</td>
<td>0.000 [ms]</td>
<td>Max</td>
</tr>
<tr>
<td>Max</td>
<td>60000.000 [ms]</td>
<td>Factory setting</td>
</tr>
<tr>
<td>Index:</td>
<td>[0] = Trace 0</td>
<td>[1] = Trace 1</td>
</tr>
</tbody>
</table>

**Index:**

- Sets the recording cycle for the trace.
- Index: [0] = Trace 0  
  [1] = Trace 1

**p4721[0...1]** Trace recording time / Trace record_time

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed:</td>
<td>U, T</td>
<td>Calculated: -</td>
</tr>
<tr>
<td>Data type:</td>
<td>FloatingPoint32</td>
<td>Dynamic index: -</td>
</tr>
<tr>
<td>P-Group:</td>
<td>Trace and function generator</td>
<td>Units group: -</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
<td>Scaling: -</td>
</tr>
<tr>
<td>Min</td>
<td>0.000 [ms]</td>
<td>Max</td>
</tr>
<tr>
<td>Max</td>
<td>360000.000 [ms]</td>
<td>Factory setting</td>
</tr>
<tr>
<td>Index:</td>
<td>[0] = Trace 0</td>
<td>[1] = Trace 1</td>
</tr>
</tbody>
</table>

**Index:**

- Sets the recording time for the trace.
- Index: [0] = Trace 0  
  [1] = Trace 1

**p4722[0...1]** Trace trigger delay / Trace trig_delay

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed:</td>
<td>U, T</td>
<td>Calculated: -</td>
</tr>
<tr>
<td>Data type:</td>
<td>FloatingPoint32</td>
<td>Dynamic index: -</td>
</tr>
<tr>
<td>P-Group:</td>
<td>Trace and function generator</td>
<td>Units group: -</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
<td>Scaling: -</td>
</tr>
<tr>
<td>Min</td>
<td>-3600000.000 [ms]</td>
<td>Max</td>
</tr>
<tr>
<td>Max</td>
<td>3600000.000 [ms]</td>
<td>Factory setting</td>
</tr>
<tr>
<td>Index:</td>
<td>[0] = Trace 0</td>
<td>[1] = Trace 1</td>
</tr>
</tbody>
</table>

**Index:**

- Sets the trigger delay for the trace.
  - Trigger delay < 0: Pretrigger: Tracing (recording) starts the selected time before the trigger event actually occurs.
  - Trigger delay > 0: Post trigger: Tracing does not start until the set time after the trigger event.

**p4723[0...1]** Time slice cycle for trace / Trace cycle

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed:</td>
<td>U, T</td>
<td>Calculated: -</td>
</tr>
<tr>
<td>Data type:</td>
<td>FloatingPoint32</td>
<td>Dynamic index: -</td>
</tr>
<tr>
<td>P-Group:</td>
<td>Trace and function generator</td>
<td>Units group: -</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
<td>Scaling: -</td>
</tr>
<tr>
<td>Min</td>
<td>0.03125 [ms]</td>
<td>Max</td>
</tr>
<tr>
<td>Max</td>
<td>4.00000 [ms]</td>
<td>Factory setting</td>
</tr>
<tr>
<td>Index:</td>
<td>[0] = Trace 0</td>
<td>[1] = Trace 1</td>
</tr>
</tbody>
</table>

**Index:**

- Sets the time slice cycle in which the trace is called.
### Parameter List of parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>p4724[0...1]</strong></td>
<td>Trace average in the time range / Trace average</td>
</tr>
<tr>
<td><strong>r4725[0...1]</strong></td>
<td>Trace, data type 1 traced / Trace rec type 1</td>
</tr>
<tr>
<td><strong>r4726[0...1]</strong></td>
<td>Trace, data type 2 traced / Trace rec type 2</td>
</tr>
<tr>
<td><strong>r4727[0...1]</strong></td>
<td>Trace, data type 3 traced / Trace rec type 3</td>
</tr>
<tr>
<td><strong>r4728[0...1]</strong></td>
<td>Trace, data type 4 traced / Trace rec type 4</td>
</tr>
</tbody>
</table>

#### p4724[0...1]
- **CU_S110-CAN, CU_S110-DP, CU_S110-PN**
- **Can be changed:** U, T
- **Data type:** Unsigned8
- **P-Group:** Trace and function generator
- **Not for motor type:** -
- **Min:** 0000 bin
- **Max:** 0001 bin
- **Access level:** 3
- **Factory setting:** 0000 bin

#### r4725[0...1]
- **CU_S110-CAN, CU_S110-DP, CU_S110-PN**
- **Can be changed:** -
- **Data type:** Unsigned32
- **P-Group:** Trace and function generator
- **Not for motor type:** -
- **Min:** -
- **Max:** -
- **Access level:** 3
- **Factory setting:** -

#### r4726[0...1]
- **CU_S110-CAN, CU_S110-DP, CU_S110-PN**
- **Can be changed:** -
- **Data type:** Unsigned32
- **P-Group:** Trace and function generator
- **Not for motor type:** -
- **Min:** -
- **Max:** -
- **Access level:** 3
- **Factory setting:** -

#### r4727[0...1]
- **CU_S110-CAN, CU_S110-DP, CU_S110-PN**
- **Can be changed:** -
- **Data type:** Unsigned32
- **P-Group:** Trace and function generator
- **Not for motor type:** -
- **Min:** -
- **Max:** -
- **Access level:** 3
- **Factory setting:** -

#### r4728[0...1]
- **CU_S110-CAN, CU_S110-DP, CU_S110-PN**
- **Can be changed:** -
- **Data type:** Unsigned32
- **P-Group:** Trace and function generator
- **Not for motor type:** -
- **Min:** -
- **Max:** -
- **Access level:** 3
- **Factory setting:** -
### List of parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Index</th>
<th>Dependency</th>
</tr>
</thead>
<tbody>
<tr>
<td>r4729[0...1]</td>
<td>Trace number of recorded values / Trace rec values</td>
<td>Can be changed: - Calculated: - Access level: 3</td>
<td>Only valid when p4705 = 4.</td>
</tr>
<tr>
<td>Data type: Unsigned32 Dynamic index: - Units group: - Unit selection: - Expert list: 0 Factory setting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P-Group: Trace and function generator</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type: - Min Max -</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Displays the number of traced values for each signal.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| p4730[0...5] | Trace record signal 0 / Trace record sig 0 | Can be changed: U, T Calculated: - Access level: 3 | |
| Data type: Unsigned32 Dynamic index: - Units group: - Unit selection: - Expert list: 0 Factory setting |
| P-Group: Trace and function generator |
| Not for motor type: - Min Max - |
| Selects the first signal to be traced. |
| Index: [0] = Trace 0 [1] = Trace 1 [2] = Trace 0 PINx with DO Id and chart Id [3] = Trace 0 PINx with block Id and PIN Id [4] = Trace 1 PINy with DO Id and chart Id [5] = Trace 1 PINy with block Id and PIN Id |

| p4731[0...5] | Trace record signal 1 / Trace record sig 1 | Can be changed: U, T Calculated: - Access level: 3 | |
| Data type: Unsigned32 Dynamic index: - Units group: - Unit selection: - Expert list: 0 Factory setting |
| P-Group: Trace and function generator |
| Not for motor type: - Min Max - |
| Selects the second signal to be traced. |
| Index: [0] = Trace 0 parameter in BICO format [1] = Trace 1 parameter in BICO format [2] = Trace 0 PINx with DO Id and chart Id [3] = Trace 0 PINx with block Id and PIN Id [4] = Trace 1 PINy with DO Id and chart Id [5] = Trace 1 PINy with block Id and PIN Id |

| p4732[0...5] | Trace record signal 2 / Trace record sig 2 | Can be changed: U, T Calculated: - Access level: 3 | |
| Data type: Unsigned32 Dynamic index: - Units group: - Unit selection: - Expert list: 0 Factory setting |
| P-Group: Trace and function generator |
| Not for motor type: - Min Max - |
| Selects the third signal to be traced. |
| Index: [0] = Trace 0 parameter in BICO format [1] = Trace 1 parameter in BICO format [2] = Trace 0 PINx with DO Id and chart Id [3] = Trace 0 PINx with block Id and PIN Id |
### List of parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Index</th>
<th>Data type</th>
<th>P-Group</th>
<th>Units group</th>
<th>Access level</th>
<th>Func. diagram</th>
<th>Expert list</th>
</tr>
</thead>
<tbody>
<tr>
<td>p4733[0...5]</td>
<td>Trace record signal 3 / Trace record sig 3</td>
<td>Selects the fourth signal to be traced.</td>
<td>Can be changed: U, T</td>
<td>P-Group: Trace and function generator</td>
<td>Not for motor type: -</td>
<td>Min</td>
<td>Max</td>
<td>Calculated: -</td>
</tr>
<tr>
<td>p4734[0...5]</td>
<td>Trace record signal 4 / Trace record sig 4</td>
<td>Selects the fifth signal to be traced.</td>
<td>Can be changed: U, T</td>
<td>P-Group: Trace and function generator</td>
<td>Not for motor type: -</td>
<td>Min</td>
<td>Max</td>
<td>Calculated: -</td>
</tr>
<tr>
<td>p4735[0...5]</td>
<td>Trace record signal 5 / Trace record sig 5</td>
<td>Selects the sixth signal to be traced.</td>
<td>Can be changed: U, T</td>
<td>P-Group: Trace and function generator</td>
<td>Not for motor type: -</td>
<td>Min</td>
<td>Max</td>
<td>Calculated: -</td>
</tr>
<tr>
<td>p4736[0...5]</td>
<td>Trace record signal 6 / Trace record sig 6</td>
<td>Selects the seventh signal to be traced.</td>
<td>Can be changed: U, T</td>
<td>P-Group: Trace and function generator</td>
<td>Not for motor type: -</td>
<td>Min</td>
<td>Max</td>
<td>Calculated: -</td>
</tr>
</tbody>
</table>
Index:  
[0] = Trace 0 parameter in BICO format  
[1] = Trace 1 parameter in BICO format  
[2] = Trace 0 PINx with DO Id and chart Id  
[3] = Trace 0 PINx with block Id and PIN Id  
[4] = Trace 1 PINy with DO Id and chart Id  
[5] = Trace 1 PINy with block Id and PIN Id

**p4737[0...5]** Trace record signal 7 / Trace record sig 7  
CU_S110-CAN, CU_S110-DP, CU_S110-PN  
Can be changed: U, T  
Data type: Unsigned32  
P-Group: Trace and function generator  
Not for motor type: -  
Min -  
Max -  
Description: Selects the eighth signal to be traced.

**r4740[0...16383]** Trace 0 trace buffer signal 0 floating point / Trace 0 trace sig0  
CU_S110-CAN, CU_S110-DP, CU_S110-PN  
Can be changed: -  
Data type: FloatingPoint32  
P-Group: Trace and function generator  
Not for motor type: -  
Min -  
Max -  
Description: Displays the trace buffer (record buffer) for trace 0 and signal 0.

**r4741[0...16383]** Trace 0 trace buffer signal 1 floating point / Trace 0 trace sig1  
CU_S110-CAN, CU_S110-DP, CU_S110-PN  
Can be changed: -  
Data type: FloatingPoint32  
P-Group: Trace and function generator  
Not for motor type: -  
Min -  
Max -  
Description: Displays the trace buffer (record buffer) for trace 0 and signal 1.
### r4742[0...16383] Trace 0 trace buffer signal 2 floating point / Trace 0 trace sig2

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed:</td>
<td>-</td>
</tr>
<tr>
<td>Calculated:</td>
<td>-</td>
</tr>
<tr>
<td>Access level:</td>
<td>3</td>
</tr>
<tr>
<td>Data type:</td>
<td>FloatingPoint32</td>
</tr>
<tr>
<td>Dynamic index:</td>
<td>-</td>
</tr>
<tr>
<td>Func. diagram:</td>
<td>-</td>
</tr>
<tr>
<td>P-Group:</td>
<td>Trace and function generator</td>
</tr>
<tr>
<td>Units group:</td>
<td>-</td>
</tr>
<tr>
<td>Unit selection:</td>
<td>-</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
</tr>
<tr>
<td>Scaling:</td>
<td>-</td>
</tr>
<tr>
<td>Expert list:</td>
<td>0</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td>Factory setting:</td>
<td>-</td>
</tr>
</tbody>
</table>

**Description:**
Displays the trace buffer (record buffer) for trace 0 and signal 2.

**Dependency:**
Refer to: r4740, p4795

### r4743[0...16383] Trace 0 trace buffer signal 3 floating point / Trace 0 trace sig3

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed:</td>
<td>-</td>
</tr>
<tr>
<td>Calculated:</td>
<td>-</td>
</tr>
<tr>
<td>Access level:</td>
<td>3</td>
</tr>
<tr>
<td>Data type:</td>
<td>FloatingPoint32</td>
</tr>
<tr>
<td>Dynamic index:</td>
<td>-</td>
</tr>
<tr>
<td>Func. diagram:</td>
<td>-</td>
</tr>
<tr>
<td>P-Group:</td>
<td>Trace and function generator</td>
</tr>
<tr>
<td>Units group:</td>
<td>-</td>
</tr>
<tr>
<td>Unit selection:</td>
<td>-</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
</tr>
<tr>
<td>Scaling:</td>
<td>-</td>
</tr>
<tr>
<td>Expert list:</td>
<td>0</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td>Factory setting:</td>
<td>-</td>
</tr>
</tbody>
</table>

**Description:**
Displays the trace buffer (record buffer) for trace 0 and signal 3.

**Dependency:**
Refer to: r4740, p4795

### r4744[0...16383] Trace 0 trace buffer signal 4 floating point / Trace 0 trace sig4

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed:</td>
<td>-</td>
</tr>
<tr>
<td>Calculated:</td>
<td>-</td>
</tr>
<tr>
<td>Access level:</td>
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**Description:**
Displays the trace buffer (record buffer) for trace 0 and signal 4.

**Dependency:**
Refer to: r4740, p4795

### r4745[0...16383] Trace 0 trace buffer signal 5 floating point / Trace 0 trace sig5

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**Description:**
Displays the trace buffer (record buffer) for trace 0 and signal 5.

**Dependency:**
Refer to: r4740, p4795

### r4746[0...16383] Trace 0 trace buffer signal 6 floating point / Trace 0 trace sig6

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**Description:**
Displays the trace buffer (record buffer) for trace 0 and signal 6.

**Dependency:**
Refer to: r4740, p4795
**List of parameters**

**r4747[0...16383] Trace 0 trace buffer signal 7 floating point / Trace 0 trace sig7**

CU_S110-CAN, CU_S110-DP, CU_S110-PN

- Can be changed: -
- Calculated: -
- Access level: 3
- Data type: FloatingPoint32
- Dynamic index: -
- Func. diagram: -
- P-Group: Trace and function generator
- Units group: -
- Unit selection: -
- Not for motor type: -
- Scaling: -
- Expert list: 0
- Min
- Max
- Factory setting

**Description:** Displays the trace buffer (record buffer) for trace 0 and signal 7.

**Dependency:** Refer to: r4740, p4795

---

**r4750[0...16383] Trace 1 trace buffer signal 0 floating point / Trace 1 trace sig0**

CU_S110-CAN, CU_S110-DP, CU_S110-PN

- Can be changed: -
- Calculated: -
- Access level: 3
- Data type: FloatingPoint32
- Dynamic index: -
- Func. diagram: -
- P-Group: Trace and function generator
- Units group: -
- Unit selection: -
- Not for motor type: -
- Scaling: -
- Expert list: 0
- Min
- Max
- Factory setting

**Description:** Displays the trace buffer (record buffer) for trace 1 and signal 0.

**Dependency:** Refer to: r4740, p4795

---

**r4751[0...16383] Trace 1 trace buffer signal 1 floating point / Trace 1 trace sig1**

CU_S110-CAN, CU_S110-DP, CU_S110-PN

- Can be changed: -
- Calculated: -
- Access level: 3
- Data type: FloatingPoint32
- Dynamic index: -
- Func. diagram: -
- P-Group: Trace and function generator
- Units group: -
- Unit selection: -
- Not for motor type: -
- Scaling: -
- Expert list: 0
- Min
- Max
- Factory setting

**Description:** Displays the trace buffer (record buffer) for trace 1 and signal 1.

**Dependency:** Refer to: r4740, p4795

---

**r4752[0...16383] Trace 1 trace buffer signal 2 floating point / Trace 1 trace sig2**

CU_S110-CAN, CU_S110-DP, CU_S110-PN

- Can be changed: -
- Calculated: -
- Access level: 3
- Data type: FloatingPoint32
- Dynamic index: -
- Func. diagram: -
- P-Group: Trace and function generator
- Units group: -
- Unit selection: -
- Not for motor type: -
- Scaling: -
- Expert list: 0
- Min
- Max
- Factory setting

**Description:** Displays the trace buffer (record buffer) for trace 1 and signal 2.

**Dependency:** Refer to: r4740, p4795

---

**r4753[0...16383] Trace 1 trace buffer signal 3 floating point / Trace 1 trace sig3**

CU_S110-CAN, CU_S110-DP, CU_S110-PN

- Can be changed: -
- Calculated: -
- Access level: 3
- Data type: FloatingPoint32
- Dynamic index: -
- Func. diagram: -
- P-Group: Trace and function generator
- Units group: -
- Unit selection: -
- Not for motor type: -
- Scaling: -
- Expert list: 0
- Min
- Max
- Factory setting

**Description:** Displays the trace buffer (record buffer) for trace 1 and signal 3.

**Dependency:** Refer to: r4740, p4795
### List of parameters

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<tr>
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<th>Dependency</th>
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<td>Refer to: r4740, p4795</td>
</tr>
<tr>
<td>Displays the trace buffer (record buffer) for trace 1 and signal 5.</td>
<td>Refer to: r4740, p4795</td>
</tr>
<tr>
<td>Displays the trace buffer (record buffer) for trace 1 and signal 6.</td>
<td>Refer to: r4740, p4795</td>
</tr>
<tr>
<td>Displays the trace buffer (record buffer) for trace 1 and signal 7.</td>
<td>Refer to: r4740, p4795</td>
</tr>
<tr>
<td>Displays the trace buffer (record buffer) for trace 0 and signal 0 as integer number.</td>
<td>Refer to: r4740, p4795</td>
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#### r4754[0...16383] Trace 1 trace buffer signal 4 floating point / Trace 1 trace sig4

- **CU_S110-CAN, CU_S110-DP, CU_S110-PN**
- **Can be changed:** -
- **Calculated:** -
- **Access level:** 3
- **Data type:** FloatingPoint32
- **Dynamic index:** -
- **Func. diagram:** -
- **P-Group:** Trace and function generator
- **Units group:** -
- **Unit selection:** -
- **Not for motor type:** -
- **Scaling:** -
- **Expert list:** 0
- **Min:** -
- **Max:** -
- **Factory setting:** -

**Description:**
Displays the trace buffer (record buffer) for trace 1 and signal 4.

**Dependency:**
Refer to: r4740, p4795

#### r4755[0...16383] Trace 1 trace buffer signal 5 floating point / Trace 1 trace sig5

- **CU_S110-CAN, CU_S110-DP, CU_S110-PN**
- **Can be changed:** -
- **Calculated:** -
- **Access level:** 3
- **Data type:** FloatingPoint32
- **Dynamic index:** -
- **Func. diagram:** -
- **P-Group:** Trace and function generator
- **Units group:** -
- **Unit selection:** -
- **Not for motor type:** -
- **Scaling:** -
- **Expert list:** 0
- **Min:** -
- **Max:** -
- **Factory setting:** -

**Description:**
Displays the trace buffer (record buffer) for trace 1 and signal 5.

**Dependency:**
Refer to: r4740, p4795

#### r4756[0...16383] Trace 1 trace buffer signal 6 floating point / Trace 1 trace sig6

- **CU_S110-CAN, CU_S110-DP, CU_S110-PN**
- **Can be changed:** -
- **Calculated:** -
- **Access level:** 3
- **Data type:** FloatingPoint32
- **Dynamic index:** -
- **Func. diagram:** -
- **P-Group:** Trace and function generator
- **Units group:** -
- **Unit selection:** -
- **Not for motor type:** -
- **Scaling:** -
- **Expert list:** 0
- **Min:** -
- **Max:** -
- **Factory setting:** -

**Description:**
Displays the trace buffer (record buffer) for trace 1 and signal 6.

**Dependency:**
Refer to: r4740, p4795

#### r4757[0...16383] Trace 1 trace buffer signal 7 floating point / Trace 1 trace sig7

- **CU_S110-CAN, CU_S110-DP, CU_S110-PN**
- **Can be changed:** -
- **Calculated:** -
- **Access level:** 3
- **Data type:** FloatingPoint32
- **Dynamic index:** -
- **Func. diagram:** -
- **P-Group:** Trace and function generator
- **Units group:** -
- **Unit selection:** -
- **Not for motor type:** -
- **Scaling:** -
- **Expert list:** 0
- **Min:** -
- **Max:** -
- **Factory setting:** -

**Description:**
Displays the trace buffer (record buffer) for trace 1 and signal 7.

**Dependency:**
Refer to: r4740, p4795

#### r4760[0...16383] Trace 0 trace buffer signal 0 / Trace 0 trace sig0

- **CU_S110-CAN, CU_S110-DP, CU_S110-PN**
- **Can be changed:** -
- **Calculated:** -
- **Access level:** 3
- **Data type:** Unsigned32
- **Dynamic index:** -
- **Func. diagram:** -
- **P-Group:** Trace and function generator
- **Units group:** -
- **Unit selection:** -
- **Not for motor type:** -
- **Scaling:** -
- **Expert list:** 0
- **Min:** -
- **Max:** -
- **Factory setting:** -

**Description:**
Displays the trace buffer (record buffer) for trace 0 and signal 0 as integer number.
Note: For signals, data type I32 or U32, the trace buffer is assigned as follows:

- \( \text{r4760}[0] = \text{value 0} \)
- \( \text{r4760}[1] = \text{value 1} \)
- ... \( \text{r4760}[8191] = \text{value 8191} \)

For signals, data type I16 or U16, the trace buffer is assigned as follows:

- \( \text{r4760}[0] = \text{value 0 (bit 31 ... 16)} \) and \( \text{value 1 (bit 15 ... 0)} \)
- \( \text{r4760}[1] = \text{value 2 (bit 31 ... 16)} \) and \( \text{value 3 (bit 15 ... 0)} \)
- ... \( \text{r4760}[8191] = \text{value 16382 (bit 31 ... 16)} \) and \( \text{value 16383 (bit 15 ... 0)} \)

For signals, data type I8 or U8, the trace buffer is assigned as follows:

- \( \text{r4760}[0] = \text{value 0 (bit 31 ... 24)} \) \( \text{value 1 (bit 23 ... 16)} \) \( \text{value 2 (bit 15 ... 8)} \) \( \text{value 3 (bit 7 ... 0)} \)
- \( \text{r4760}[1] = \text{value 4 (bit 31 ... 24)} \) \( \text{value 5 (bit 23 ... 16)} \) \( \text{value 6 (bit 15 ... 8)} \) \( \text{value 7 (bit 7 ... 0)} \)
- ... \( \text{r4760}[8191] = \text{value 32764 (bit 31 ... 24)} \) \( \text{value 32765 (bit 23 ... 16)} \) \( \text{value 32766 (bit 15 ... 8)} \) \( \text{value 32767 (bit 7 ... 0)} \)

### r4761[0...16383] Trace 0 trace buffer signal 1 / Trace 0 trace sig1

**CU_S110-CAN, CU_S110-DP, CU_S110-PN**

- Can be changed: -
- Data type: Calculated: -
- Dynamic index: -
- P-Group: -
- Units group: -
- Not for motor type: -
- Scaling: -
- Min: -
- Max: -
- Factory setting: -

**Description:** Displays the trace buffer (record buffer) for trace 0 and signal 1.

**Dependency:** Refer to: r4760

### r4762[0...16383] Trace 0 trace buffer signal 2 / Trace 0 trace sig2

**CU_S110-CAN, CU_S110-DP, CU_S110-PN**

- Can be changed: -
- Data type: Calculated: -
- Dynamic index: -
- P-Group: -
- Units group: -
- Not for motor type: -
- Scaling: -
- Min: -
- Max: -
- Factory setting: -

**Description:** Displays the trace buffer (record buffer) for trace 0 and signal 2.

**Dependency:** Refer to: r4760

### r4763[0...16383] Trace 0 trace buffer signal 3 / Trace 0 trace sig3

**CU_S110-CAN, CU_S110-DP, CU_S110-PN**

- Can be changed: -
- Data type: Calculated: -
- Dynamic index: -
- P-Group: -
- Units group: -
- Not for motor type: -
- Scaling: -
- Min: -
- Max: -
- Factory setting: -

**Description:** Displays the trace buffer (record buffer) for trace 0 and signal 3.

**Dependency:** Refer to: r4760
### Parameter List

#### r4764[0...16383] Trace 0 trace buffer signal 4 / Trace 0 trace sig4

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#### r4765[0...16383] Trace 0 trace buffer signal 5 / Trace 0 trace sig5

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#### r4766[0...16383] Trace 0 trace buffer signal 6 / Trace 0 trace sig6

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#### r4767[0...16383] Trace 0 trace buffer signal 7 / Trace 0 trace sig7

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#### r4770[0...16383] Trace 1 trace buffer signal 0 / Trace 1 trace sig0

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**Dependency:**
- Refer to: r4760

**Not for motor type:**
Yes

**Scaling:**
- No scaling

**Expert list:**
0

**Min Max Factory setting:**
- - -

CU_S110-CAN, CU_S110-DP, CU_S110-PN

**Can be changed:**
- Yes

**Calculated:**
- Yes

**Func. diagram:**
- No function diagram

**Units group:**
- No units group

**Unit selection:**
- No unit selection

**P-Group:**
- Trace and function generator

**Access level:**
- 3

**Data type:**
- Unsigned32

**Dynamic index:**
- No dynamic index

**Func. diagram:**
- No function diagram

**Unit selection:**
- No unit selection

**Expert list:**
- 0

**Min Max Factory setting:**
- - -
## List of parameters

### r4771[0...16383] Trace 1 trace buffer signal 1 / Trace 1 trace sig1

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**Description:**
Displays the trace buffer (record buffer) for trace 1 and signal 1.

### r4772[0...16383] Trace 1 trace buffer signal 2 / Trace 1 trace sig2

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**Description:**
Displays the trace buffer (record buffer) for trace 1 and signal 2.

### r4773[0...16383] Trace 1 trace buffer signal 3 / Trace 1 trace sig3

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**Description:**
Displays the trace buffer (record buffer) for trace 1 and signal 3.

### r4774[0...16383] Trace 1 trace buffer signal 4 / Trace 1 trace sig4

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**Description:**
Displays the trace buffer (record buffer) for trace 1 and signal 4.

### r4775[0...16383] Trace 1 trace buffer signal 5 / Trace 1 trace sig5

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**Description:**
Displays the trace buffer (record buffer) for trace 1 and signal 5.
### r4776[0...16383] Trace 1 trace buffer signal 6 / Trace 1 trace sig6

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### r4777[0...16383] Trace 1 trace buffer signal 7 / Trace 1 trace sig7

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### p4780[0...1] Trace physical address signal 0 / Trace PhyAddr Sig0

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### p4781[0...1] Trace physical address signal 1 / Trace PhyAddr Sig1

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<tr>
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<td>[0] = Trace 0</td>
<td>[0]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Parameter

List of parameters

### p4786[0...1] Trace physical address signal 6 / Trace PhyAddr Sig6

**CU_S110-CAN, CU_S110-DP, CU_S110-PN**

- **Can be changed:** U, T
- **Data type:** Unsigned32
- **P-Group:** Trace and function generator
- **Min:** 0000 bin
- **Max:** 1111 1111 1111 1111 1111 1111 1111 1111 bin

**Description:**
Sets the physical address for the seventh signal to be traced.
The data type is defined using p4736.

**Index:**
- [0] = Trace 0
- [1] = Trace 1

- **Access level:** 3
- **Dynamic index:** -
- **Func. diagram:** -
- **Units group:** -
- **Unit selection:** -
- **Scaling:** -
- **Expert list:** 0
- **Factory setting:** 0000 bin

### p4787[0...1] Trace physical address signal 7 / Trace PhyAddr Sig7

**CU_S110-CAN, CU_S110-DP, CU_S110-PN**

- **Can be changed:** U, T
- **Data type:** Unsigned32
- **P-Group:** Trace and function generator
- **Min:** 0000 bin
- **Max:** 1111 1111 1111 1111 1111 1111 1111 1111 bin

**Description:**
Sets the physical address for the eighth signal to be traced.
The data type is defined using p4737.

**Index:**
- [0] = Trace 0
- [1] = Trace 1

- **Access level:** 3
- **Dynamic index:** -
- **Func. diagram:** -
- **Units group:** -
- **Unit selection:** -
- **Scaling:** -
- **Expert list:** 0
- **Factory setting:** 0000 bin

### p4789[0...1] Trace physical address trigger signal / Trace PhyAddr Trig

**CU_S110-CAN, CU_S110-DP, CU_S110-PN**

- **Can be changed:** U, T
- **Data type:** Unsigned32
- **P-Group:** Trace and function generator
- **Min:** 0000 hex
- **Max:** FFFF FFFF hex

**Description:**
Sets the physical address for the trigger signal.
The data type is defined by making the appropriate selection in p4711.

**Index:**
- [0] = Trace 0
- [1] = Trace 1

- **Access level:** 3
- **Dynamic index:** -
- **Func. diagram:** -
- **Units group:** -
- **Unit selection:** -
- **Scaling:** -
- **Expert list:** 0
- **Factory setting:** 0000 hex

### r4790[0...1] Trace, data type 5 traced / Trace rec type 5

**CU_S110-CAN, CU_S110-DP, CU_S110-PN**

- **Can be changed:** -
- **Data type:** Unsigned32
- **P-Group:** Trace and function generator
- **Min:** -
- **Max:** -

**Description:**
Sets the physical address for the trigger signal.
The data type is defined by making the appropriate selection in p4711.

**Index:**
- [0] = Trace 0
- [1] = Trace 1

- **Access level:** 3
- **Dynamic index:** -
- **Func. diagram:** -
- **Units group:** -
- **Unit selection:** -
- **Scaling:** -
- **Expert list:** 0
- **Factory setting:** -
### List of parameters

#### r4791[0...1]
**Trace, data type 6 traced / Trace rec type 6**
- **CU_S110-CAN, CU_S110-DP, CU_S110-PN**
- Can be changed: -
- Calculated: -
- Access level: 3
- Data type: Unsigned32
- Dynamic index: -
- Func. diagram: -
- P-Group: Trace and function generator
- Units group: -
- Unit selection: -
- Not for motor type: -
- Scaling: -
- Expert list: 0
- Min
- Max
- Factory setting
- Index:
  - [0] = Trace 0
  - [1] = Trace 1

#### r4792[0...1]
**Trace, data type 7 traced / Trace rec type 7**
- **CU_S110-CAN, CU_S110-DP, CU_S110-PN**
- Can be changed: -
- Calculated: -
- Access level: 3
- Data type: Unsigned32
- Dynamic index: -
- Func. diagram: -
- P-Group: Trace and function generator
- Units group: -
- Unit selection: -
- Not for motor type: -
- Scaling: -
- Expert list: 0
- Min
- Max
- Factory setting
- Index:
  - [0] = Trace 0
  - [1] = Trace 1

#### r4793[0...1]
**Trace, data type 8 traced / Trace rec type 8**
- **CU_S110-CAN, CU_S110-DP, CU_S110-PN**
- Can be changed: -
- Calculated: -
- Access level: 3
- Data type: Unsigned32
- Dynamic index: -
- Func. diagram: -
- P-Group: Trace and function generator
- Units group: -
- Unit selection: -
- Not for motor type: -
- Scaling: -
- Expert list: 0
- Min
- Max
- Factory setting
- Index:
  - [0] = Trace 0
  - [1] = Trace 1

#### p4795
**Trace memory bank changeover / Trace mem changeov**
- **CU_S110-CAN, CU_S110-DP, CU_S110-PN**
- Can be changed: U, T
- Calculated: -
- Access level: 3
- Data type: Unsigned32
- Dynamic index: -
- Func. diagram: -
- P-Group: Trace and function generator
- Units group: -
- Unit selection: -
- Not for motor type: -
- Scaling: -
- Expert list: 0
- Min
- Max
- Factory setting
- 0
- 500
- 0

**Description:** Changes over the memory bank to read out the contents of the trace buffer.

**Dependency:** Refer to: r4740, r4741, r4742, r4743, r4750, r4751, r4752, r4753

#### r4799
**Trace memory location free / Trace mem free**
- **CU_S110-CAN, CU_S110-DP, CU_S110-PN**
- Can be changed: -
- Calculated: -
- Access level: 3
- Data type: Unsigned32
- Dynamic index: -
- Func. diagram: -
- P-Group: Trace and function generator
- Units group: -
- Unit selection: -
- Not for motor type: -
- Scaling: -
- Expert list: 0
- Min
- Max
- Factory setting
- -

**Description:** Displays the free memory for the trace in bytes.

**Dependency:** Refer to: r4708
### p4800 Function generator control / FG control

**CU_S110-CAN, CU_S110-DP, CU_S110-PN**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Dependency</th>
</tr>
</thead>
<tbody>
<tr>
<td>p4800</td>
<td>Can be changed: U, T</td>
<td>Calculated: -</td>
<td>Access level: 3</td>
</tr>
<tr>
<td></td>
<td>Data type: Integer16</td>
<td>Dynamic index: -</td>
<td>Func. diagram: -</td>
</tr>
<tr>
<td></td>
<td>P-Group: Trace and function generator</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 0</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Value:**
- 0: Stop function generator
- 1: Start function generator
- 2: Check function generator parameterization
- 3: Start function generator without enable signals

**Dependency:**
Refer to: p4819

**Description:**
The function generator is started with p4800 = 1. The signal is only generated for a 1 signal of binector input p4819.

### r4805 Function generator status / FG status

**CU_S110-CAN, CU_S110-DP, CU_S110-PN**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Dependency</th>
</tr>
</thead>
<tbody>
<tr>
<td>r4805</td>
<td>Can be changed: -</td>
<td>Calculated: -</td>
<td>Access level: 3</td>
</tr>
<tr>
<td></td>
<td>Data type: Integer16</td>
<td>Dynamic index: -</td>
<td>Func. diagram: -</td>
</tr>
<tr>
<td></td>
<td>P-Group: Trace and function generator</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 0</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Value:**
- 0: Inactive
- 1: Generate accelerating ramp to offset
- 2: Generate parameterized signal shape
- 3: Generate braking ramp
- 4: Function generator stopped due to missing enable signals
- 5: Function generator waits for BI: p4819
- 6: Function generator parameterization has been checked

**Dependency:**
Refer to: p4800, p4819

**Description:**
Displays the actual status of the function generator.

### r4806.0 BO: Function generator status signal / FG status signal

**CU_S110-CAN, CU_S110-DP, CU_S110-PN**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Dependency</th>
</tr>
</thead>
<tbody>
<tr>
<td>r4806.0</td>
<td>Can be changed: -</td>
<td>Calculated: -</td>
<td>Access level: 3</td>
</tr>
<tr>
<td></td>
<td>Data type: Unsigned32</td>
<td>Dynamic index: -</td>
<td>Func. diagram: -</td>
</tr>
<tr>
<td></td>
<td>P-Group: Trace and function generator</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 0</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:**
Displays the status of the function generator.

0 signal: Function generator inactive
1 signal: Function generator running

**Bit field:**

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Bit 0</td>
<td>ON</td>
<td>OFF</td>
<td></td>
</tr>
</tbody>
</table>

### p4810 Function generator mode / FG operating mode

**CU_S110-CAN, CU_S110-DP, CU_S110-PN**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Dependency</th>
</tr>
</thead>
<tbody>
<tr>
<td>p4810</td>
<td>Can be changed: U, T</td>
<td>Calculated: -</td>
<td>Access level: 3</td>
</tr>
<tr>
<td></td>
<td>Data type: Integer16</td>
<td>Dynamic index: -</td>
<td>Func. diagram: -</td>
</tr>
<tr>
<td></td>
<td>P-Group: Trace and function generator</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 0</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>99</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:**
Sets the operating mode of the function generator.
List of parameters

Parameter

Value:
0: Connection at connector output r4818
1: Connection at current setpoint after filter and r4818
2: Connection as disturbing torque and r4818
3: Connection at speed setpoint after filter and r4818
4: Connection at current setpoint before filter and r4818
5: Connection at speed setpoint before filter and r4818
6: Connection for free measurement function r4818 and r4834
99: Connection at physical address and r4818

Description:
Sets the physical address where the function generator is to be connected.
Dependency:
Only effective when p4810 = 99.

p4812 Function generator physical address / FG phys address

CU_S110-CAN, CU_S110-DP, CU_S110-PN
Can be changed: U, T
Calculated: -
Access level: 3
Data type: Unsigned32
Dynamic index: -
Func. diagram: -
P-Group: Trace and function generator
Units group: -
Unit selection: -
Expert list: 0
Min Max
0 4294967295
Factory setting 0

Description:
Sets the physical address where the function generator is to be connected.
Dependency:
Only effective when p4810 = 99.

p4813 Function generator physical address reference value / FG phys addr ref

CU_S110-CAN, CU_S110-DP, CU_S110-PN
Can be changed: U, T
Calculated: -
Access level: 3
Data type: FloatingPoint32
Dynamic index: -
Func. diagram: -
P-Group: Trace and function generator
Units group: -
Unit selection: -
Expert list: 0
Min Max
1.00 1000000.00
Factory setting 1.00

Description:
Sets the reference value for 100 % for referred inputs.
Dependency:
Only effective when p4810 = 99.

p4815[0...2] Function generator drive number / FG drive number

CU_S110-CAN, CU_S110-DP, CU_S110-PN
Can be changed: U, T
Calculated: -
Access level: 3
Data type: Unsigned16
Dynamic index: -
Func. diagram: -
P-Group: Trace and function generator
Units group: -
Unit selection: -
Expert list: 0
Min Max
0 65535
Factory setting 0

Description:
Selects the required drive where the function generator is to be connected.
Index:
[0] = First drive for connection
[1] = Second drive for connection
[2] = Third drive for connection
Dependency:
Only effective when p4810 = 1, 2, 3, 4 or 5.
Note:
For the function generator, only type SERVO, VECTOR or DC_CTRL type drives can be used.

p4816 Function generator output signal integer number scaling / FG outp integ scal

CU_S110-CAN, CU_S110-DP, CU_S110-PN
Can be changed: U, T
Calculated: -
Access level: 4
Data type: Integer32
Dynamic index: -
Func. diagram: -
P-Group: -
Units group: -
Unit selection: -
Expert list: 1
Min Max
-2147483648 2147483647
Factory setting 0

Description:
Sets the scaling for the integer number of the output signal for the function generator.
Dependency:
Refer to: r4805, r4817
Note:
The parameter can only be changed in the following operating states:
r4805 = 0, 4, 6
### r4817
**CO: Function generator output signal integer number / FG outp integ no.**

**CU_S110-CAN, CU_S110-DP, CU_S110-PN**

- **Can be changed:** -
- **Calculated:** -
- **Access level:** 4
- **Data type:** Integer32
- **Dynamic index:** -
- **Func. diagram:** -
- **Units group:** -
- **Unit selection:** -
- **Not for motor type:** -
- **Scaling:** -
- **Expert list:** 0
- **Min:** -
- **Max:** -

**Description:**
Display and connector output for the integer number of the output signal for the function generator.

**Dependency:**
Refer to: p4816

**Note:**
The value is output independent of the function generator operating mode.

### r4818
**CO: Function generator output signal / FG outp_sig**

**CU_S110-CAN, CU_S110-DP, CU_S110-PN**

- **Can be changed:** -
- **Calculated:** -
- **Access level:** 3
- **Data type:** FloatingPoint32
- **Dynamic index:** -
- **Func. diagram:** -
- **Units group:** -
- **Unit selection:** -
- **Not for motor type:** -
- **Scaling:** PERCENT
- **Expert list:** 0
- **Min:** - [%]
- **Max:** - [%]

**Description:**
Displays the output signal for the function generator.

**Dependency:**
Refer to: p4810

**Note:**
The value is displayed independently of the function generator mode.

### p4819
**BI: Function generator control / FG control**

**CU_S110-CAN, CU_S110-DP, CU_S110-PN**

- **Can be changed:** -
- **Calculated:** -
- **Access level:** 3
- **Data type:** Unsigned32 / Binary
- **Dynamic index:** -
- **Func. diagram:** -
- **Units group:** -
- **Unit selection:** -
- **Not for motor type:** -
- **Scaling:** -
- **Expert list:** 0
- **Min:** -
- **Max:** 1

**Description:**
Sets the signal source to control the function generator.
When the function generator is running, signal generation is stopped with a 0 signal from BI: p4819 and p4800 is set to 0.

**Dependency:**
Refer to: p4800

### p4820
**Function generator signal shape / FG signal shape**

**CU_S110-CAN, CU_S110-DP, CU_S110-PN**

- **Can be changed:** -
- **Calculated:** -
- **Access level:** 3
- **Data type:** Integer16
- **Dynamic index:** -
- **Func. diagram:** -
- **Units group:** -
- **Unit selection:** -
- **Not for motor type:** -
- **Scaling:** -
- **Expert list:** 0
- **Min:** 1
- **Max:** 5

**Description:**
Sets the signal to be generated for the function generator.

**Value:**
1: Square-wave
2: Staircase
3: Delta
4: Binary noise - PRBS (Pseudo Random Binary Signal)
5: Sine-wave
### p4821 Function generator period / FG period duration

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>p4821</td>
<td>Function generator period / FG period duration</td>
<td>Can be changed: U, T  Calculated: -  Access level: 3</td>
</tr>
<tr>
<td>CU_S110-CAN</td>
<td></td>
<td>Data type: FloatingPoint32  Dynamic index: -  Func. diagram: -</td>
</tr>
<tr>
<td>CU_S110-DP</td>
<td></td>
<td>P-Group: Trace and function generator  Units group: -  Unit selection: -</td>
</tr>
<tr>
<td>CU_S110-PN</td>
<td></td>
<td>Not for motor type: -  Scaling: -  Expert list: 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Min</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.00 [ms]</td>
</tr>
</tbody>
</table>

**Dependency:**
Sets the period of the signal to be generated for the function generator.

**Description:**
Ineffective when p4820 = 4 (PRBS).

### p4822 Function generator pulse width / FG pulse width

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>p4822</td>
<td>Function generator pulse width / FG pulse width</td>
<td>Can be changed: U, T  Calculated: -  Access level: 3</td>
</tr>
<tr>
<td>CU_S110-CAN</td>
<td></td>
<td>Data type: FloatingPoint32  Dynamic index: -  Func. diagram: -</td>
</tr>
<tr>
<td>CU_S110-DP</td>
<td></td>
<td>P-Group: Trace and function generator  Units group: -  Unit selection: -</td>
</tr>
<tr>
<td>CU_S110-PN</td>
<td></td>
<td>Not for motor type: -  Scaling: -  Expert list: 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Min</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.00 [ms]</td>
</tr>
</tbody>
</table>

**Dependency:**
Sets the pulse width for the signal to be generated for the function generator.

**Description:**
Only effective when p4820 = 1 (square-wave).

### p4823 Function generator bandwidth / FG bandwidth

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>p4823</td>
<td>Function generator bandwidth / FG bandwidth</td>
<td>Can be changed: U, T  Calculated: -  Access level: 3</td>
</tr>
<tr>
<td>CU_S110-CAN</td>
<td></td>
<td>Data type: FloatingPoint32  Dynamic index: -  Func. diagram: -</td>
</tr>
<tr>
<td>CU_S110-DP</td>
<td></td>
<td>P-Group: Trace and function generator  Units group: -  Unit selection: -</td>
</tr>
<tr>
<td>CU_S110-PN</td>
<td></td>
<td>Not for motor type: -  Scaling: -  Expert list: 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Min</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.0025 [Hz]</td>
</tr>
</tbody>
</table>

**Dependency:**
Sets the bandwidth for the signal to be generated for the function generator.

**Description:**
Only effective when p4820 = 4 (PRBS).

**Reference:**
Refer to: p4830
Refer to: A02041

### p4824 Function generator amplitude / FG amplitude

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>p4824</td>
<td>Function generator amplitude / FG amplitude</td>
<td>Can be changed: U, T  Calculated: -  Access level: 3</td>
</tr>
<tr>
<td>CU_S110-CAN</td>
<td></td>
<td>Data type: FloatingPoint32  Dynamic index: -  Func. diagram: -</td>
</tr>
<tr>
<td>CU_S110-DP</td>
<td></td>
<td>P-Group: Trace and function generator  Units group: -  Unit selection: -</td>
</tr>
<tr>
<td>CU_S110-PN</td>
<td></td>
<td>Not for motor type: -  Scaling: -  Expert list: 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Min</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-1600.00 [%]</td>
</tr>
</tbody>
</table>

**Dependency:**
Sets the amplitude for the signal to be generated for the function generator.

**Description:**
Units are dependent on p4810.

**If p4810 = 1, 2, 4:** The amplitude is referred to p2002 (reference current).
**If p4810 = 3, 5:** The amplitude is referred to p2000 (reference speed).
### p4825 Function generator 2nd amplitude / FG 2nd amplitude

**CU_S110-CAN**, **CU_S110-DP**, **CU_S110-PN**

- **Can be changed:** U, T
- **Data type:** FloatingPoint32
- **P-Group:** Trace and function generator
- **Not for motor type:** -
- **Min:** -1600.00 [%]
- **Max:** 1600.00 [%]

**Description:** Sets the second amplitude for the signal to be generated for the function generator.

**Dependency:** Only effective for p4820 = 2 (staircase).
- Units are dependent on p4810.
  - If p4810 = 1, 2, 4: The amplitude is referred to p2002 (reference current).
  - If p4810 = 3, 5: The amplitude is referred to p2000 (reference speed).

**Access level:** 3

**Expert list:** 0

**Factory setting:** 7.00 [%]

### p4826 Function generator offset / FG offset

**CU_S110-CAN**, **CU_S110-DP**, **CU_S110-PN**

- **Can be changed:** U, T
- **Data type:** FloatingPoint32
- **P-Group:** Trace and function generator
- **Not for motor type:** -
- **Min:** -1600.00 [%]
- **Max:** 1600.00 [%]

**Description:** Sets the offset (DC component) of the signal to be generated for the function generator.

**Dependency:** Units are dependent on p4810.
- If p4810 = 1, 2, 4: The offset is referred to p2002 (reference current).
- If p4810 = 3, 5: The offset is referred to p2000 (reference speed).
- If p4810 = 2: In order to avoid the undesirable effects of play (backlash), the offset does not act on the current setpoint, but instead on the speed setpoint.

**Access level:** 3

**Expert list:** 0

**Factory setting:** 0.00 [%]

### p4827 Function generator ramp-up time to offset / FG ramp-up offset

**CU_S110-CAN**, **CU_S110-DP**, **CU_S110-PN**

- **Can be changed:** U, T
- **Data type:** FloatingPoint32
- **P-Group:** Trace and function generator
- **Not for motor type:** -
- **Min:** 0.00 [ms]
- **Max:** 100000.00 [ms]
- **Factory setting:** 32.00 [ms]

**Description:** Sets the ramp-up time to the offset for the function generator.

**Access level:** 3

**Expert list:** 0

### p4828 Function generator lower limit / FG lower limit

**CU_S110-CAN**, **CU_S110-DP**, **CU_S110-PN**

- **Can be changed:** U, T
- **Data type:** FloatingPoint32
- **P-Group:** Trace and function generator
- **Not for motor type:** -
- **Min:** -10000.00 [%]
- **Max:** 0.00 [%]

**Description:** Sets the lower limit for the function generator.

**Dependency:** For p4810 = 2 the limit only applies to the current setpoint, but not the speed setpoint (offset).
### List of parameters

**p4829**  
**Function generator upper limit / FG upper limit**  
- **CU_S110-CAN, CU_S110-DP, CU_S110-PN**  
- **Can be changed:** U, T  
- **Data type:** FloatingPoint32  
- **P-Group:** Trace and function generator  
- **Min:** 0.00 [%]  
- **Max:** 10000.00 [%]  
- **Factory setting:** 100.00 [%]  
- **Access level:** 3  
- **Dependency:** Sets the upper limit for the function generator.  
- **Description:** For p4810 = 2 the limit only applies to the current setpoint, but not the speed setpoint (offset).

**p4830**  
**Function generator time slice cycle / FG time slice**  
- **CU_S110-CAN, CU_S110-DP, CU_S110-PN**  
- **Can be changed:** U, T  
- **Data type:** FloatingPoint32  
- **P-Group:** Trace and function generator  
- **Min:** 0.03125 [ms]  
- **Max:** 2.00000 [ms]  
- **Factory setting:** 0.12500 [ms]  
- **Access level:** 3  
- **Dependency:** Sets the time slice cycle in which the function generator is called.

**p4831**  
**Function generator amplitude scaling / FG amplitude scal**  
- **CU_S110-CAN, CU_S110-DP, CU_S110-PN**  
- **Can be changed:** U, T  
- **Data type:** FloatingPoint32  
- **P-Group:** Trace and function generator  
- **Min:** 0.00000 [%]  
- **Max:** 200.00000 [%]  
- **Factory setting:** 100.00000 [%]  
- **Access level:** 3  
- **Dependency:** Sets the scaling for the amplitude of the signal waveforms for all output channels.  
- **Description:** The value can be changed while the function generator is running.

**p4832[0...2]**  
**Function generator amplitude scaling / FG amplitude scal**  
- **CU_S110-CAN, CU_S110-DP, CU_S110-PN**  
- **Can be changed:** U, T  
- **Data type:** FloatingPoint32  
- **P-Group:** Trace and function generator  
- **Min:** -340.28235E36 [%]  
- **Max:** 340.28235E36 [%]  
- **Factory setting:** 100.00000 [%]  
- **Access level:** 3  
- **Dependency:** Sets the scaling for the amplitude of the signal waveforms separately for each output channel.  
- **Description:** The value cannot be changed while the function generator is running.

**p4833[0...2]**  
**Function generator offset scaling / FG offset scal**  
- **CU_S110-CAN, CU_S110-DP, CU_S110-PN**  
- **Can be changed:** U, T  
- **Data type:** FloatingPoint32  
- **P-Group:** Trace and function generator  
- **Min:** -340.28235E36 [%]  
- **Max:** 340.28235E36 [%]  
- **Factory setting:** 100.00000 [%]  
- **Access level:** 3  
- **Dependency:** Sets the scaling for the offset of the signal waveforms separately for each output channel.  
- **Description:** The value cannot be changed while the function generator is running.
**Parameter**

**List of parameters**

**r4834[0...4]**  
**CO: Function generator free measurement output signal / FG fr MeasFct outp**  
CU_S110-CAN, CU_S110-DP, CU_S110-PN  
Can be changed: -  
Data type: FloatingPoint32  
P-Group: Trace and function generator  
Not for motor type: -  
Min [-%] Max [-%] Factory setting [-%]  
Description: Displays the output signal for the free measurement function.

**p4835[0...4]**  
**Function generator free measurement function scaling / FG fr MeasFct scal**  
CU_S110-CAN, CU_S110-DP, CU_S110-PN  
Can be changed: U, T  
Data type: FloatingPoint32  
P-Group: -  
Not for motor type: -  
Min -200.00000% Max 200.00000% Factory setting 100.00000%  
Description: Sets the scaling of the output signals for the free measurement function.

**r5005**  
**Spindle file system status / File sys stat**  
SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
Can be changed: -  
Data type: Unsigned32  
P-Group: -  
Min - No  
Description: Displays the status for the file system on the non-volatile memory.

**Bit field:**  
Bit | Signal name | 1 signal | 0 signal | FP  
--- | --- | --- | --- | ---  
01 | Result data clamping cycle thresholds available | Yes | No | -  
02 | Result data clamping cycle counter available | Yes | No | -  
03 | Result data operating hours counter available | Yes | No | -  
04 | Result data temperature diagnostics available | Yes | No | -  
05 | Result data real time clock synchronization available | Yes | No | -  
06 | Result data speed/torque matrix available | Yes | No | -  

The individual result data and characteristic data are summarized in a corresponding file.
### List of parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p5007 Spindle file system selection / File sys select</td>
<td>Can be changed: T</td>
<td>Access level: 3</td>
</tr>
<tr>
<td>p5009 Adapt spindle file system / Adapt file sys</td>
<td>Can be changed: T</td>
<td>Access level: 3</td>
</tr>
</tbody>
</table>

#### p5007 Spindle file system selection / File sys select

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Result data clamping cycle thresholds selected</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>02</td>
<td>Result data clamping counter selected</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>03</td>
<td>Result data operating hours counter selected</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>04</td>
<td>Result data temperature diagnostics selected</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>05</td>
<td>Result data real time clock synchronization selected</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>06</td>
<td>Result data speed/torque matrix selected</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>17</td>
<td>Characteristic data clamping cycle counter selected</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>19</td>
<td>Characteristic data operating hours counter selected</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>20</td>
<td>Characteristic data temperature diagnostics selected</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>22</td>
<td>Characteristic data speed/torque matrix selected</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
</tbody>
</table>

#### p5009 Adapt spindle file system / Adapt file sys

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>-</td>
<td>0</td>
<td>53</td>
<td>0</td>
</tr>
</tbody>
</table>

---

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SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3
Parameter

List of parameters

--> p5009 = 51 ... 53: fault values if the operation was not able to be successfully completed.
--> carry out a POWER ON (switch-off/switch-on).

Value:
0: No function
1: Reset
2: Set invalid
3: Reserved
5: Set valid
20: Operation successfully completed.
40: Operation running
51: Function not supported
52: File access unsuccessful
53: Operation unsuccessful

Note:
Help for fault value = 51 ... 53:
- repeat the operation.

p5016 Enable spindle commissioning / Enable comm

SERVO_S110-CAN,
SERVO_S110-DP,
SERVO_S110-PN

Can be changed: C2, T
Data type: Integer16
P-Group: -
Not for motor type: -
Min 0
Max 1

Description:
Setting to enable/inhibit spindle commissioning.

Value:
0: Spindle commissioning enabled
1: Spindle commissioning inhibited

Note:
The parameter is automatically set to a value of 1 after exiting commissioning (p0009 = 0).

r7760 Write protection status / Write prot stat

Can be changed: -
Data type: Unsigned16
P-Group: -
Not for motor type: -
Min -
Max -

Description:
Displays the status for write protection of adjustable parameters.

Bit field:

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Write protection active</td>
<td></td>
<td></td>
<td>-</td>
</tr>
</tbody>
</table>

Note:
Write protection can be activated/deactivated via p7760 on the Control Unit.

p7761 Write protection / Write protection

Can be changed: U, T
Data type: Integer16
P-Group: -
Not for motor type: -
Min 0
Max 1

Description:
Setting for activating/de-activating the write protection for adjustable parameters.

Value:
0: Inactive
1: Active

Note:
The following parameters are excluded from the write protection:
- p0003 (BOP access level)
- p0971 (drive object save parameters)
- p0977 (save all parameters)
- p3950 (service parameters)
## Parameter

### List of parameters

- p3981 (acknowledge fault, drive object)
- p7760 (adjustable parameters write protection)

<table>
<thead>
<tr>
<th>p7820</th>
<th>DRIVE-CLiQ component component number / DLQ comp_no</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CU_S110-CAN, CU_S110-DP, CU_S110-PN</strong></td>
<td>Can be changed: U, T</td>
</tr>
<tr>
<td>Data type: Unsigned16</td>
<td>Dynamic index: -</td>
</tr>
<tr>
<td>P-Group: -</td>
<td>Units group: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
</tr>
<tr>
<td><strong>Min</strong></td>
<td><strong>Max</strong></td>
</tr>
<tr>
<td>0</td>
<td>65535</td>
</tr>
</tbody>
</table>

**Description:**
Sets the component number of the DRIVE-CLiQ component whose parameters are to be accessed.

**Dependency:**
Refer to: p7821, p7822, r7823

<table>
<thead>
<tr>
<th>p7821</th>
<th>DRIVE-CLiQ component parameter number / DLQ para_no</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CU_S110-CAN, CU_S110-DP, CU_S110-PN</strong></td>
<td>Can be changed: U, T</td>
</tr>
<tr>
<td>Data type: Unsigned16</td>
<td>Dynamic index: -</td>
</tr>
<tr>
<td>P-Group: -</td>
<td>Units group: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
</tr>
<tr>
<td><strong>Min</strong></td>
<td><strong>Max</strong></td>
</tr>
<tr>
<td>0</td>
<td>65535</td>
</tr>
</tbody>
</table>

**Description:**
Sets the parameter number to access a parameter of a DRIVE-CLiQ component.

**Dependency:**
Refer to: p7820, p7822, r7823

<table>
<thead>
<tr>
<th>p7822</th>
<th>DRIVE-CLiQ component parameter index / DLQ para_index</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CU_S110-CAN, CU_S110-DP, CU_S110-PN</strong></td>
<td>Can be changed: U, T</td>
</tr>
<tr>
<td>Data type: Unsigned16</td>
<td>Dynamic index: -</td>
</tr>
<tr>
<td>P-Group: -</td>
<td>Units group: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
</tr>
<tr>
<td><strong>Min</strong></td>
<td><strong>Max</strong></td>
</tr>
<tr>
<td>0</td>
<td>65535</td>
</tr>
</tbody>
</table>

**Description:**
Sets the parameter index to access a parameter of a DRIVE-CLiQ component.

**Dependency:**
Refer to: p7820, p7821, r7823

<table>
<thead>
<tr>
<th>r7823</th>
<th>DRIVE-CLiQ component read parameter value / Read DLQ value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CU_S110-CAN, CU_S110-DP, CU_S110-PN</strong></td>
<td>Can be changed: -</td>
</tr>
<tr>
<td>Data type: Unsigned32</td>
<td>Dynamic index: -</td>
</tr>
<tr>
<td>P-Group: -</td>
<td>Units group: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
</tr>
<tr>
<td><strong>Min</strong></td>
<td><strong>Max</strong></td>
</tr>
<tr>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Description:**
Displays the parameter value read from the DRIVE-CLiQ component.

**Dependency:**
Refer to: p7820, p7821, p7822

<table>
<thead>
<tr>
<th>r7825[0...6]</th>
<th>DRIVE-CLiQ component versions / DLQ version</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CU_S110-CAN, CU_S110-DP, CU_S110-PN</strong></td>
<td>Can be changed: -</td>
</tr>
<tr>
<td>Data type: Unsigned32</td>
<td>Dynamic index: -</td>
</tr>
<tr>
<td>P-Group: -</td>
<td>Units group: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
</tr>
<tr>
<td><strong>Min</strong></td>
<td><strong>Max</strong></td>
</tr>
<tr>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Description:**
Displays the firmware and EPROM versions of the DRIVE-CLiQ component selected using p7828[1].

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SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3

1-479
## List of parameters

### Index:

- **[0]** = Reference firmware version
- **[1]** = Actual firmware version
- **[2]** = EPROM0 version
- **[3]** = EPROM1 version
- **[4]** = EPROM2 version
- **[5]** = EPROM3 version
- **[6]** = EPROM4 version

### Note:

- Reference firmware version: Version on the memory card/device memory.
- Current firmware version: Actual version of the DRIVE-CLiQ component.
- EPROM version: Current EPROM version of the DRIVE-CLiQ component.

#### r7827

**Firmware update progress display / FW update progress**

- **CU_S110-CAN, CU_S110-DP, CU_S110-PN**
- **Can be changed:** -
- **Data type:** FloatingPoint32
- **P-Group:** -
- **Not for motor type:** -
- **Min:** - [%]
- **Max:** - [%]
- **Description:** Displays the progress when updating the firmware of the DRIVE-CLiQ components.

#### p7830

**Diagnostics telegram selection / Diag telegram**

- **SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**
- **Can be changed:** T
- **Data type:** Integer16
- **P-Group:** -
- **Not for motor type:** -
- **Min:** 0
- **Max:** 3
- **Description:** Selects a telegram whose contents should be shown in p7831 ... p7836.

#### r7831[0...15]

**Telegram diagnostics signals / Tel diag signals**

- **SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**
- **Can be changed:** -
- **Data type:** Integer16
- **P-Group:** -
- **Not for motor type:** -
- **Min:** 0
- **Max:** 15157
- **Description:** Displays the signals contained in the selected telegram (p7830).
<table>
<thead>
<tr>
<th>Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>10505: ENC_ID_SYNQ_PERIOD</td>
</tr>
<tr>
<td>10516: ENC_ID_ADC_TRACK_A</td>
</tr>
<tr>
<td>10517: ENC_ID_ADC_TRACK_B</td>
</tr>
<tr>
<td>10518: ENC_ID_ADC_TRACK_C</td>
</tr>
<tr>
<td>10519: ENC_ID_ADC_TRACK_D</td>
</tr>
<tr>
<td>10520: ENC_ID_ADC_TRACK_A_SAFETY</td>
</tr>
<tr>
<td>10521: ENC_ID_ADC_TRACK_B_SAFETY</td>
</tr>
<tr>
<td>10523: ENC_ID_ADC_TEMP_1</td>
</tr>
<tr>
<td>10526: ENC_ID_ADC_TRACK_R</td>
</tr>
<tr>
<td>10532: ENC_ID_TRACK_AB_X</td>
</tr>
<tr>
<td>10533: ENC_ID_TRACK_AB_Y</td>
</tr>
<tr>
<td>10534: ENC_ID_OFFSET_CORR_AB_X</td>
</tr>
<tr>
<td>10535: ENC_ID_OFFSET_CORR_AB_Y</td>
</tr>
<tr>
<td>10536: ENC_ID_AB_ABS_VALUE</td>
</tr>
<tr>
<td>10537: ENC_ID_TRACK_CD_X</td>
</tr>
<tr>
<td>10538: ENC_ID_TRACK_CD_Y</td>
</tr>
<tr>
<td>10539: ENC_IDTRACK_CD_ABS</td>
</tr>
<tr>
<td>10542: ENC_ID_AB_RAND_X</td>
</tr>
<tr>
<td>10543: ENC_ID_AB_RAND_Y</td>
</tr>
<tr>
<td>10544: ENC_ID_AB_RAND_ABS_VALUE</td>
</tr>
<tr>
<td>10545: ENC_ID_SUBTRACE_ABS_ARRAY</td>
</tr>
<tr>
<td>10546: ENC_ID_PROC_OFFSET_0</td>
</tr>
<tr>
<td>10547: ENC_ID_PROC_OFFSET_4</td>
</tr>
<tr>
<td>10564: ENC_SELFTEMP_ACT</td>
</tr>
<tr>
<td>10565: ENC_ID_MOTOR_TEMP_TOP</td>
</tr>
<tr>
<td>10566: ENC_ID_MOTOR_TEMP_1</td>
</tr>
<tr>
<td>10580: ENC_ID_RESISTANCE_1</td>
</tr>
<tr>
<td>10590: ENC_ID_ANA_CHAN_A</td>
</tr>
<tr>
<td>10591: ENC_ID_ANA_CHAN_B</td>
</tr>
<tr>
<td>10592: ENC_ID_ANA_CHAN_X</td>
</tr>
<tr>
<td>10593: ENC_ID_ANA_CHAN_Y</td>
</tr>
<tr>
<td>10596: ENC_ID_AB_ANGLE</td>
</tr>
<tr>
<td>10597: ENC_ID_CD_ANGLE</td>
</tr>
<tr>
<td>10598: ENC_ID_MECH_ANGLE_HI</td>
</tr>
<tr>
<td>10599: ENC_ID_RM_POS_PHI_COMMU</td>
</tr>
<tr>
<td>10600: ENC_ID_PHI_COMMU</td>
</tr>
<tr>
<td>10612: ENC_ID_DIFF_CD_INC</td>
</tr>
<tr>
<td>10613: ENC_ID_RM_POS_PHI_COMMU_RFG</td>
</tr>
<tr>
<td>10628: ENC_ID_MECH_ANGLE</td>
</tr>
<tr>
<td>10629: ENC_ID_MECH_RM_POS</td>
</tr>
<tr>
<td>10644: ENC_ID_INIT_VECTOR</td>
</tr>
<tr>
<td>10645: FEAT_INIT_VEKTO</td>
</tr>
<tr>
<td>10660: ENC_ID_SENSOR_STATE</td>
</tr>
<tr>
<td>10661: ENC_ID_BASIC_SYSTEM</td>
</tr>
<tr>
<td>10662: ENC_ID_REMARK_STATUS</td>
</tr>
<tr>
<td>10663: ENC_ID_DSA_STATUS1_SENSOR</td>
</tr>
<tr>
<td>10664: ENC_ID_DSA_RMSTAT_HANDSHAKE</td>
</tr>
<tr>
<td>10665: ENC_ID_DSA_CONTROL1_SENSOR</td>
</tr>
<tr>
<td>10667: ENC_ID_SAFETY</td>
</tr>
<tr>
<td>10676: ENC_ID_COUNTCORR_SAW_VALUE</td>
</tr>
<tr>
<td>10677: ENC_ID_COUNTCORR_ABS_VALUE</td>
</tr>
<tr>
<td>10678: ENC_ID_SAWTOOTH_CORR</td>
</tr>
<tr>
<td>10692: ENC_ID_RESISTANCE_CALIB_INSTANT</td>
</tr>
<tr>
<td>10693: ENC_ID_SERPROT_POS</td>
</tr>
<tr>
<td>10724: ENC_ID_ACT_FUNMAN_FUNCTION</td>
</tr>
<tr>
<td>10725: ENC_ID_SAFETY_COUNTER_CRC</td>
</tr>
<tr>
<td>10740: ENC_ID_POS_ABSOLUTE</td>
</tr>
<tr>
<td>10741: ENC_ID_POS_REMARK</td>
</tr>
<tr>
<td>10742: ENC_ID_SAWTOOTH</td>
</tr>
<tr>
<td>10743: ENC_ID_SAFETY_PULSE_COUNTER</td>
</tr>
<tr>
<td>10756: ENC_ID_DSA_ACTUAL_SPEED</td>
</tr>
<tr>
<td>10757: ENC_ID_SPEED_DEV_ABS</td>
</tr>
<tr>
<td>10772: ENC_ID_DSA_POS_XIST1</td>
</tr>
<tr>
<td>10788: ENC_ID_AB_CROSS_CORR</td>
</tr>
</tbody>
</table>
### List of parameters

#### r7832[0...15]
**Telegram diagnostics numerical format / tel diag format**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENC_ID_AB_GAIN_Y_CORR</td>
<td>Displays the original numerical format of the signals contained in the telegram. The associated signal number is represented in the appropriate index of r7831.</td>
<td>-1: Unknown, 0: Boolean, 1: Signed 1 byte, 2: Signed 2 byte, 3: Signed 4 byte, 4: Signed 8 byte, 5: Unsigned 1 byte, 6: Unsigned 2 byte, 7: Unsigned 4 byte, 8: Unsigned 8 byte, 9: Float 4 byte, 10: Double 8 byte, 11: mm dd yy HH MM SS MS DOW, 12: ASCII string, 13: SIMUMERIK frame type, 14: SIMUMERIK axis type</td>
</tr>
<tr>
<td>ENC_ID_AB_PEAK_CORR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENC_ID_RES_TRANSITION_RATIO</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENC_ID_RES_PHASE_SHIFT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENC_ID_SPINDLE_S1_RAW</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENC_ID_SPINDLE_S4_RAW</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENC_ID_SPINDLE_S5_RAW</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENC_ID_SPINDLE_S1_CAL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENC_ID_SPINDLE_S4_CAL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENC_ID_SPINDLE_S5_CAL</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### r7833[0...15]
**Telegram diagnostics unsigned / Tel diag unsigned**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENC_ID_AB_GAIN_Y_CORR</td>
<td>Displays the original numerical format of the signals contained in the telegram. The associated signal number is represented at the appropriate index in r7831.</td>
<td>-1: Unknown, 0: Boolean, 1: Signed 1 byte, 2: Signed 2 byte, 3: Signed 4 byte, 4: Signed 8 byte, 5: Unsigned 1 byte, 6: Unsigned 2 byte, 7: Unsigned 4 byte, 8: Unsigned 8 byte, 9: Float 4 byte, 10: Double 8 byte, 11: mm dd yy HH MM SS MS DOW, 12: ASCII string, 13: SIMUMERIK frame type, 14: SIMUMERIK axis type</td>
</tr>
<tr>
<td>ENC_ID_AB_PEAK_CORR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENC_ID_RES_TRANSITION_RATIO</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENC_ID_RES_PHASE_SHIFT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENC_ID_SPINDLE_S1_RAW</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENC_ID_SPINDLE_S4_RAW</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENC_ID_SPINDLE_S5_RAW</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENC_ID_SPINDLE_S1_CAL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENC_ID_SPINDLE_S4_CAL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENC_ID_SPINDLE_S5_CAL</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### r7834[0...15]
**Telegram diagnostics signed / Tel diag signed**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENC_ID_AB_GAIN_Y_CORR</td>
<td>Parameter to display a DSA signal in the signed-integer format. The associated signal number is represented at the appropriate index in r7831.</td>
<td>-1: Unknown, 0: Boolean, 1: Signed 1 byte, 2: Signed 2 byte, 3: Signed 4 byte, 4: Signed 8 byte, 5: Unsigned 1 byte, 6: Unsigned 2 byte, 7: Unsigned 4 byte, 8: Unsigned 8 byte, 9: Float 4 byte, 10: Double 8 byte, 11: mm dd yy HH MM SS MS DOW, 12: ASCII string, 13: SIMUMERIK frame type, 14: SIMUMERIK axis type</td>
</tr>
<tr>
<td>ENC_ID_AB_PEAK_CORR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENC_ID_RES_TRANSITION_RATIO</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENC_ID_RES_PHASE_SHIFT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENC_ID_SPINDLE_S1_RAW</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENC_ID_SPINDLE_S4_RAW</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENC_ID_SPINDLE_S5_RAW</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENC_ID_SPINDLE_S1_CAL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENC_ID_SPINDLE_S4_CAL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENC_ID_SPINDLE_S5_CAL</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### List of parameters

**Parameter 1-483**

**Description:**
Parameter to display a DSA signal in the float format.

The associated signal number is represented at the appropriate index in r7831.

**Value:**
-1: Unknown
0: None
1: Millimeter or degrees
2: Millimeter
3: Degrees
4: mm/min or RPM
5: Millimeter / min
6: Revolutions / min
7: m/sec^2 or U/sec^2
8: m/sec^2
9: U/sec^2
10: m/sec^3 or U/sec^3
11: m/sec^3
12: U/sec^3
13: sec
14: 16.667 / sec
15: mm/revolution
16: ACX_UNIT_COMPENSATION_CORR
18: Newton
19: Kilogram
20: Kilogram meter^2
21: Percent
22: Hertz
23: Volt peak-to-peak
24: Amps peak-to-peak
25: Degrees Celsius
26: Degrees
28: Millimeter or degrees
29: Meters / minute
30: Meters / second
31: ohm
32: Millihenry
33: Newton meter
34: Newton meter/Ampere
35: Volt/Ampere
36: Newton meter second / rad
38: 31.25 microseconds
39: Microseconds
40: Milliseconds

---

**Parameter 2-483**

**Description:**
Displays the units of a DSA signal.

The associated signal number is represented at the appropriate index in r7831.

**Value:**
-1: Unknown
0: None
1: Millimeter or degrees
2: Millimeter
3: Degrees
4: mm/min or RPM
5: Millimeter / min
6: Revolutions / min
7: m/sec^2 or U/sec^2
8: m/sec^2
9: U/sec^2
10: m/sec^3 or U/sec^3
11: m/sec^3
12: U/sec^3
13: sec
14: 16.667 / sec
15: mm/revolution
16: ACX_UNIT_COMPENSATION_CORR
18: Newton
19: Kilogram
20: Kilogram meter^2
21: Percent
22: Hertz
23: Volt peak-to-peak
24: Amps peak-to-peak
25: Degrees Celsius
26: Degrees
28: Millimeter or degrees
29: Meters / minute
30: Meters / second
31: ohm
32: Millihenry
33: Newton meter
34: Newton meter/Ampere
35: Volt/Ampere
36: Newton meter second / rad
38: 31.25 microseconds
39: Microseconds
40: Milliseconds
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>42</td>
<td>Kilowatt</td>
</tr>
<tr>
<td>43</td>
<td>Micro amps peak-to-peak</td>
</tr>
<tr>
<td>44</td>
<td>Volt seconds</td>
</tr>
<tr>
<td>45</td>
<td>Microvolt seconds</td>
</tr>
<tr>
<td>46</td>
<td>Micro newton meters</td>
</tr>
<tr>
<td>47</td>
<td>Amps / volt seconds</td>
</tr>
<tr>
<td>48</td>
<td>Per mille</td>
</tr>
<tr>
<td>49</td>
<td>Hertz / second</td>
</tr>
<tr>
<td>53</td>
<td>Micrometer or millidegrees</td>
</tr>
<tr>
<td>54</td>
<td>Micrometer</td>
</tr>
<tr>
<td>55</td>
<td>Millidegrees</td>
</tr>
<tr>
<td>59</td>
<td>Nanometer</td>
</tr>
<tr>
<td>61</td>
<td>Newton/Amps</td>
</tr>
<tr>
<td>62</td>
<td>Volt seconds/meter</td>
</tr>
<tr>
<td>63</td>
<td>Newton seconds/meter</td>
</tr>
<tr>
<td>64</td>
<td>Micronewton</td>
</tr>
<tr>
<td>65</td>
<td>Liters / minute</td>
</tr>
<tr>
<td>66</td>
<td>Bar</td>
</tr>
<tr>
<td>67</td>
<td>Cubic centimeters</td>
</tr>
<tr>
<td>68</td>
<td>Millimeter / volt minute</td>
</tr>
<tr>
<td>69</td>
<td>Newton/Volt</td>
</tr>
<tr>
<td>80</td>
<td>Millivolts peak-to-peak</td>
</tr>
<tr>
<td>81</td>
<td>Volt rms</td>
</tr>
<tr>
<td>82</td>
<td>Millivolts rms</td>
</tr>
<tr>
<td>83</td>
<td>Amps rms</td>
</tr>
<tr>
<td>84</td>
<td>Micro amps rms</td>
</tr>
<tr>
<td>85</td>
<td>Micrometers / revolution</td>
</tr>
<tr>
<td>90</td>
<td>Tenths of a second</td>
</tr>
<tr>
<td>91</td>
<td>Hundredths of a second</td>
</tr>
<tr>
<td>92</td>
<td>10 microseconds</td>
</tr>
<tr>
<td>93</td>
<td>Pulses</td>
</tr>
<tr>
<td>94</td>
<td>256 pulses</td>
</tr>
<tr>
<td>95</td>
<td>Tenths of a pulse</td>
</tr>
<tr>
<td>96</td>
<td>Revolutions</td>
</tr>
<tr>
<td>97</td>
<td>100 revolutions / minute</td>
</tr>
<tr>
<td>98</td>
<td>10 revolutions / minute</td>
</tr>
<tr>
<td>99</td>
<td>0.1 revolutions / minute</td>
</tr>
<tr>
<td>100</td>
<td>Thousandth revolution / minute</td>
</tr>
<tr>
<td>101</td>
<td>Pulses / second</td>
</tr>
<tr>
<td>102</td>
<td>100 pulses / second</td>
</tr>
<tr>
<td>103</td>
<td>10 revolutions / (minute x seconds)</td>
</tr>
<tr>
<td>104</td>
<td>10000 pulses/second*2</td>
</tr>
<tr>
<td>105</td>
<td>0.1 Hertz</td>
</tr>
<tr>
<td>106</td>
<td>0.01 Hertz</td>
</tr>
<tr>
<td>107</td>
<td>0.1 / seconds</td>
</tr>
<tr>
<td>108</td>
<td>Factor 0.1</td>
</tr>
<tr>
<td>109</td>
<td>Factor 0.01</td>
</tr>
<tr>
<td>110</td>
<td>Factor 0.001</td>
</tr>
<tr>
<td>111</td>
<td>Factor 0.0001</td>
</tr>
<tr>
<td>112</td>
<td>0.1 Volt peak-to-peak</td>
</tr>
<tr>
<td>113</td>
<td>0.1 Volt peak-to-peak</td>
</tr>
<tr>
<td>114</td>
<td>0.1 amps peak-to-peak</td>
</tr>
<tr>
<td>115</td>
<td>Watt</td>
</tr>
<tr>
<td>116</td>
<td>100 Watt</td>
</tr>
<tr>
<td>117</td>
<td>10 Watt</td>
</tr>
<tr>
<td>118</td>
<td>0.01 percent</td>
</tr>
<tr>
<td>119</td>
<td>1/second*3</td>
</tr>
<tr>
<td>120</td>
<td>0.01 percent/millisecond</td>
</tr>
<tr>
<td>121</td>
<td>Pulses / revolution</td>
</tr>
<tr>
<td>122</td>
<td>Microfarads</td>
</tr>
<tr>
<td>123</td>
<td>Milliohm</td>
</tr>
<tr>
<td>124</td>
<td>0.01 Newton meter</td>
</tr>
<tr>
<td>125</td>
<td>Kilogram millimeter*2</td>
</tr>
<tr>
<td>126</td>
<td>Rad / (seconds newton meter)</td>
</tr>
</tbody>
</table>
### List of parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>127: Henry</td>
<td>Displays the actual serial number of the memory card. The individual characters of the serial number are displayed in the ASCII code in the indices.</td>
</tr>
<tr>
<td>128: Kelvin</td>
<td></td>
</tr>
<tr>
<td>129: Hours</td>
<td></td>
</tr>
<tr>
<td>130: KiloHertz</td>
<td></td>
</tr>
<tr>
<td>131: Milliamperes peak-to-peak</td>
<td></td>
</tr>
<tr>
<td>132: Millifarads</td>
<td></td>
</tr>
<tr>
<td>133: Meter</td>
<td></td>
</tr>
<tr>
<td>135: Kilowatt hours</td>
<td></td>
</tr>
<tr>
<td>136: Percent</td>
<td></td>
</tr>
<tr>
<td>137: Amps / Volt</td>
<td></td>
</tr>
<tr>
<td>138: Volt</td>
<td></td>
</tr>
<tr>
<td>139: Millivolts</td>
<td></td>
</tr>
<tr>
<td>140: Microvolts</td>
<td></td>
</tr>
<tr>
<td>141: Amps</td>
<td></td>
</tr>
<tr>
<td>142: Milliamperes</td>
<td></td>
</tr>
<tr>
<td>143: Micro amps</td>
<td></td>
</tr>
<tr>
<td>144: Milliamperes rms</td>
<td></td>
</tr>
<tr>
<td>145: Millimeter</td>
<td></td>
</tr>
<tr>
<td>146: Nanometer</td>
<td></td>
</tr>
<tr>
<td>147: Joules</td>
<td></td>
</tr>
</tbody>
</table>

#### r7843[0...20]

**Memory card serial number / Mem_card ser.no**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed: -</td>
<td>Displays the actual serial number of the memory card.</td>
</tr>
<tr>
<td>Data type: Unsigned8</td>
<td>The individual characters of the serial number are displayed in the ASCII code in the indices.</td>
</tr>
<tr>
<td>P-Group: -</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td></td>
</tr>
<tr>
<td>Max</td>
<td></td>
</tr>
</tbody>
</table>

**Dependency:** Refer to: p9920, p9921

**Notice:** An ASCII table (excerpt) can be found, for example, in the appendix to the List Manual.

**Example:**
- r7843[0] = 49 dec --> ASCII characters = "1" --> serial number, character 1
- r7843[1] = 49 dec --> ASCII characters = "1" --> serial number, character 2
- r7843[2] = 49 dec --> ASCII characters = "1" --> serial number, character 3
- r7843[3] = 57 dec --> ASCII characters = "9" --> serial number, character 4
- r7843[4] = 50 dec --> ASCII characters = "2" --> serial number, character 5
- r7843[5] = 51 dec --> ASCII characters = "3" --> serial number, character 6
- r7843[6] = 69 dec --> ASCII characters = "E" --> serial number, character 7
- r7843[7] = 0 dec --> ASCII characters = " " --> serial number, character 8
- r7843[19] = 0 dec --> ASCII characters = " " --> serial number, character 20
- r7843[20] = 0 dec

Serial number = 111923E

#### r7844[0...1]

**Memory card/device memory firmware version / Mem_crd/dev_mem FW**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed: -</td>
<td>Displays the version of the firmware stored on the memory card/device memory.</td>
</tr>
<tr>
<td>Data type: Unsigned32</td>
<td>Index 0: Firmware version internal (e.g. 01203300)</td>
</tr>
<tr>
<td>P-Group: -</td>
<td>Index 1: Firmware version external (e.g. 01020000 -&gt; 1.2)</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td></td>
</tr>
</tbody>
</table>

**Dependency:**

**Notice:**

An ASCII table (excerpt) can be found, for example, in the appendix to the List Manual.

**Example:**
- r7844[0] = 0 dec --> ASCII characters = " " --> serial number, character 1
- r7844[1] = 0 dec --> ASCII characters = " " --> serial number, character 2

Serial number = 01020000
### Parameter List

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>r7850[0...23]</td>
<td>Drive object operational/not operational / DO ready for oper</td>
</tr>
<tr>
<td>p7852</td>
<td>Number of indices for r7853 / Qty indices r7853</td>
</tr>
<tr>
<td>r7853[0...n]</td>
<td>Component available/not available / Comp present</td>
</tr>
<tr>
<td>p7857</td>
<td>Sub-boot mode / Sub-boot mode</td>
</tr>
</tbody>
</table>

#### r7850[0...23] - Drive object operational/not operational / DO ready for oper
- **CU_S110-CAN, CU_S110-DP, CU_S110-PN**
- **Can be changed:** -
- **Data type:** Integer16
- **P-Group:** -
- **Not for motor type:** -
- **Min:** -32786
- **Max:** 32767
- **Access level:** 4

**Description:**
Displays whether, for an activated drive object, all activated topology components are available or not (or whether these can be addressed).

0: Drive object not ready for operation
1: Drive object ready for operation

#### p7852 - Number of indices for r7853 / Qty indices r7853
- **CU_S110-CAN, CU_S110-DP, CU_S110-PN**
- **Can be changed:** U, T
- **Data type:** Unsigned16
- **P-Group:** -
- **Not for motor type:** -
- **Min:** 1
- **Max:** 200
- **Access level:** 4

**Description:**
Displays the number of indices for r7853[0...n].

This corresponds to the number of DRIVE-CLiQ components that are in the target topology.

**Dependency:**
Refer to: r7853

**Note:**
The values are valid if all available Control Units adopt the "Initialization finished" state (r3988 = 800) following power-up.

#### r7853[0...n] - Component available/not available / Comp present
- **CU_S110-CAN, CU_S110-DP, CU_S110-PN**
- **Can be changed:** -
- **Data type:** Unsigned16
- **P-Group:** -
- **Not for motor type:** -
- **Min:** 0000 hex
- **Max:** FFFF hex
- **Access level:** 4

**Description:**
Displays the component and whether this component is currently present.

High byte: Component number

Low byte: 0/1 (not available/available)

**Dependency:**
Refer to: p7852

**Note:**
The values are valid if all available Control Units adopt the "Initialization finished" state (r3988 = 800) following power-up.

#### p7857 - Sub-boot mode / Sub-boot mode
- **SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**
- **Can be changed:** U, T
- **Data type:** Integer16
- **P-Group:** -
- **Not for motor type:** -
- **Min:** 0
- **Max:** 1
- **Access level:** 4

**Description:**
Sets the mode for the sub-boot.

**Value:**
0: Sub-boot manual
1: Sub-boot automatic

**Note:**
For p7857 = 0 (manual sub-boot) the following applies:
The parameter should be set to 1 to start the sub-boot.
**List of parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
</table>
| p7859[0..199] | **Component number global / Comp_nr global**
| **Component number global / Comp_nr global** | Sets the global and unique component number in a drive system with several Control Units. Each index of the parameter corresponds to a possible local component number on the corresponding Control Unit. The indices are allocated to the global component numbers as follows:
| p7859[0]: Not used | p7859[1]: Sets the global component number for the local component number 1
| p7859[2]: Sets the global component number for the local component number 2 | ...
| p7859[199]: Sets the global component number for the local component number 199 |
| **Notice:** | This parameter is preferably set via suitable commissioning software (e.g. UpdateAgent, STARTER, SCOUT).
| Changing the parameter via the AOP (Advanced Operator Panel) or BOP (Basic Operator Panel) can destroy a valid unique setting. |
| **Note:** | The parameter is not influenced by setting the factory setting. |

| r7867 | **Status/configuration changes global / Changes global**
| **Status/configuration changes global / Changes global** | Displays status and configuration changes of all of the drive objects in the complete unit. When changing the status or the configuration of the Control Unit or a drive object, the value of this parameter is incremented.
| **Dependency:** | Refer to: r7868, r7869, r7870 |

| r7868[0..24] | **Configuration changes drive object reference / Config_chng DO ref**
| **Configuration changes drive object reference / Config_chng DO ref** | Reference to the drive objects whose configuration has changed.
| Index 0: | When changing one of the following indices, then the value in this index is increased.
| Index 1..n: | The drive object with object number in p0101[n-1] has changed its configuration.
| Example: | r7868[3] was incremented since the last time it was read.
| --> | the configuration of the drive object with object number in p0101[2] was changed. |

```plaintext
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>p7859[0...199]</td>
<td>U, T</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>r7867</td>
<td>-</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>r7868[0...24]</td>
<td>-</td>
<td>-</td>
<td>4</td>
</tr>
</tbody>
</table>
```
### r7869[0...24] Status changes drive object reference / Status_chng DO ref

<table>
<thead>
<tr>
<th>Description</th>
<th>CU_S110-CAN, CU_S110-DP, CU_S110-PN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed:</td>
<td>Calculated:</td>
</tr>
<tr>
<td>Data type: Unsigned32</td>
<td>Dynamic index:</td>
</tr>
<tr>
<td>P-Group:</td>
<td>Units group:</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>Scaling:</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td>Factory setting</td>
<td></td>
</tr>
</tbody>
</table>

#### Index

<table>
<thead>
<tr>
<th>Index</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>[0] = Sum of the following indices</td>
<td></td>
</tr>
<tr>
<td>[1] = Object number in p0101[0]</td>
<td></td>
</tr>
<tr>
<td>[17] = Object number in p0101[16]</td>
<td></td>
</tr>
<tr>
<td>[18] = Object number in p0101[17]</td>
<td></td>
</tr>
<tr>
<td>[19] = Object number in p0101[18]</td>
<td></td>
</tr>
<tr>
<td>[22] = Object number in p0101[21]</td>
<td></td>
</tr>
<tr>
<td>[23] = Object number in p0101[22]</td>
<td></td>
</tr>
<tr>
<td>[24] = Object number in p0101[23]</td>
<td></td>
</tr>
</tbody>
</table>

#### Dependency

Refer to: p0101, r7867, r7871

---

**Parameters**

**List of parameters**

[17] = Object number in p0101[16]
[18] = Object number in p0101[17]
[19] = Object number in p0101[18]
[22] = Object number in p0101[21]
[23] = Object number in p0101[22]
[24] = Object number in p0101[23]
## List of parameters

### Dependency:
Refer to: p0101, r7867, r7872

### r7870[0...7] Configuration changes global / Config_chng global

<table>
<thead>
<tr>
<th>CU_S110-CAN, CU_S110-DP, CU_S110-PN</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Can be changed:</strong></td>
</tr>
<tr>
<td><strong>Data type:</strong></td>
</tr>
<tr>
<td><strong>P-Group:</strong></td>
</tr>
<tr>
<td><strong>Not for motor type:</strong></td>
</tr>
<tr>
<td><strong>Min</strong></td>
</tr>
<tr>
<td><strong>Expert list:</strong></td>
</tr>
</tbody>
</table>

**Description:**
Displays the configuration changes of all of the drive objects in the complete unit.

**Index:**
- [0] = Sum of the following indices
- [1] = r7871[0] of a drive object
- [2] = p0101 or r0102
- [3] = PROFIBUS configuration (p0978)
- [4] = DRIVE-CLiQ actual topology (r9900 or r9901)
- [5] = DRIVE-CLiQ target topology (r9902 or r9903)
- [6] = DRIVE-CLiQ ports (p0109)
- [7] = OA applications

**Dependency:**
Refer to: r7867, r7871

**Note:**
- Index 0:
  When changing one of the following indices, then the value in this index is incremented.
- Index 1:
  Drive object configuration. When changing r7871[0] on a drive object, the value in this index is incremented.
- Index 2:
  Drive object, configuration unit. When changing either p0101 or r0102, the value in this index is incremented.
- Index 3:
  PROFIBUS configuration unit. When changing p0978, the value in this index is incremented.
- Index 4:
  DRIVE-CLiQ actual topology. When changing either r9900 or r9901, the value in this index is incremented.
- Index 5:
  DRIVE-CLiQ target topology. When changing either p9902 or p9903, the value in this index is incremented.
- Index 6:
  DRIVE-CLiQ ports. When changing p0109, the value in this index is incremented.
- Index 7:
  OA applications. When changing OA applications, the value in this index is incremented.

### r7871[0...10] Configuration changes drive object / Config_chng DO

<table>
<thead>
<tr>
<th>CU_S110-CAN, CU_S110-DP, CU_S110-PN</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Can be changed:</strong></td>
</tr>
<tr>
<td><strong>Data type:</strong></td>
</tr>
<tr>
<td><strong>P-Group:</strong></td>
</tr>
<tr>
<td><strong>Not for motor type:</strong></td>
</tr>
<tr>
<td><strong>Min</strong></td>
</tr>
<tr>
<td><strong>Expert list:</strong></td>
</tr>
</tbody>
</table>

**Description:**
Displays the configuration changes on the drive object.

**Index:**
- [0] = Sum of the following indices
- [1] = p0107 or p0108
- [2] = Drive object name (p0199)
- [3] = Structure-relevant parameters (e.g. p0180)
- [4] = BICO interconnections
- [5] = Activate/de-activate drive object
- [6] = Data backup required
- [7] = Reserved
- [8] = Reference or changeover parameters (e.g. p2000)
Parameter

List of parameters

[9] = Parameter count through Drive Control Chart (DCC)
[10] = p0107 or p0108

Dependency:
Refer to: r7868, r7870

Note:
Re index 0:
When changing one of the following indices, then the value in this index is incremented.
Re index 1:
Drive object commissioning: When changing either p0107 or p0108, the value in this index is incremented.
Re index 2:
Drive object name. When changing p0199, the value in this index is incremented.
Re index 3:
Drive object structure. When changing a parameter that is relevant for the structure (e.g. number of data sets), the value in this index is incremented.
Re index 4:
Drive object BICO interconnections. When changing r3977, the value in this index is incremented.
Re index 5:
Drive object activity. When changing p0105, the value in this index is incremented.
Re index 6:
Drive object, data save.
0: There are no parameter changes to save.
1: There are parameter changes to save.
Re index 8:
Drive object changeover of units. When changing reference or changeover parameters (e.g. p2000, p0304), the value in this index is incremented.
Re index 9:
Drive object parameter count. When changing the number of parameters by loading Drive Control Chart (DCC), the value in this index is incremented.
Re index 10:
Drive object configuration. When changing either p0107 or p0108, the value in this index is incremented.

Description:
Displays the configuration changes on the drive object.

Index:
[0] = Sum of the following indices
[1] = p0010, p0107 or p0108
[2] = Drive object name (p0199)
[3] = Structure-relevant parameters (e.g. p0180)
[4] = BICO interconnections
[5] = Activate/de-activate drive object
[6] = Data backup required
[7] = Activate/de-activate component
[8] = Reference or changeover parameters (e.g. p2000)
[9] = Parameter count through Drive Control Chart (DCC)
[10] = p0107 or p0108
[11] = p0530 or p0531
[12] = Reserved
[13] = Reserved
[14] = Reserved
[15] = SERVO or VECTOR (e.g. p0300)

Dependency:
Refer to: r7868, r7870

---

r7871[0...15] Configuration changes drive object / Config_chng DO

SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

Can be changed: - Calculated: - Access level: 4
Data type: Unsigned32 Dynamic index: - Func. diagram: -
P-Group: - Units group: -
Not for motor type: - Scaling: - Expert list: 1
Min Max Factory setting

Description:
Displays the configuration changes on the drive object.

Index:
[0] = Sum of the following indices
[1] = p0010, p0107 or p0108
[2] = Drive object name (p0199)
[3] = Structure-relevant parameters (e.g. p0180)
[4] = BICO interconnections
[5] = Activate/de-activate drive object
[6] = Data backup required
[7] = Activate/de-activate component
[8] = Reference or changeover parameters (e.g. p2000)
[9] = Parameter count through Drive Control Chart (DCC)
[10] = p0107 or p0108
[11] = p0530 or p0531
[12] = Reserved
[13] = Reserved
[14] = Reserved
[15] = SERVO or VECTOR (e.g. p0300)

Dependency:
Refer to: r7868, r7870
Note:

Re index 0:
When changing one of the following indices, then the value in this index is incremented.

Re index 1:
Drive object commissioning: When changing p0010, p0107 or p0108, the value in this index is incremented.

Re index 2:
Drive object name. When changing p0199, the value in this index is incremented.

Re index 3:
Drive object structure. When changing a parameter that is relevant for the structure (e.g. number of data sets), the value in this index is incremented.

Re index 4:
Drive object BICO interconnections. When changing r3977, the value in this index is incremented.

Re index 5:
Drive object activity: When changing p0105, the value in this index is incremented.

Re index 6:
Drive object, data save.
0: There are no parameter changes to save.
1: There are parameter changes to save.

Re index 7:
Drive object component activity: When changing either p0125 or p0145, the value in this index is incremented.

Re index 8:
Drive object changeover of units. When changing reference or changeover parameters (e.g. p2000, p0304), the value in this index is incremented.

Re index 9:
Drive object parameter count. When changing the number of parameters by loading Drive Control Chart (DCC), the value in this index is incremented.

Re index 10:
Drive object configuration. When changing either p0107 or p0108, the value in this index is incremented.

Re index 11:
Drive object bearing. When changing p0530 or p0531, the value in this index is incremented.

Re index 15:
SERVO/VECTOR configuration. When changing p0300, p0301 or p0400, the value in this index is incremented.

---

r7872[0...3] Status changes drive object / Status_chng DO

<table>
<thead>
<tr>
<th>All objects</th>
<th>Can be changed: -</th>
<th>Calculated: -</th>
<th>Access level: 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type:</td>
<td>Dynamic index: -</td>
<td>Func. diagram: -</td>
<td></td>
</tr>
<tr>
<td>P-Group:</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
<td></td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

Description:
Displays the status changes on the drive object.

Index 0:
When changing one of the following indices, then the value in this index is incremented.

Index 1:
Drive object faults. When changing r0944, the value in this index is incremented.

Index 2:
Drive object alarms. When changing r2121, the value in this index is incremented.

Index 3:
Drive object safety messages. When changing r9744, the value in this index is incremented.

Index: [0] = Sum of the following indices
[1] = Faults (r0944)
[2] = Alarms (r2121)
[3] = Safety messages (r9744)

Dependency: Refer to: r7869
Parameter

List of parameters

<table>
<thead>
<tr>
<th>p7900[0...23]</th>
<th>Drive objects priority / DO priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>CU_S110-CAN,</td>
<td>Can be changed: U, T</td>
</tr>
<tr>
<td>CU_S110-DP,</td>
<td>Calculated: -</td>
</tr>
<tr>
<td>CU_S110-PN</td>
<td>Dynamic index: -</td>
</tr>
<tr>
<td></td>
<td>P-Group: -</td>
</tr>
<tr>
<td></td>
<td>Units group: -</td>
</tr>
<tr>
<td></td>
<td>Not for motor type: -</td>
</tr>
<tr>
<td></td>
<td>Scaling: -</td>
</tr>
<tr>
<td></td>
<td>Expert list: 1</td>
</tr>
<tr>
<td></td>
<td>Min</td>
</tr>
<tr>
<td></td>
<td>Max</td>
</tr>
<tr>
<td></td>
<td>Factory setting</td>
</tr>
<tr>
<td>0</td>
<td>65535</td>
</tr>
</tbody>
</table>

Description:
Sets the priority for processing the existing drive objects in the system. The parameter enables a free sequence to be set for processing the drive objects. For this purpose all the drive object numbers existing in the system have to be written in the desired sequence into the corresponding indices of the parameter. After re-booting this sequence will be effective without a plausibility check.

With the factory setting the following priorities regarding processing are applicable:
- The drive objects are pre-sorted according to their type as follows: CONTROL UNIT, INFEED, SERVO, VECTOR, TM, HUB, CU-LINK
- If they are of the same type, they are sorted in ascending order according to their drive object number, i.e. the lower the number, the higher the priority for processing.

Index:

- [0] = Drive object number Control Unit
- [1] = Drive object number object 1
- [2] = Drive object number object 2
- [3] = Drive object number object 3
- [4] = Drive object number object 4
- [5] = Drive object number object 5
- [6] = Drive object number object 6
- [7] = Drive object number object 7
- [8] = Drive object number object 8
- [9] = Drive object number object 9
- [10] = Drive object number object 10
- [11] = Drive object number object 11
- [12] = Drive object number object 12
- [13] = Drive object number object 13
- [14] = Drive object number object 14
- [15] = Drive object number object 15
- [16] = Drive object number object 16
- [17] = Drive object number object 17
- [18] = Drive object number object 18
- [19] = Drive object number object 19
- [20] = Drive object number object 20
- [21] = Drive object number object 21
- [22] = Drive object number object 22
- [23] = Drive object number object 23

Notice:
This parameter may only be used by qualified service personnel.

Note:
If the same drive object numbers are used and if the existing drive object numbers in the system are entered incompletely, the content of this parameter is ignored entirely. The behavior as with factory setting will then become effective.

<table>
<thead>
<tr>
<th>r7901[0...43]</th>
<th>Sampling times / t_sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>CU_S110-CAN,</td>
<td>Can be changed: -</td>
</tr>
<tr>
<td>CU_S110-DP,</td>
<td>Calculated: -</td>
</tr>
<tr>
<td>CU_S110-PN</td>
<td>Dynamic index: -</td>
</tr>
<tr>
<td></td>
<td>P-Group: -</td>
</tr>
<tr>
<td></td>
<td>Units group: -</td>
</tr>
<tr>
<td></td>
<td>Not for motor type: -</td>
</tr>
<tr>
<td></td>
<td>Scaling: -</td>
</tr>
<tr>
<td></td>
<td>Expert list: 1</td>
</tr>
<tr>
<td></td>
<td>Min [-µs]</td>
</tr>
<tr>
<td></td>
<td>Max [-µs]</td>
</tr>
<tr>
<td></td>
<td>Factory setting [-µs]</td>
</tr>
</tbody>
</table>

Description:
Displays the sampling times currently present on the drive unit. For r7901[x] = 0, the following applies: The time slice is not active.
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>r7903</td>
<td>Displays the number of hardware sampling times that can still be assigned. These free sampling times can be used by OA applications such as DCC (Drive Control Chart) or FBLOCKS (free function blocks).</td>
</tr>
<tr>
<td>p8500[0...7]</td>
<td>Sets the signal source for bitwise data transfer. These signals are available in BO: r8510.0 ... 7 for further interconnection.</td>
</tr>
<tr>
<td>p8501[0...21]</td>
<td>Sets the signal source for bitwise data transfer. These signals are available in BO: r8511.0 ... 15 for further interconnection.</td>
</tr>
</tbody>
</table>
Parameter

List of parameters

[15] = Send signal to BO: r8511.15
[16] = Send signal to BO: r8511.16
[17] = Send signal to BO: r8511.17
[18] = Send signal to BO: r8511.18
[19] = Send signal to BO: r8511.19
[20] = Send signal to BO: r8511.20
[21] = Send signal to BO: r8511.21

Dependency: Refer to: r8511

<table>
<thead>
<tr>
<th>p8502</th>
<th>CI: Data transfer 0 wordwise / Transfer 0 word</th>
</tr>
</thead>
<tbody>
<tr>
<td>CU_S110-CAN, CU_S110-DP, CU_S110-PN</td>
<td>Can be changed: U, T Calculated: - Access level: 2</td>
</tr>
<tr>
<td>Data type: Unsigned32 / Integer32 Dynamic index: -</td>
<td>Func. diagram: -</td>
</tr>
<tr>
<td>P-Group: - Units group: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type: - Scaling: PERCENT</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Min Max</td>
<td>Factory setting 0</td>
</tr>
</tbody>
</table>

Description: Sets the signal source for the wordwise data transfer (process signal). This signal value is available in CO: r8512 for further interconnection.

Dependency: Refer to: r8512

<table>
<thead>
<tr>
<th>p8503</th>
<th>CI: Data transfer 1 wordwise / Transfer 1 word</th>
</tr>
</thead>
<tbody>
<tr>
<td>CU_S110-CAN, CU_S110-DP, CU_S110-PN</td>
<td>Can be changed: U, T Calculated: - Access level: 2</td>
</tr>
<tr>
<td>Data type: Unsigned32 / Integer32 Dynamic index: -</td>
<td>Func. diagram: -</td>
</tr>
<tr>
<td>P-Group: - Units group: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type: - Scaling: PERCENT</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Min Max</td>
<td>Factory setting 0</td>
</tr>
</tbody>
</table>

Description: Sets the signal source for the wordwise data transfer (process signal). This signal value is available in CO: r8513 for further interconnection.

Dependency: Refer to: r8513

<table>
<thead>
<tr>
<th>p8504</th>
<th>CI: Data transfer 2 wordwise / Transfer 2 word</th>
</tr>
</thead>
<tbody>
<tr>
<td>CU_S110-CAN, CU_S110-DP, CU_S110-PN</td>
<td>Can be changed: U, T Calculated: - Access level: 2</td>
</tr>
<tr>
<td>Data type: Unsigned32 / Integer32 Dynamic index: -</td>
<td>Func. diagram: -</td>
</tr>
<tr>
<td>P-Group: - Units group: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type: - Scaling: PERCENT</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Min Max</td>
<td>Factory setting 0</td>
</tr>
</tbody>
</table>

Description: Sets the signal source for the wordwise data transfer (process signal). This signal value is available in CO: r8514 for further interconnection.

Dependency: Refer to: r8514

<table>
<thead>
<tr>
<th>p8505</th>
<th>CI: Data transfer 3 wordwise / Transfer 3 word</th>
</tr>
</thead>
<tbody>
<tr>
<td>CU_S110-CAN, CU_S110-DP, CU_S110-PN</td>
<td>Can be changed: U, T Calculated: - Access level: 2</td>
</tr>
<tr>
<td>Data type: Unsigned32 / Integer32 Dynamic index: -</td>
<td>Func. diagram: -</td>
</tr>
<tr>
<td>P-Group: - Units group: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type: - Scaling: PERCENT</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Min Max</td>
<td>Factory setting 0</td>
</tr>
</tbody>
</table>

Description: Sets the signal source for the wordwise data transfer (process signal). This signal value is available in CO: r8515 for further interconnection.

Dependency: Refer to: r8515
### List of parameters

#### Parameter: r8510.0...7

**BO: Data transfer 0 receive bitwise / Trans 0 recv bit**

<table>
<thead>
<tr>
<th>CU_S110-CAN, CU_S110-DP, CU_S110-PN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed: - Calculated: - Access level: 2</td>
</tr>
<tr>
<td>Data type: Unsigned32 Dynamic index: - Func. diagram: -</td>
</tr>
<tr>
<td>P-Group: - Units group: - Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type: - Scaling: - Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
</tr>
</tbody>
</table>

**Dependency:**
Refer to: p8500

**Description:**
Displays the signals of the bitwise received data. These signals were interconnected and transferred via BI: p8500[0...7].

**Bit field:**

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Receive signal from BI: p8500</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>01</td>
<td>Receive signal from BI: p8500</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>02</td>
<td>Receive signal from BI: p8500</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>03</td>
<td>Receive signal from BI: p8500</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>04</td>
<td>Receive signal from BI: p8500</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>05</td>
<td>Receive signal from BI: p8500</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>06</td>
<td>Receive signal from BI: p8500</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>07</td>
<td>Receive signal from BI: p8500</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
</tbody>
</table>

#### Parameter: r8511.0...21

**BO: Data transfer 1 receive bitwise / Trans 1 recv bit**

<table>
<thead>
<tr>
<th>CU_S110-CAN, CU_S110-DP, CU_S110-PN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed: - Calculated: - Access level: 2</td>
</tr>
<tr>
<td>Data type: Unsigned32 Dynamic index: - Func. diagram: -</td>
</tr>
<tr>
<td>P-Group: - Units group: - Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type: - Scaling: - Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
</tr>
</tbody>
</table>

**Dependency:**
Refer to: p8501

**Description:**
Displays the signals of the bitwise received data. These signals were interconnected and transferred via BI: p8501[0...15].

**Bit field:**

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Receive signal from BI: p8501</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>01</td>
<td>Receive signal from BI: p8501</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>02</td>
<td>Receive signal from BI: p8501</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>03</td>
<td>Receive signal from BI: p8501</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>04</td>
<td>Receive signal from BI: p8501</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>05</td>
<td>Receive signal from BI: p8501</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>06</td>
<td>Receive signal from BI: p8501</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>07</td>
<td>Receive signal from BI: p8501</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>08</td>
<td>Receive signal from BI: p8501</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>09</td>
<td>Receive signal from BI: p8501</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>10</td>
<td>Receive signal from BI: p8501</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>11</td>
<td>Receive signal from BI: p8501</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>12</td>
<td>Receive signal from BI: p8501</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>13</td>
<td>Receive signal from BI: p8501</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>14</td>
<td>Receive signal from BI: p8501</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>15</td>
<td>Receive signal from BI: p8501</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>16</td>
<td>Receive signal from BI: p8501</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>17</td>
<td>Receive signal from BI: p8501</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>18</td>
<td>Receive signal from BI: p8501</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>19</td>
<td>Receive signal from BI: p8501</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>20</td>
<td>Receive signal from BI: p8501</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
<tr>
<td>21</td>
<td>Receive signal from BI: p8501</td>
<td>ON</td>
<td>OFF</td>
<td>-</td>
</tr>
</tbody>
</table>
### r8512

**CO: Data transfer 0 receive wordwise / Trans 0 recv word**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Access level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>Calculated</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Data type</td>
<td>FloatingPoint32</td>
<td></td>
</tr>
<tr>
<td>Dynamic index</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>P-Group</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Units group</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Not for motor type</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Scaling</td>
<td>PERCENT</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>- [%]</td>
<td></td>
</tr>
<tr>
<td>Max</td>
<td>- [%]</td>
<td></td>
</tr>
<tr>
<td>Expert list</td>
<td>Factory setting</td>
<td>1</td>
</tr>
<tr>
<td>Factory setting</td>
<td>- [%]</td>
<td></td>
</tr>
</tbody>
</table>

**Description:**
Displays the signals of the wordwise received data (process signal). This signal value is interconnected and transferred via CI: p8502.

**Dependency:**
Refer to: p8502

---

### r8513

**CO: Data transfer 1 receive wordwise / Trans 1 recv word**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Access level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>Calculated</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Data type</td>
<td>FloatingPoint32</td>
<td></td>
</tr>
<tr>
<td>Dynamic index</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>P-Group</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Units group</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Not for motor type</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Scaling</td>
<td>PERCENT</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>- [%]</td>
<td></td>
</tr>
<tr>
<td>Max</td>
<td>- [%]</td>
<td></td>
</tr>
<tr>
<td>Expert list</td>
<td>Factory setting</td>
<td>1</td>
</tr>
<tr>
<td>Factory setting</td>
<td>- [%]</td>
<td></td>
</tr>
</tbody>
</table>

**Description:**
Displays the signals of the wordwise received data (process signal). This signal value is interconnected and transferred via CI: p8503.

**Dependency:**
Refer to: p8503

---

### r8514

**CO: Data transfer 2 receive wordwise / Trans 2 recv word**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Access level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>Calculated</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Data type</td>
<td>FloatingPoint32</td>
<td></td>
</tr>
<tr>
<td>Dynamic index</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>P-Group</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Units group</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Not for motor type</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Scaling</td>
<td>PERCENT</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>- [%]</td>
<td></td>
</tr>
<tr>
<td>Max</td>
<td>- [%]</td>
<td></td>
</tr>
<tr>
<td>Expert list</td>
<td>Factory setting</td>
<td>1</td>
</tr>
<tr>
<td>Factory setting</td>
<td>- [%]</td>
<td></td>
</tr>
</tbody>
</table>

**Description:**
Displays the signals of the wordwise received data (process signal). This signal value is interconnected and transferred via CI: p8504.

**Dependency:**
Refer to: p8504

---

### r8515

**CO: Data transfer 3 receive wordwise / Trans 3 recv word**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Access level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>Calculated</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Data type</td>
<td>FloatingPoint32</td>
<td></td>
</tr>
<tr>
<td>Dynamic index</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>P-Group</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Units group</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Not for motor type</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Scaling</td>
<td>PERCENT</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>- [%]</td>
<td></td>
</tr>
<tr>
<td>Max</td>
<td>- [%]</td>
<td></td>
</tr>
<tr>
<td>Expert list</td>
<td>Factory setting</td>
<td>1</td>
</tr>
<tr>
<td>Factory setting</td>
<td>- [%]</td>
<td></td>
</tr>
</tbody>
</table>

**Description:**
Displays the signals of the wordwise received data (process signal). This signal value is interconnected and transferred via CI: p8505.

**Dependency:**
Refer to: p8505
### List of parameters

#### Parameter 1-497© Siemens AG 2012 All Rights Reserved

**SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>p8550 AOP LOCAL/REMOTE / AOP LOCAL/REMOTE</td>
<td>Setting for saving the actual configuration of the Advanced Operator Panel (AOP).</td>
</tr>
<tr>
<td>CU_S110-CAN, CU_S110-DP, CU_S110-PN</td>
<td>Can be changed: U, T Calculated: - Access level: 4</td>
</tr>
<tr>
<td>Data type: Unsigned32 Dynamic index: - Func. diagram: -</td>
<td></td>
</tr>
<tr>
<td>P-Group: - Units group: - Unit selection: -</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: - Scaling: - Expert list: 1</td>
<td></td>
</tr>
<tr>
<td>Min Max Factory setting</td>
<td></td>
</tr>
<tr>
<td>- - 0000 0000 0000 1001 bin</td>
<td></td>
</tr>
<tr>
<td>Bit field: Bit Signal name</td>
<td>1 signal 0 signal FP</td>
</tr>
<tr>
<td>00 LOCAL save</td>
<td>Yes No -</td>
</tr>
<tr>
<td>01 Start in LOCAL</td>
<td>Yes No -</td>
</tr>
<tr>
<td>02 Change in oper.</td>
<td>Yes No -</td>
</tr>
<tr>
<td>03 OFF acts like OFF1</td>
<td>Yes No -</td>
</tr>
<tr>
<td>04 OFF acts like OFF2</td>
<td>Yes No -</td>
</tr>
<tr>
<td>05 OFF acts like OFF3</td>
<td>Yes No -</td>
</tr>
<tr>
<td>06 Reserved</td>
<td>Yes No -</td>
</tr>
<tr>
<td>07 CW/CCW active</td>
<td>Yes No -</td>
</tr>
<tr>
<td>08 Jog active</td>
<td>Yes No -</td>
</tr>
<tr>
<td>09 Save speed setpoint</td>
<td>Yes No -</td>
</tr>
<tr>
<td>14 Inhibit operation</td>
<td>Yes No -</td>
</tr>
<tr>
<td>15 Inhibit parameterization</td>
<td>Yes No -</td>
</tr>
</tbody>
</table>

#### Parameter r8571[0...39] Macro Binector Input (BI) / Macro BI

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Displays the ACX file saved in the appropriate directory in the non-volatile memory.</td>
</tr>
<tr>
<td>Can be changed: - Calculated: - Access level: 1</td>
<td></td>
</tr>
<tr>
<td>Data type: Unsigned32 Dynamic index: - Func. diagram: -</td>
<td></td>
</tr>
<tr>
<td>P-Group: - Units group: - Unit selection: -</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: - Scaling: - Expert list: 0</td>
<td></td>
</tr>
<tr>
<td>Min Max Factory setting</td>
<td></td>
</tr>
<tr>
<td>- -</td>
<td></td>
</tr>
</tbody>
</table>

#### Parameter r8572[0...39] Macro Connector Inputs (CI) for speed setpoints / Macro CI n_set

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Displays the ACX file saved in the appropriate directory in the non-volatile memory.</td>
</tr>
<tr>
<td>Can be changed: - Calculated: - Access level: 1</td>
<td></td>
</tr>
<tr>
<td>Data type: Unsigned32 Dynamic index: - Func. diagram: -</td>
<td></td>
</tr>
<tr>
<td>P-Group: - Units group: - Unit selection: -</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: - Scaling: - Expert list: 0</td>
<td></td>
</tr>
<tr>
<td>Min Max Factory setting</td>
<td></td>
</tr>
<tr>
<td>- -</td>
<td></td>
</tr>
</tbody>
</table>

#### Parameter r8573[0...39] Macro Connector Inputs (CI) for torque setpoints / Macro CI M_set

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Displays the ACX file saved in the appropriate directory in the non-volatile memory.</td>
</tr>
<tr>
<td>Can be changed: - Calculated: - Access level: 1</td>
<td></td>
</tr>
<tr>
<td>Data type: Unsigned32 Dynamic index: - Func. diagram: -</td>
<td></td>
</tr>
<tr>
<td>P-Group: - Units group: - Unit selection: -</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: - Scaling: - Expert list: 0</td>
<td></td>
</tr>
<tr>
<td>Min Max Factory setting</td>
<td></td>
</tr>
<tr>
<td>- -</td>
<td></td>
</tr>
</tbody>
</table>
### r8600 CAN device type / Device type

**CU_S110-CAN**

<table>
<thead>
<tr>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level: 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be:</td>
<td>Calculated:</td>
<td></td>
</tr>
<tr>
<td>Dynamic index:</td>
<td>Dynamic index:</td>
<td></td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>Not for motor type:</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Displays all of the devices connected to the CAN bus after run-up.

- **r8600**
  - = 00000000 hex: No drive recognized.
  - = 00020192 hex: 1 Servo drive

**Note:** Corresponds to the CANopen object 1000 hex.

For each detected drive, the device type is displayed in object 67FF hex.

### r8601 CAN error register / Error register

**CU_S110-CAN**

<table>
<thead>
<tr>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level: 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be:</td>
<td>Calculated:</td>
<td></td>
</tr>
<tr>
<td>Dynamic index:</td>
<td>Dynamic index:</td>
<td></td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>Not for motor type:</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Displays the error register for CANopen.

- Bit 0: Generic error
  - 0 signal: No error present.
  - 1 signal: Generic error present.
- Bit 1 ... 3: Not supported (always a 0 signal)
- Bit 4: Communications error
  - 0 signal: There is no message in the range 8700 ... 8799.
  - 1 signal: There is at least one message (fault or alarm) in the range 8700 ... 8799.
- Bit 5 ... 6: Not supported (always a 0 signal)
- Bit 7: Fault outside the range 8700 ... 8799
  - 0 signal: There is no fault outside the range 8700 ... 8799.
  - 1 signal: There is at least one fault outside the range 8700 ... 8799.

**Note:** Corresponds to the CANopen object 1001 hex.

### p8602 CAN SYNC object / SYNC object

**CU_S110-CAN**

<table>
<thead>
<tr>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level: 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be:</td>
<td>Calculated:</td>
<td></td>
</tr>
<tr>
<td>Dynamic index:</td>
<td>Dynamic index:</td>
<td></td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>Not for motor type:</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Sets the SYNC object parameter for the following CANopen objects:

- = 1005 hex: COB-ID

**Note:**

- SINAMICS operates as SYNC load.
- COB-ID: CAN object identification
### Parameter List

#### CAN COB-ID Emergency Message / COB-ID EMCY Msg

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Data type</th>
<th>Dynamic index</th>
<th>Units group</th>
<th>Unit selection</th>
<th>Expert list</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p8603</td>
<td>Sets the COB-ID for the emergency message (error telegram).</td>
<td>Unsigned32</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>0000 hex</td>
</tr>
<tr>
<td></td>
<td>It corresponds to the CANopen objects:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- 1014 hex: COB-ID</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Online, the value 0 is rejected as, according to the CANopen Standard, COB-ID 0 is not permitted here. The changeover of the node ID using the hardware switch at the Control Unit or per software has no effect on the COB-ID EMCY. The saved value remains effective.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### CAN node guarding / Node guarding

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Data type</th>
<th>Dynamic index</th>
<th>Units group</th>
<th>Unit selection</th>
<th>Expert list</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p8604[0...1]</td>
<td>Sets the node guarding parameter for the following CANopen objects:</td>
<td>Unsigned16</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>- 100C hex: Guard Time</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- 100D hex: Life Time Factor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The life time is derived by multiplying guard time by the life time factor.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Index:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0] = Time interval [ms] for new node guarding telegram</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[1] = Factor for failure of the node guarding telegram</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dependency:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Only adjustable if heartbeat time = 0 (heartbeat is disabled).</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Refer to: p8606</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Note: Adamson</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>For p8604[0] = 0 and/or p8604[1] = 0, the node guarding protocol is not used. Either node guarding or heartbeat can be used.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### CAN Producer Heartbeat Time / Prod Heartb Time

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Data type</th>
<th>Dynamic index</th>
<th>Units group</th>
<th>Unit selection</th>
<th>Expert list</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p8606</td>
<td>Sets the time [ms] to cyclically send heartbeat telegrams.</td>
<td>Unsigned16</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>0 [ms]</td>
</tr>
<tr>
<td></td>
<td>The smallest cycle time is 100 ms.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>When a 0 is written, then heartbeat telegrams are not sent.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dependency:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Only adjustable if guard time = 0 (node guarding disabled).</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Refer to: p8604</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Note:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Corresponds to the CANopen object 1017 hex.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Either node guarding or heartbeat can be used.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### r8607[0...3] CAN Identity Object / Identity object

<table>
<thead>
<tr>
<th>CU_S110-CAN</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

**Data type:** Unsigned32  
**Dynamic index:** -  
**Func. diagram:** -  
**P-Group:** Communications  
**Units group:** -  
**Unit selection:** -  
**Not for motor type:** -  
**Scaling:** -  
**Expert list:** 1  
**Min:** -  
**Max:** -  
**Factory setting:** -

**Description:** General device information display.

**Index:**
- [0] = Vendor ID
- [1] = Product code
- [2] = Revision number
- [3] = Serial number

**Note:**
Corresponds to the CANopen object 1018 hex.

Re index 3:
The SINAMICS serial number comprises 60 bits. Of these bits, the following are displayed in this index:

- Bits 0 ... 19: Consecutive number
- Bits 20 ... 23: Production ID
  - 0 hex: Development
  - 1 hex: P1 unique number
  - 2 hex: P2 unique number
  - 3 hex: WA unique number
  - 9 hex: Pattern
  - F hex: All others
- Bits 24 ... 27: Month of manufacture (0 means January, B means December)
- Bits 28 ... 31: Year of manufacture (0 means 2002)

### p8608[0...1] CAN Clear Bus Off Error / Clear bus off err

<table>
<thead>
<tr>
<th>CU_S110-CAN</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

**Data type:** Integer16  
**Dynamic index:** -  
**Func. diagram:** -  
**P-Group:** -  
**Units group:** -  
**Unit selection:** -  
**Not for motor type:** -  
**Scaling:** -  
**Expert list:** 1  
**Min:** 0  
**Max:** 1  
**Factory setting:** 0

**Description:** As a result of a Bus Off error, the CAN controller is set into the initialization state.

**Index 0:**
The CAN controller is manually started after resolving the cause of the error with p8608[0] = 1

**Index 1:**
At 2 second intervals, the CAN controller is automatically restarted until the cause of the error has been resolved and a CAN connection has been established.

**Value:**
- 0: Inactive
- 1: Start CAN controller

**Index:**
- [0] = Manual controller start function
- [1] = Activating the automatic controller start function

**Note:**
This parameter is automatically reset to 0 after start.
### p8609[0...1] CAN Error Behavior / Error behavior

| CU_S110-CAN | **Data type:** Integer16 | **Value:** 0: Pre-operational, 1: No change, 2: Stopped | **Index:** [0] = Behavior for communication errors, [1] = Behavior for device faults |

**Description:** Sets the behavior of the CAN node referred to the communications error or equipment fault.

**Note:** Corresponds to the CANopen object 1029 hex.

### r8610[0...1] CAN First Server SDO / First server SDO

| CU_S110-CAN | **Data type:** Unsigned32 | **Value:** Displays the COB ID from client to server, [1] = Displays the COB ID from server to client |

**Description:** Displays the identifier (client/server and server/client) of the SDO channel.

**Note:** Corresponds to the CANopen object 1200 hex.

### p8611[0...82] CAN Pre-defined Error Field / Pre_def err field

| CU_S110-CAN | **Data type:** Unsigned32 | **Value:** Displays the Pre-defined Error Field of the CAN node. |

**Description:** Displays the Pre-defined Error Field of the CAN node. It includes the number of all errors that have occurred, the number of errors that have occurred for each drive and the errors according to their history. The first 16 bits represent the CANopen error code and the second 16 bits the SINAMICS error code. Index 1 has the same structure - however, the drive object ID is in the second 16 bits instead of the SINAMICS error code.

**CANopen error code:**
- 0000 hex: No error present
- 8110 hex: Alarm A08751 present
- 8120 hex: Alarm A08752 present
- 8130 hex: Alarm A08700(F) with alarm value = 2 present
- 1000 hex: Generic error 1 present (there is at least one fault outside the range 8700 ... 8799)
- 1001 hex: Generic error 2 present (there is at least one alarm in the range 8700 ... 8799 with the exception of A08751, A08752, A08700)

All drive objects are acknowledged by writing the value 0 to the index 0. As soon as a fault has been acknowledged or an alarm cleared, then it is also cleared from the fault list.
Index:

- [0] = Number of all faults in the drive unit
- [1] = Most recent drive number / fault number
- [2] = Number of faults drive 1
- [3] = Fault 1/ drive 1
- [4] = Fault 2/ drive 1
- [7] = Fault 5/ drive 1
- [8] = Fault 6/ drive 1
- [9] = Fault 7/ drive 1
- [10] = Fault 8/ drive 1
- [11] = Number of faults drive 2
- [12] = Fault 1/ drive 2
- [16] = Fault 5/ drive 2
- [17] = Fault 6/ drive 2
- [18] = Fault 7/ drive 2
- [19] = Fault 8/ drive 2
- [20] = Number of faults drive 3
- [21] = Fault 1/ drive 3
- [22] = Fault 2/ drive 3
- [23] = Fault 3/ drive 3
- [26] = Fault 6/ drive 3
- [27] = Fault 7/ drive 3
- [28] = Fault 8/ drive 3
- [29] = Number of faults drive 4
- [30] = Fault 1/ drive 4
- [31] = Fault 2/ drive 4
- [32] = Fault 3/ drive 4
- [33] = Fault 4/ drive 4
- [34] = Fault 5/ drive 4
- [35] = Fault 6/ drive 4
- [36] = Fault 7/ drive 4
- [37] = Fault 8/ drive 4
- [38] = Number of faults drive 5
- [39] = Fault 1/ drive 5
- [40] = Fault 2/ drive 5
- [41] = Fault 3/ drive 5
- [42] = Fault 4/ drive 5
- [43] = Fault 5/ drive 5
- [44] = Fault 6/ drive 5
- [45] = Fault 7/ drive 5
- [46] = Fault 8/ drive 5
- [47] = Number of faults drive 6
- [48] = Fault 1/ drive 6
- [49] = Fault 2/ drive 6
- [50] = Fault 3/ drive 6
- [51] = Fault 4/ drive 6
- [52] = Fault 5/ drive 6
- [53] = Fault 6/ drive 6
- [54] = Fault 7/ drive 6
- [55] = Fault 8/ drive 6
- [56] = Number of faults drive 7
- [57] = Fault 1/ drive 7
- [58] = Fault 2/ drive 7
- [59] = Fault 3/ drive 7
- [60] = Fault 4/ drive 7
- [61] = Fault 5/ drive 7
- [63] = Fault 7/ drive 7
[64] = Fault 8/ drive 7  
[65] = Number of faults drive 8  
[66] = Fault 1/ drive 8  
[67] = Fault 2/ drive 8  
[68] = Fault 3/ drive 8  
[69] = Fault 4/ drive 8  
[70] = Fault 5/ drive 8  
[71] = Fault 6/ drive 8  
[72] = Fault 7/ drive 8  
[73] = Fault 8/ drive 8  
[74] = Number of faults Control Unit  
[75] = Fault 1/Control Unit  
[76] = Fault 2/Control Unit  
[77] = Fault 3/Control Unit  
[78] = Fault 4/Control Unit  
[79] = Fault 5/Control Unit  
[80] = Fault 6/Control Unit  
[81] = Fault 7/Control Unit  
[82] = Fault 8/Control Unit  

Note:  
Corresponds to the CANopen object 1003 hex.

<table>
<thead>
<tr>
<th><strong>p8620</strong></th>
<th>CAN Node-ID / Node ID</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CU_S110-CAN</strong></td>
<td>Can be changed: T</td>
</tr>
<tr>
<td></td>
<td>Calculated: -</td>
</tr>
<tr>
<td></td>
<td>Access level: 2</td>
</tr>
<tr>
<td>Data type:</td>
<td>Unsigned8</td>
</tr>
<tr>
<td>Dynamic index:</td>
<td>-</td>
</tr>
<tr>
<td>P-Group:</td>
<td>-</td>
</tr>
<tr>
<td>Units group:</td>
<td>-</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
</tr>
<tr>
<td>Scaling:</td>
<td>-</td>
</tr>
<tr>
<td>Expert list:</td>
<td>1</td>
</tr>
<tr>
<td>Min</td>
<td>1</td>
</tr>
<tr>
<td>Max</td>
<td>127</td>
</tr>
<tr>
<td>Factory setting</td>
<td>-</td>
</tr>
</tbody>
</table>

Description:  
Display or setting of the CANopen Node ID.  
The Node ID can be set as follows:  
1) Using the address switch on the Control Unit.  
--> p8620 can then only be read and displays the selected Node ID.  
--> A change only becomes effective after a POWER ON.  
--> CANopen Node ID and PROFIBUS address are identical.  
2) Using p8620  
--> Only if address 0 is set using the address switch.  
--> the Node ID is set as standard to 126.  
--> A change only becomes effective after save and POWER ON.

Dependency:  
Refer to: r8621  
Note:  
Every node ID change only becomes effective after a POWER ON.  
The active node ID is displayed in r8621.  
The parameter is not influenced by setting the factory setting.  
It is only possible to independently set CANopen node ID and the PROFIBUS address using p0918 and p8620 (pre-requisite: the address 0 is set for the address switch).

<table>
<thead>
<tr>
<th><strong>r8621</strong></th>
<th>CAN Node-ID active / Node ID active</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CU_S110-CAN</strong></td>
<td>Can be changed: -</td>
</tr>
<tr>
<td></td>
<td>Calculated: -</td>
</tr>
<tr>
<td></td>
<td>Access level: 3</td>
</tr>
<tr>
<td>Data type:</td>
<td>Unsigned8</td>
</tr>
<tr>
<td>Dynamic index:</td>
<td>-</td>
</tr>
<tr>
<td>P-Group:</td>
<td>Communications</td>
</tr>
<tr>
<td>Units group:</td>
<td>-</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
</tr>
<tr>
<td>Scaling:</td>
<td>-</td>
</tr>
<tr>
<td>Expert list:</td>
<td>1</td>
</tr>
<tr>
<td>Min</td>
<td>-</td>
</tr>
<tr>
<td>Max</td>
<td>-</td>
</tr>
<tr>
<td>Factory setting</td>
<td>-</td>
</tr>
</tbody>
</table>

Description:  
Displays the active CANopen Node ID.

Dependency:  
Refer to: p8620
### p8622 CAN bit rate / Bit rate

<table>
<thead>
<tr>
<th>Description</th>
<th>Setting the bit rate for the CAN bus. The appropriate bit timings are selected that are defined in p8623 in the associated sub-index.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Example</td>
<td>Bit rate = 20 kbit/s --&gt; p8622 = 6 --&gt; associated bit timing is in p8623[6].</td>
</tr>
</tbody>
</table>
| Value      | 0: 1 Mbit/s  
                1: 800 kbit/s  
                2: 500 kbit/s  
                3: 250 kbit/s  
                4: 125 kbit/s  
                5: 50 kbit/s  
                6: 20 kbit/s  
                7: 10 kbit/s |
| Dependency | Refer to: p8623 |
| Note       | The parameter is not influenced by setting the factory setting. |

### p8623[0...7] CAN Bit Timing selection / Bit timing select

| Description | Sets the bit timing for the C_CAN controller to the associated and selected bit rate (p8622). Bits are distributed to the following parameters of the C_CAN controller in p8623[0...7]:  
  Bit 0 ... 5: BRP (Baud Rate Prescaler)  
  Bit 6 ... 7: SJW (Synchronization Jump Width)  
  Bit 8 ... 11: TSEG1 (Time Segment 1, before the sampling point)  
  Bit 12 ... 14: TSEG2 (Time Segment 2, after the sampling point)  
  Bit 15: Reserved  
  Bit 16 ... 19: BRPE (Baud Rate Prescaler Extension)  
  Bit 20 ... 31: Reserved |
| Index       | Use the factory setting when setting the bit timing. |
| Recommendation | Bit rate = 20 kbit/s --> p8622 = 6 --> associated bit timing is in p8623[6] --> 0001 2FB6 |

| Value       | 0000 hex  
                000F 7FFF hex  
                0105 hex  
                010B 7FFF hex  
                0117 hex  
                0135 hex  
                013B hex  
                0002 1C15 hex  
                0004 1C2B hex |
| Dynamic index | [0] 1405 hex  
                [1] 1605 hex  
                [2] 1C05 hex  
                [3] 1C0B hex  
                [4] 1C17 hex  
                [5] 1C3B hex  
                [6] 0002 1C15 hex  
                [7] 0004 1C2B hex |
[6] = 20 kbit/s
[7] = 10 kbit/s

Dependency:
Refer to: p8622

Note:
The parameter is not influenced by setting the factory setting.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>List of parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>p8630[0...2]</td>
<td>CAN virtual objects / Virtual objects</td>
</tr>
<tr>
<td>CU_S110-CAN</td>
<td>Can be changed: U, T Calculated: - Access level: 3</td>
</tr>
<tr>
<td>Data type: Unsigned16</td>
<td>Dynamic index: - Func. diagram: -</td>
</tr>
<tr>
<td>P-Group: Communications</td>
<td>Units group: - Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: - Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
<td>Max Factory setting</td>
</tr>
<tr>
<td>0</td>
<td>65535 0</td>
</tr>
</tbody>
</table>

Description:
Sets the drive object selection (index 0), the sub-index area (index 1) and the parameter area (index 2) when using virtual objects.

This means that it is possible to access all SINAMICS parameters via CAN.

Index 0 (drive object number):
0: Not possible to access virtual CANopen objects
1: Device
2 ... 65535: drive object number of drive 1 ... 8

Index 1 (sub-index area):
0: 0 ... 255
1: 256 ... 511
2: 512 ... 767
3: 768 ... 1023

Index 2 (parameter area):
0: 1 ... 9999
1: 10000 ... 19999
2: 20000 ... 29999
3: 30000 ... 39999

Index:
[0] = Drive object number
[1] = Sub-index range
[2] = Parameter range

<table>
<thead>
<tr>
<th>Parameter</th>
<th>List of parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>p8641</td>
<td>CAN Abort Connection Option Code / Abort con opt code</td>
</tr>
<tr>
<td>SERVO_S110-CAN</td>
<td>Can be changed: T Calculated: - Access level: 3</td>
</tr>
<tr>
<td>Data type: Integer16</td>
<td>Dynamic index: - Func. diagram: -</td>
</tr>
<tr>
<td>P-Group: -</td>
<td>Units group: - Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: - Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
<td>Max Factory setting</td>
</tr>
<tr>
<td>0</td>
<td>3 3</td>
</tr>
</tbody>
</table>

Description:
Sets the drive behavior if a CAN communication error occurs.

Value:
0: No response
1: OFF1
2: OFF2
3: OFF3

Dependency:
Refer to: F08700
## CAN Diagnosis Hardware / Diagnostics HW

<table>
<thead>
<tr>
<th>Index</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>[0]</td>
<td>Control register</td>
</tr>
<tr>
<td>[1]</td>
<td>Status register</td>
</tr>
<tr>
<td>[2]</td>
<td>Error counter</td>
</tr>
<tr>
<td>[3]</td>
<td>Bit timing register</td>
</tr>
<tr>
<td>[4]</td>
<td>Interrupt register</td>
</tr>
<tr>
<td>[5]</td>
<td>Test register</td>
</tr>
<tr>
<td>[6]</td>
<td>Baud rate prescaler extension register</td>
</tr>
<tr>
<td>[7]</td>
<td>Interface 1 command request register</td>
</tr>
<tr>
<td>[8]</td>
<td>Interface 1 command mask register</td>
</tr>
<tr>
<td>[9]</td>
<td>Interface 1 mask 1 register</td>
</tr>
<tr>
<td>[10]</td>
<td>Interface 1 mask 2 register</td>
</tr>
<tr>
<td>[11]</td>
<td>Interface 1 arbitration 1 register</td>
</tr>
<tr>
<td>[12]</td>
<td>Interface 1 arbitration 2 register</td>
</tr>
<tr>
<td>[13]</td>
<td>Interface 1 message control register</td>
</tr>
<tr>
<td>[14]</td>
<td>Interface 1 data A1 register</td>
</tr>
<tr>
<td>[15]</td>
<td>Interface 1 data A2 register</td>
</tr>
<tr>
<td>[16]</td>
<td>Interface 1 data B1 register</td>
</tr>
<tr>
<td>[17]</td>
<td>Interface 1 data B2 register</td>
</tr>
<tr>
<td>[18]</td>
<td>Interface 2 command request register</td>
</tr>
<tr>
<td>[19]</td>
<td>Interface 2 command mask register</td>
</tr>
<tr>
<td>[20]</td>
<td>Interface 2 mask 1 register</td>
</tr>
<tr>
<td>[21]</td>
<td>Interface 2 mask 2 register</td>
</tr>
<tr>
<td>[22]</td>
<td>Interface 2 arbitration 1 register</td>
</tr>
<tr>
<td>[23]</td>
<td>Interface 2 arbitration 2 register</td>
</tr>
<tr>
<td>[24]</td>
<td>Interface 2 message control register</td>
</tr>
<tr>
<td>[25]</td>
<td>Interface 2 data A1 register</td>
</tr>
<tr>
<td>[26]</td>
<td>Interface 2 data A2 register</td>
</tr>
<tr>
<td>[27]</td>
<td>Interface 2 data B1 register</td>
</tr>
<tr>
<td>[28]</td>
<td>Interface 2 data B2 register</td>
</tr>
<tr>
<td>[29]</td>
<td>Transmission request 1 register</td>
</tr>
<tr>
<td>[30]</td>
<td>Transmission request 2 register</td>
</tr>
<tr>
<td>[31]</td>
<td>New data 1 register</td>
</tr>
<tr>
<td>[32]</td>
<td>New data 2 register</td>
</tr>
<tr>
<td>[33]</td>
<td>Interrupt pending 1 register</td>
</tr>
<tr>
<td>[34]</td>
<td>Interrupt pending 2 register</td>
</tr>
<tr>
<td>[35]</td>
<td>Message valid 1 register</td>
</tr>
<tr>
<td>[36]</td>
<td>Message valid 2 register</td>
</tr>
</tbody>
</table>

**Description:**
Displays the register of the CAN controller C_CAN:
Register, Message Interface Register and Message Handler Register - referred to the CAN protocol.

## CAN NMT state after booting / NMT state aft boot

<table>
<thead>
<tr>
<th>Index</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>[0]</td>
<td>Control register</td>
</tr>
<tr>
<td>[1]</td>
<td>Status register</td>
</tr>
<tr>
<td>[2]</td>
<td>Error counter</td>
</tr>
<tr>
<td>[3]</td>
<td>Bit timing register</td>
</tr>
<tr>
<td>[4]</td>
<td>Interrupt register</td>
</tr>
<tr>
<td>[5]</td>
<td>Test register</td>
</tr>
<tr>
<td>[6]</td>
<td>Baud rate prescaler extension register</td>
</tr>
<tr>
<td>[7]</td>
<td>Interface 1 command request register</td>
</tr>
<tr>
<td>[8]</td>
<td>Interface 1 command mask register</td>
</tr>
<tr>
<td>[9]</td>
<td>Interface 1 mask 1 register</td>
</tr>
<tr>
<td>[10]</td>
<td>Interface 1 mask 2 register</td>
</tr>
<tr>
<td>[11]</td>
<td>Interface 1 arbitration 1 register</td>
</tr>
<tr>
<td>[12]</td>
<td>Interface 1 arbitration 2 register</td>
</tr>
<tr>
<td>[13]</td>
<td>Interface 1 message control register</td>
</tr>
<tr>
<td>[14]</td>
<td>Interface 1 data A1 register</td>
</tr>
<tr>
<td>[15]</td>
<td>Interface 1 data A2 register</td>
</tr>
<tr>
<td>[16]</td>
<td>Interface 1 data B1 register</td>
</tr>
<tr>
<td>[17]</td>
<td>Interface 1 data B2 register</td>
</tr>
<tr>
<td>[18]</td>
<td>Interface 2 command request register</td>
</tr>
<tr>
<td>[19]</td>
<td>Interface 2 command mask register</td>
</tr>
<tr>
<td>[20]</td>
<td>Interface 2 mask 1 register</td>
</tr>
<tr>
<td>[21]</td>
<td>Interface 2 mask 2 register</td>
</tr>
<tr>
<td>[22]</td>
<td>Interface 2 arbitration 1 register</td>
</tr>
<tr>
<td>[23]</td>
<td>Interface 2 arbitration 2 register</td>
</tr>
<tr>
<td>[24]</td>
<td>Interface 2 message control register</td>
</tr>
<tr>
<td>[25]</td>
<td>Interface 2 data A1 register</td>
</tr>
<tr>
<td>[26]</td>
<td>Interface 2 data A2 register</td>
</tr>
<tr>
<td>[27]</td>
<td>Interface 2 data B1 register</td>
</tr>
<tr>
<td>[28]</td>
<td>Interface 2 data B2 register</td>
</tr>
<tr>
<td>[29]</td>
<td>Transmission request 1 register</td>
</tr>
<tr>
<td>[30]</td>
<td>Transmission request 2 register</td>
</tr>
<tr>
<td>[31]</td>
<td>New data 1 register</td>
</tr>
<tr>
<td>[32]</td>
<td>New data 2 register</td>
</tr>
<tr>
<td>[33]</td>
<td>Interrupt pending 1 register</td>
</tr>
<tr>
<td>[34]</td>
<td>Interrupt pending 2 register</td>
</tr>
<tr>
<td>[35]</td>
<td>Message valid 1 register</td>
</tr>
<tr>
<td>[36]</td>
<td>Message valid 2 register</td>
</tr>
</tbody>
</table>

**Description:**
Sets the CANopen NMT state that is effective after booting.
Value: 4: Stopped
5: Operational
127: Pre-operational

Dependency: Refer to: p8685

Note: Booting in the NMT state pre-operational corresponds to the CANopen standard

---

### p8685 CAN NMT states / NMT states

<table>
<thead>
<tr>
<th>CU_S110-CAN</th>
<th>Can be changed: U, T</th>
<th>Calculated: -</th>
<th>Access level: 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type: Integer16 Dynamic index: - Func. diagram: -</td>
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<td></td>
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</tr>
<tr>
<td>P-Group: Communications Units group: - Unit selection: -</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type: - Scaling: - Expert list: 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>129</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factory setting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>127</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Description: Sets and displays the CANopen NMT state.

Value:
0: Initializing
4: Stopped
5: Operational
127: Pre-operational
128: Reset node
129: Reset Communication

Note: The value 0 (initialization) is only displayed and cannot be set.

---

### p8699 CAN: RPDO monitoring time / RPDO t_monit

<table>
<thead>
<tr>
<th>CU_S110-CAN</th>
<th>Can be changed: U, T</th>
<th>Calculated: -</th>
<th>Access level: 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type: FloatingPoint32 Dynamic index: - Func. diagram: -</td>
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</tr>
<tr>
<td>P-Group: Communications Units group: - Unit selection: -</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type: - Scaling: - Expert list: 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 [ms]</td>
<td>65535000 [ms]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factory setting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 [ms]</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Description: Sets the monitoring time to monitor the process data received via the CAN bus.
A value that is not a multiple integer of CANopen (p2048) is rounded-off.
If no process data is received within this time, fault F08702 is output.

Dependency: Refer to: p2048
Refer to: F08702

Note: 0: The monitoring is de-activated.

---

### p8700[0...1] CAN Receive PDO 1 / Receive PDO 1

<table>
<thead>
<tr>
<th>SERVO_S110-CAN</th>
<th>Can be changed: C1(3), T</th>
<th>Calculated: -</th>
<th>Access level: 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type: Unsigned32 Dynamic index: - Func. diagram: 9204, 9206</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P-Group: Communications Units group: - Unit selection: -</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type: - Scaling: - Expert list: 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0000 hex</td>
<td>8000 06DF hex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factory setting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[0] 8000 06DF hex</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[1] 00FE hex</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Description: Sets the communication parameters for CANopen Receive Process Data Object 1 (RPDO 1).

Index:

- [0] = PDO COB-ID
- [1] = PDO transmission type

Dependency: A valid COB-ID can only be set for the available (existing) channel.

Refer to: p8741

Note:
Corresponds to the CANopen object 1400 hex + 40 hex * x (x: Drive number 0 ... 7).
Transmission types 0, 1, FE and FF can be set.
PDO: Process Data Object
### CAN Receive PDO 2 / Receive PDO 2

**Parameter:**

**List of parameters**

<table>
<thead>
<tr>
<th>p8701[0...1]</th>
<th>CAN Receive PDO 2 / Receive PDO 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN</td>
<td>Can be changed: C1(3), T</td>
</tr>
<tr>
<td>Data type:</td>
<td>Calculated: -</td>
</tr>
<tr>
<td>Dynamic index:</td>
<td>Access level: 3</td>
</tr>
<tr>
<td>P-Group:</td>
<td>Unsigned32</td>
</tr>
<tr>
<td>Units group:</td>
<td>Dynamic index: -</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Min</td>
<td>Calculated: -</td>
</tr>
<tr>
<td>Max</td>
<td>Access level: 3</td>
</tr>
<tr>
<td>0000 hex</td>
<td>Dynamic index: -</td>
</tr>
<tr>
<td>8000 06DF hex</td>
<td>Unit selection: -</td>
</tr>
</tbody>
</table>

### Description:
Sets the communication parameters for CANopen Receive Process Data Object 2 (RPDO 2).

### Index:
- [0] = PDO COB-ID
- [1] = PDO transmission type

### Dependency:
A valid COB-ID can only be set for the available (existing) channel.

### Note:
Corresponds to the CANopen object 1401 hex + 40 hex * x (x: Drive number 0 ... 7). Transmission types 0, 1, FE and FF can be set.

PDO: Process Data Object

### CAN Receive PDO 3 / Receive PDO 3

<table>
<thead>
<tr>
<th>p8702[0...1]</th>
<th>CAN Receive PDO 3 / Receive PDO 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN</td>
<td>Can be changed: C1(3), T</td>
</tr>
<tr>
<td>Data type:</td>
<td>Calculated: -</td>
</tr>
<tr>
<td>Dynamic index:</td>
<td>Access level: 3</td>
</tr>
<tr>
<td>P-Group:</td>
<td>Unsigned32</td>
</tr>
<tr>
<td>Units group:</td>
<td>Dynamic index: -</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Min</td>
<td>Calculated: -</td>
</tr>
<tr>
<td>Max</td>
<td>Access level: 3</td>
</tr>
<tr>
<td>0000 hex</td>
<td>Dynamic index: -</td>
</tr>
<tr>
<td>8000 06DF hex</td>
<td>Unit selection: -</td>
</tr>
</tbody>
</table>

### Description:
Sets the communication parameters for CANopen Receive Process Data Object 3 (RPDO 3).

### Index:
- [0] = PDO COB-ID
- [1] = PDO transmission type

### Dependency:
A valid COB-ID can only be set for the available (existing) channel.

### Note:
Corresponds to the CANopen object 1402 hex + 40 hex * x (x: Drive number 0 ... 7). Transmission types 0, 1, FE and FF can be set.

PDO: Process Data Object

### CAN Receive PDO 4 / Receive PDO 4

<table>
<thead>
<tr>
<th>p8703[0...1]</th>
<th>CAN Receive PDO 4 / Receive PDO 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN</td>
<td>Can be changed: C1(3), T</td>
</tr>
<tr>
<td>Data type:</td>
<td>Calculated: -</td>
</tr>
<tr>
<td>Dynamic index:</td>
<td>Access level: 3</td>
</tr>
<tr>
<td>P-Group:</td>
<td>Unsigned32</td>
</tr>
<tr>
<td>Units group:</td>
<td>Dynamic index: -</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Min</td>
<td>Calculated: -</td>
</tr>
<tr>
<td>Max</td>
<td>Access level: 3</td>
</tr>
<tr>
<td>0000 hex</td>
<td>Dynamic index: -</td>
</tr>
<tr>
<td>8000 06DF hex</td>
<td>Unit selection: -</td>
</tr>
</tbody>
</table>

### Description:
Sets the communication parameters for CANopen Receive Process Data Object 4 (RPDO 4).

### Index:
- [0] = PDO COB-ID
- [1] = PDO transmission type

### Dependency:
A valid COB-ID can only be set for the available (existing) channel.

### Note:
Corresponds to the CANopen object 1403 hex + 40 hex * x (x: Drive number 0 ... 7). Transmission types 0, 1, FE and FF can be set.

PDO: Process Data Object
<table>
<thead>
<tr>
<th>Parameter</th>
<th>CAN Receive PDO 5 / Receive PDO 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN</td>
<td>CAN Receive PDO 5 / Receive PDO 5</td>
</tr>
<tr>
<td>Can be changed:</td>
<td>C1(3), T</td>
</tr>
<tr>
<td>Calculated:</td>
<td>-</td>
</tr>
<tr>
<td>Access level:</td>
<td>3</td>
</tr>
<tr>
<td>Data type:</td>
<td>Unsigned32</td>
</tr>
<tr>
<td>Dynamic index:</td>
<td>-</td>
</tr>
<tr>
<td>Func. diagram:</td>
<td>9204</td>
</tr>
<tr>
<td>P-Group:</td>
<td>Communications</td>
</tr>
<tr>
<td>Units group:</td>
<td>-</td>
</tr>
<tr>
<td>Unit selection:</td>
<td>-</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
</tr>
<tr>
<td>Scaling:</td>
<td>-</td>
</tr>
<tr>
<td>Expert list:</td>
<td>1</td>
</tr>
<tr>
<td>Min</td>
<td>0000 hex</td>
</tr>
<tr>
<td>Max</td>
<td>8000 06DF hex</td>
</tr>
<tr>
<td>Factory setting</td>
<td>[0] 8000 06DF hex</td>
</tr>
<tr>
<td></td>
<td>[1] 00FE hex</td>
</tr>
</tbody>
</table>

**Description:**
Sets the communication parameters for CANopen Receive Process Data Object 5 (RPDO 5).

**Index:**

- [0] = PDO COB-ID
- [1] = PDO transmission type

**Dependency:**
A valid COB-ID can only be set for the available (existing) channel.

**Note:**
Corresponds to the CANopen object 1404 hex + 40 hex * x (x: Drive number 0 ... 7).
Transmission types 0, 1, FE and FF can be set.

PDO: Process Data Object

<table>
<thead>
<tr>
<th>Parameter</th>
<th>CAN Receive PDO 6 / Receive PDO 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN</td>
<td>CAN Receive PDO 6 / Receive PDO 6</td>
</tr>
<tr>
<td>Can be changed:</td>
<td>C1(3), T</td>
</tr>
<tr>
<td>Calculated:</td>
<td>-</td>
</tr>
<tr>
<td>Access level:</td>
<td>3</td>
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<tr>
<td>Data type:</td>
<td>Unsigned32</td>
</tr>
<tr>
<td>Dynamic index:</td>
<td>-</td>
</tr>
<tr>
<td>Func. diagram:</td>
<td>9204</td>
</tr>
<tr>
<td>P-Group:</td>
<td>Communications</td>
</tr>
<tr>
<td>Units group:</td>
<td>-</td>
</tr>
<tr>
<td>Unit selection:</td>
<td>-</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
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<td>Scaling:</td>
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<td>Expert list:</td>
<td>1</td>
</tr>
<tr>
<td>Min</td>
<td>0000 hex</td>
</tr>
<tr>
<td>Max</td>
<td>8000 06DF hex</td>
</tr>
<tr>
<td>Factory setting</td>
<td>[0] 8000 06DF hex</td>
</tr>
<tr>
<td></td>
<td>[1] 00FE hex</td>
</tr>
</tbody>
</table>

**Description:**
Sets the communication parameters for CANopen Receive Process Data Object 6 (RPDO 6).

**Index:**

- [0] = PDO COB-ID
- [1] = PDO transmission type

**Dependency:**
A valid COB-ID can only be set for the available (existing) channel.

**Note:**
Corresponds to the CANopen object 1405 hex + 40 hex * x (x: Drive number 0 ... 7).
Transmission types 0, 1, FE and FF can be set.

PDO: Process Data Object

<table>
<thead>
<tr>
<th>Parameter</th>
<th>CAN Receive PDO 7 / Receive PDO 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN</td>
<td>CAN Receive PDO 7 / Receive PDO 7</td>
</tr>
<tr>
<td>Can be changed:</td>
<td>C1(3), T</td>
</tr>
<tr>
<td>Calculated:</td>
<td>-</td>
</tr>
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<tr>
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</tr>
<tr>
<td>Dynamic index:</td>
<td>-</td>
</tr>
<tr>
<td>Func. diagram:</td>
<td>9204</td>
</tr>
<tr>
<td>P-Group:</td>
<td>Communications</td>
</tr>
<tr>
<td>Units group:</td>
<td>-</td>
</tr>
<tr>
<td>Unit selection:</td>
<td>-</td>
</tr>
<tr>
<td>Not for motor type:</td>
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<td>Scaling:</td>
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<tr>
<td>Expert list:</td>
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<tr>
<td>Min</td>
<td>0000 hex</td>
</tr>
<tr>
<td>Max</td>
<td>8000 06DF hex</td>
</tr>
<tr>
<td>Factory setting</td>
<td>[0] 8000 06DF hex</td>
</tr>
<tr>
<td></td>
<td>[1] 00FE hex</td>
</tr>
</tbody>
</table>

**Description:**
Sets the communication parameters for CANopen Receive Process Data Object 7 (RPDO 7).

**Index:**

- [0] = PDO COB-ID
- [1] = PDO transmission type

**Dependency:**
A valid COB-ID can only be set for the available (existing) channel.

**Note:**
Corresponds to the CANopen object 1406 hex + 40 hex * x (x: Drive number 0 ... 7).
Transmission types 0, 1, FE and FF can be set.

PDO: Process Data Object
Parameter
List of parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>CAN Receive PDO 8 / Receive PDO 8</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>p8707[0...1]</strong></td>
<td><strong>CAN Receive PDO 8 / Receive PDO 8</strong></td>
</tr>
<tr>
<td>SERVO_S110-CAN</td>
<td>Can be changed: C1(3), T Calculated: - Access level: 3</td>
</tr>
<tr>
<td></td>
<td>Data type: Unsigned32 Dynamic index: - Func. diagram: 9204</td>
</tr>
<tr>
<td></td>
<td>P-Group: Communications Units group: - Unit selection: -</td>
</tr>
<tr>
<td></td>
<td>Not for motor type: - Scaling: - Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td>0000 hex</td>
<td>8000 06DF hex</td>
</tr>
<tr>
<td>Factory setting</td>
<td>[0] 8000 06DF hex [1] 00FE hex</td>
</tr>
</tbody>
</table>

Description: Sets the communication parameters for CANopen Receive Process Data Object 8 (RPDO 8).

Index:
- [0] = PDO COB-ID
- [1] = PDO transmission type

Dependency: A valid COB-ID can only be set for the available (existing) channel.

Refer to: p8741

Note: Corresponds to the CANopen object 1407 hex + 40 hex * x (x: Drive number 0 ... 7).
Transmission types 0, 1, FE and FF can be set.

PDO: Process Data Object

<table>
<thead>
<tr>
<th>Parameter</th>
<th>CAN Receive Mapping for RPDO 1 / Mapping RPDO 1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>p8710[0...3]</strong></td>
<td><strong>CAN Receive Mapping for RPDO 1 / Mapping RPDO 1</strong></td>
</tr>
<tr>
<td>SERVO_S110-CAN</td>
<td>Can be changed: C1(3), T Calculated: - Access level: 3</td>
</tr>
<tr>
<td></td>
<td>Data type: Unsigned32 Dynamic index: - Func. diagram: 9204, 9206</td>
</tr>
<tr>
<td></td>
<td>P-Group: Communications Units group: - Unit selection: -</td>
</tr>
<tr>
<td></td>
<td>Not for motor type: - Scaling: - Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td>0000 hex</td>
<td>FFFF FFFF hex</td>
</tr>
<tr>
<td>Factory setting</td>
<td>0000 hex</td>
</tr>
</tbody>
</table>

Description: Sets the mapping parameters for CANopen Receive Process Data Object 1 (RPDO 1).

Index:
- [0] = Mapped object 1
- [1] = Mapped object 2
- [3] = Mapped object 4

Note: Corresponds to the CANopen object 1600 hex + 40 hex * x (x: Drive number 0 ... 7).
Dummy mapping not supported.
The parameter can only be written online when the associated COB ID in p870x is set as invalid.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>CAN Receive Mapping for RPDO 2 / Mapping RPDO 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>p8711[0...3]</strong></td>
<td><strong>CAN Receive Mapping for RPDO 2 / Mapping RPDO 2</strong></td>
</tr>
<tr>
<td>SERVO_S110-CAN</td>
<td>Can be changed: C1(3), T Calculated: - Access level: 3</td>
</tr>
<tr>
<td></td>
<td>Data type: Unsigned32 Dynamic index: - Func. diagram: 9204, 9206</td>
</tr>
<tr>
<td></td>
<td>P-Group: Communications Units group: - Unit selection: -</td>
</tr>
<tr>
<td></td>
<td>Not for motor type: - Scaling: - Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td>0000 hex</td>
<td>FFFF FFFF hex</td>
</tr>
<tr>
<td>Factory setting</td>
<td>0000 hex</td>
</tr>
</tbody>
</table>

Description: Sets the mapping parameters for CANopen Receive Process Data Object 2 (RPDO 2).

Index:
- [0] = Mapped object 1
- [1] = Mapped object 2
- [3] = Mapped object 4

Note: Corresponds to the CANopen object 1601 hex + 40 hex * x (x: Drive number 0 ... 7).
Dummy mapping not supported.
The parameter can only be written online when the associated COB ID in p870x is set as invalid.
### List of parameters

#### p8712[0...3] CAN Receive Mapping for RPDO 3 / Mapping RPDO 3

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Index</th>
<th>Note</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed: C1(3), T</td>
<td>Sets the mapping parameters for CANopen Receive Process Data Object 3 (RPDO 3).</td>
<td>[0] = Mapped object 1</td>
<td>Corresponds to the CANopen object 1602 hex + 40 hex * x (x: Drive number 0 ... 7). Dummy mapping not supported. The parameter can only be written online when the associated COB ID in p870x is set as invalid.</td>
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#### p8713[0...3] CAN Receive Mapping for RPDO 4 / Mapping RPDO 4

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<th>Factory setting</th>
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<td>Sets the mapping parameters for CANopen Receive Process Data Object 4 (RPDO 4).</td>
<td>[0] = Mapped object 1</td>
<td>Corresponds to the CANopen object 1603 hex + 40 hex * x (x: Drive number 0 ... 7). Dummy mapping not supported. The parameter can only be written online when the associated COB ID in p870x is set as invalid.</td>
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<td>Function diagram: 9204, 9206</td>
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#### p8714[0...3] CAN Receive Mapping for RPDO 5 / Mapping RPDO 5

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<th>Note</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
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<td>Can be changed: C1(3), T</td>
<td>Sets the mapping parameters for CANopen Receive Process Data Object 5 (RPDO 5).</td>
<td>[0] = Mapped object 1</td>
<td>Corresponds to the CANopen object 1604 hex + 40 hex * x (x: Drive number 0 ... 7). Dummy mapping not supported. The parameter can only be written online when the associated COB ID in p870x is set as invalid.</td>
<td>0000 hex FFFF FFFF hex 0000 hex</td>
</tr>
<tr>
<td>Min</td>
<td></td>
<td>Dynamic index: -</td>
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<td>Calculated: -</td>
<td>Units group: -</td>
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</table>
### List of parameters

#### p8715[0...3] CAN Receive Mapping for RPDO 6 / Mapping RPDO 6

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<th>Note</th>
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</thead>
<tbody>
<tr>
<td>Can be changed: C1(3), T</td>
<td>Sets the mapping parameters for CANopen Receive Process Data Object 6 (RPDO 6).</td>
<td>[0] = Mapped object 1</td>
<td>Corresponds to the CANopen object 1605 hex + 40 hex * x (x: Drive number 0 ... 7). Dummy mapping not supported. The parameter can only be written online when the associated COB ID in p870x is set as invalid.</td>
</tr>
<tr>
<td>Not for motor type:</td>
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<td>[3] = Mapped object 4</td>
<td></td>
</tr>
<tr>
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<tr>
<td>Max</td>
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<td>FFFF FFFF hex</td>
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#### p8716[0...3] CAN Receive Mapping for RPDO 7 / Mapping RPDO 7

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<tbody>
<tr>
<td>Can be changed: C1(3), T</td>
<td>Sets the mapping parameters for CANopen Receive Process Data Object 7 (RPDO 7).</td>
<td>[0] = Mapped object 1</td>
<td>Corresponds to the CANopen object 1606 hex + 40 hex * x (x: Drive number 0 ... 7). Dummy mapping not supported. The parameter can only be written online when the associated COB ID in p870x is set as invalid.</td>
</tr>
<tr>
<td>Not for motor type:</td>
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<td>[3] = Mapped object 4</td>
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<td>0000 hex</td>
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#### p8717[0...3] CAN Receive Mapping for RPDO 8 / Mapping RPDO 8

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<th>Note</th>
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</thead>
<tbody>
<tr>
<td>Can be changed: C1(3), T</td>
<td>Sets the mapping parameters for CANopen Receive Process Data Object 8 (RPDO 8).</td>
<td>[0] = Mapped object 1</td>
<td>Corresponds to the CANopen object 1607 hex + 40 hex * x (x: Drive number 0 ... 7). Dummy mapping not supported. The parameter can only be written online when the associated COB ID in p870x is set as invalid.</td>
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<tr>
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<td>[3] = Mapped object 4</td>
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<tr>
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<td>0000 hex</td>
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<tr>
<td>Max</td>
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<td>FFFF FFFF hex</td>
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</table>
### p8720[0...4] CAN Transmit PDO 1 / Transmit PDO 1

<table>
<thead>
<tr>
<th>Description</th>
<th>Sets the communication parameters for CANopen Transmit Process Data Object 1 (TPDO 1).</th>
</tr>
</thead>
</table>
| Index       | [0] = PDO COB-ID  
                      [1] = PDO transmission type  
                      [2] = Inhibit time (in 100 µs)  
                      [3] = Reserved  
                      [4] = Event timer (in ms) |
| Dependency  | A valid COB-ID can only be set for the available (existing) channel.  
                      Refer to: p8741 |
| Notice      | For inhibit time and even timer, the following apply:  
                      A value that is not a multiple integer of CANopen (4 ms) is rounded-off. |
| Note        | Corresponds to the CANopen object 1800 hex + 40 hex * x (x: Drive number 0 ... 7).  
                      Transmission types 0, 1 ... F0, FE and FF can be set.  
                      PDO: Process Data Object |

| p8721[0...4] CAN Transmit PDO 2 / Transmit PDO 2 |

<table>
<thead>
<tr>
<th>Description</th>
<th>Sets the communication parameters for CANopen Transmit Process Data Object 2 (TPDO 2).</th>
</tr>
</thead>
</table>
| Index       | [0] = PDO COB-ID  
                      [1] = PDO transmission type  
                      [2] = Inhibit time (in 100 µs)  
                      [3] = Reserved  
                      [4] = Event timer (in ms) |
| Dependency  | A valid COB-ID can only be set for the available (existing) channel.  
                      Refer to: p8741 |
| Notice      | For inhibit time and even timer, the following apply:  
                      A value that is not a multiple integer of CANopen (4 ms) is rounded-off. |
| Note        | Corresponds to the CANopen object 1801 hex + 40 hex * x (x: Drive number 0 ... 7).  
                      Transmission types 0, 1 ... F0, FE and FF can be set.  
                      PDO: Process Data Object |
**Parameter**

**List of parameters**

| p8722[0...4] CAN Transmit PDO 3 / Transmit PDO 3 |
|---|---|---|
| **SERVO_S110-CAN** | **Can be changed:** C1(3), T | **Calculated:** - |
| **Data type:** Unsigned32 | **Dynamic index:** - | **Access level:** 3 |
| **P-Group:** Communications | **Units group:** - | **Func. diagram:** 9208, 9210 |
| **Not for motor type:** - | **Scaling:** - | **Expert list:** 1 |
| **Min** | **Max** | **Factory setting** |
| 0000 hex | C000 06DF hex | [0] C000 06DF hex |
|  |  | [1] 00FE hex |
|  |  | [2] 0000 hex |
|  |  | [3] 0000 hex |
|  |  | [4] 0000 hex |

**Description:**
Sets the communication parameters for CANopen Transmit Process Data Object 3 (TPDO 3).

**Index:**
- [0] = PDO COB-ID
- [1] = PDO transmission type
- [2] = Inhibit time (in 100 µs)
- [3] = Reserved
- [4] = Event timer (in ms)

**Dependency:**
A valid COB-ID can only be set for the available (existing) channel.
Refer to: p8741

**Notice:**
For inhibit time and even timer, the following apply:
A value that is not a multiple integer of CANopen (4 ms) is rounded-off.

**Note:**
Corresponds to the CANopen object 1802 hex + 40 hex * x (x: Drive number 0 ... 7).
Transmission types 0, 1 ... F0, FE and FF can be set.
PDO: Process Data Object

| p8723[0...4] CAN Transmit PDO 4 / Transmit PDO 4 |
|---|---|---|
| **SERVO_S110-CAN** | **Can be changed:** C1(3), T | **Calculated:** - |
| **Data type:** Unsigned32 | **Dynamic index:** - | **Access level:** 3 |
| **P-Group:** Communications | **Units group:** - | **Func. diagram:** 9208, 9210 |
| **Not for motor type:** - | **Scaling:** - | **Expert list:** 1 |
| **Min** | **Max** | **Factory setting** |
| 0000 hex | C000 06DF hex | [0] C000 06DF hex |
|  |  | [1] 00FE hex |
|  |  | [2] 0000 hex |
|  |  | [3] 0000 hex |
|  |  | [4] 0000 hex |

**Description:**
Sets the communication parameters for CANopen Transmit Process Data Object 4 (TPDO 4).

**Index:**
- [0] = PDO COB-ID
- [1] = PDO transmission type
- [2] = Inhibit time (in 100 µs)
- [3] = Reserved
- [4] = Event timer (in ms)

**Dependency:**
A valid COB-ID can only be set for the available (existing) channel.
Refer to: p8741

**Notice:**
For inhibit time and even timer, the following apply:
A value that is not a multiple integer of CANopen (4 ms) is rounded-off.

**Note:**
Corresponds to the CANopen object 1803 hex + 40 hex * x (x: Drive number 0 ... 7).
Transmission types 0, 1 ... F0, FE and FF can be set.
PDO: Process Data Object
## List of parameters

### p8724[0...4] CAN Transmit PDO 5 / Transmit PDO 5

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<th>Notice</th>
<th>Note</th>
</tr>
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<td>Sets the communication parameters for CANopen Transmit Process Data Object 5 (TPDO 5).</td>
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<td>A valid COB-ID can only be set for the available (existing) channel.</td>
<td>For inhibit time and even timer, the following apply: A value that is not a multiple integer of CANopen (4 ms) is rounded-off.</td>
<td>Corresponds to the CANopen object 1804 hex + 40 hex * x (x: Drive number 0 ... 7). Transmission types 0, 1 ... F0, FE and FF can be set. PDO: Process Data Object</td>
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<td>Units group:</td>
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<td>Factory setting</td>
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### p8725[0...4] CAN Transmit PDO 6 / Transmit PDO 6

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<th>Dependency</th>
<th>Notice</th>
<th>Note</th>
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<td>Sets the communication parameters for CANopen Transmit Process Data Object 6 (TPDO 6).</td>
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<td>A valid COB-ID can only be set for the available (existing) channel.</td>
<td>For inhibit time and even timer, the following apply: A value that is not a multiple integer of CANopen (4 ms) is rounded-off.</td>
<td>Corresponds to the CANopen object 1805 hex + 40 hex * x (x: Drive number 0 ... 7). Transmission types 0, 1 ... F0, FE and FF can be set. PDO: Process Data Object</td>
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<tr>
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### CAN Transmit PDO 7 / Transmit PDO 7

**Description:**
Sets the communication parameters for CANopen Transmit Process Data Object 7 (TPDO 7).

**Index:**
- [0] = PDO COB-ID
- [1] = PDO transmission type
- [2] = Inhibit time (in 100 µs)
- [3] = Reserved
- [4] = Event timer (in ms)

**Dependency:**
A valid COB-ID can only be set for the available (existing) channel.
Refer to: p8741

**Notice:**
For inhibit time and even timer, the following apply:
A value that is not a multiple integer of CANopen (4 ms) is rounded-off.

**Note:**
Corresponds to the CANopen object 1806 hex + 40 hex * x (x: Drive number 0 ... 7).
Transmission types 0, 1 ... F0, FE and FF can be set.

PDO: Process Data Object

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<td>[0] C000 06DF hex</td>
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<tr>
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<td>[1] 00FE hex</td>
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<td>[4] 0000 hex</td>
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### CAN Transmit PDO 8 / Transmit PDO 8

**Description:**
Sets the communication parameters for CANopen Transmit Process Data Object 8 (TPDO 8).

**Index:**
- [0] = PDO COB-ID
- [1] = PDO transmission type
- [2] = Inhibit time (in 100 µs)
- [3] = Reserved
- [4] = Event timer (in ms)

**Dependency:**
A valid COB-ID can only be set for the available (existing) channel.
Refer to: p8741

**Notice:**
For inhibit time and even timer, the following apply:
A value that is not a multiple integer of CANopen (4 ms) is rounded-off.

**Note:**
Corresponds to the CANopen object 1807 hex + 40 hex * x (x: Drive number 0 ... 7).
Transmission types 0, 1 ... F0, FE and FF can be set.

PDO: Process Data Object

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0000 hex</td>
<td>C000 06DF hex</td>
<td>[0] C000 06DF hex</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[1] 00FE hex</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[2] 0000 hex</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[3] 0000 hex</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[4] 0000 hex</td>
</tr>
</tbody>
</table>
### p8730[0...3] CAN Transmit Mapping for TPDO 1 / Mapping TPDO 1

**SERVO_S110-CAN**

**Can be changed:** C1(3), T  
**Calculated:** -  
**Access level:** 3

**Data type:** Unsigned32  
**Dynamic index:** -  
**Func. diagram:** 9208, 9210

**P-Group:** Communications  
**Units group:** -  
**Unit selection:** -

**Not for motor type:** -  
**Scaling:** -  
**Expert list:** 1

**Min:** 0000 hex  
**Max:** FFFF FFFF hex  
**Factory setting:** 0000 hex

**Description:** Sets the mapping parameters for CANopen Transmit Process Data Object 1 (TPDO 1).

**Index:**
- [0] = Mapped object 1
- [1] = Mapped object 2
- [3] = Mapped object 4

**Note:** Corresponds to the CANopen object 1A00 hex + 40 hex * x (x: Drive number 0 ... 7). The parameter can only be written online when the associated COB ID in p872x is set as invalid.

### p8731[0...3] CAN Transmit Mapping for TPDO 2 / Mapping TPDO 2

**SERVO_S110-CAN**

**Can be changed:** C1(3), T  
**Calculated:** -  
**Access level:** 3

**Data type:** Unsigned32  
**Dynamic index:** -  
**Func. diagram:** 9208, 9210

**P-Group:** Communications  
**Units group:** -  
**Unit selection:** -

**Not for motor type:** -  
**Scaling:** -  
**Expert list:** 1

**Min:** 0000 hex  
**Max:** FFFF FFFF hex  
**Factory setting:** 0000 hex

**Description:** Sets the mapping parameters for CANopen Transmit Process Data Object 2 (TPDO 2).

**Index:**
- [0] = Mapped object 1
- [1] = Mapped object 2
- [3] = Mapped object 4

**Note:** Corresponds to the CANopen object 1A01 hex + 40 hex * x (x: Drive number 0 ... 7). The parameter can only be written online when the associated COB ID in p872x is set as invalid.

### p8732[0...3] CAN Transmit Mapping for TPDO 3 / Mapping TPDO 3

**SERVO_S110-CAN**

**Can be changed:** C1(3), T  
**Calculated:** -  
**Access level:** 3

**Data type:** Unsigned32  
**Dynamic index:** -  
**Func. diagram:** 9208, 9210

**P-Group:** Communications  
**Units group:** -  
**Unit selection:** -

**Not for motor type:** -  
**Scaling:** -  
**Expert list:** 1

**Min:** 0000 hex  
**Max:** FFFF FFFF hex  
**Factory setting:** 0000 hex

**Description:** Sets the mapping parameters for CANopen Transmit Process Data Object 3 (TPDO 3).

**Index:**
- [0] = Mapped object 1
- [1] = Mapped object 2
- [3] = Mapped object 4

**Note:** Corresponds to the CANopen object 1A02 hex + 40 hex * x (x: Drive number 0 ... 7). The parameter can only be written online when the associated COB ID in p872x is set as invalid.

### p8733[0...3] CAN Transmit Mapping for TPDO 4 / Mapping TPDO 4

**SERVO_S110-CAN**

**Can be changed:** C1(3), T  
**Calculated:** -  
**Access level:** 3

**Data type:** Unsigned32  
**Dynamic index:** -  
**Func. diagram:** 9208, 9210

**P-Group:** Communications  
**Units group:** -  
**Unit selection:** -

**Not for motor type:** -  
**Scaling:** -  
**Expert list:** 1

**Min:** 0000 hex  
**Max:** FFFF FFFF hex  
**Factory setting:** 0000 hex

**Description:** Sets the mapping parameters for CANopen Transmit Process Data Object 4 (TPDO 4).
Parameter

List of parameters

Index:

- [0] = Mapped object 1
- [1] = Mapped object 2
- [3] = Mapped object 4

Note:

Corresponds to the CANopen object 1A03 hex + 40 hex * x (x: Drive number 0 ... 7).

The parameter can only be written online when the associated COB ID in p872x is set as invalid.

p8734[0...3] CAN Transmit Mapping for TPDO 5 / Mapping TPDO 5

SERVO_S110-CAN

Can be changed: C1(3), T

Data type: Unsigned32

P-Group: Communications

Not for motor type: -

Min 0000 hex

Max FFFF FFFF hex

Factory setting 0000 hex

Access level: 3

Func. diagram: 9208

Index:

- [0] = Mapped object 1
- [1] = Mapped object 2
- [3] = Mapped object 4

Note:

Corresponds to the CANopen object 1A04 hex + 40 hex * x (x: Drive number 0 ... 7).

The parameter can only be written online when the associated COB ID in p872x is set as invalid.

p8735[0...3] CAN Transmit Mapping for TPDO 6 / Mapping TPDO 6

SERVO_S110-CAN

Can be changed: C1(3), T

Data type: Unsigned32

P-Group: Communications

Not for motor type: -

Min 0000 hex

Max FFFF FFFF hex

Factory setting 0000 hex

Access level: 3

Func. diagram: 9208

Index:

- [0] = Mapped object 1
- [1] = Mapped object 2
- [3] = Mapped object 4

Note:

Corresponds to the CANopen object 1A05 hex + 40 hex * x (x: Drive number 0 ... 7).

The parameter can only be written online when the associated COB ID in p872x is set as invalid.

p8736[0...3] CAN Transmit Mapping for TPDO 7 / Mapping TPDO 7

SERVO_S110-CAN

Can be changed: C1(3), T

Data type: Unsigned32

P-Group: Communications

Not for motor type: -

Min 0000 hex

Max FFFF FFFF hex

Factory setting 0000 hex

Access level: 3

Func. diagram: 9208

Index:

- [0] = Mapped object 1
- [1] = Mapped object 2
- [3] = Mapped object 4

Note:

Corresponds to the CANopen object 1A06 hex + 40 hex * x (x: Drive number 0 ... 7).

The parameter can only be written online when the associated COB ID in p872x is set as invalid.
**List of parameters**

### p8737[0...3]
**CAN Transmit Mapping for TPDO 8 / Mapping TPDO 8**

**SERVO_S110-CAN**

<table>
<thead>
<tr>
<th>Description:</th>
<th>Sets the mapping parameters for CANopen Transmit Process Data Object 8 (TPDO 8).</th>
</tr>
</thead>
</table>
| **Index:**   | [0] = Mapped object 1  
|              | [1] = Mapped object 2  
|              | [3] = Mapped object 4  |
| **Note:**    | Corresponds to the CANopen object 1A07 hex + 40 hex * x (x: Drive number 0 ... 7).  
|              | The parameter can only be written online when the associated COB ID in p872x is set as invalid. |

**p8741**
**CAN PDO configuration acknowledgement / PDO config ackn**

**CU_S110-CAN**

<table>
<thead>
<tr>
<th>Description:</th>
<th>Acknowledges the setting of the Predefined Connection Sets (p8744).</th>
</tr>
</thead>
</table>
| **Value:**   | 0: Inactive  
|              | 1: Acknowledge configuration  |
| **Dependency:** | Refer to: p8744 |

**p8743[0...7]**
**CAN assignment drive/drive ID / Drive ID**

**CU_S110-CAN**

<table>
<thead>
<tr>
<th>Description:</th>
<th>Displays the drive ID associated with each drive.</th>
</tr>
</thead>
</table>
| **Index:**   | [0] = Drive ID for 1st drive  
|              | [1] = Drive ID for 2nd drive  
|              | [2] = Drive ID for 3rd drive  
|              | [3] = Drive ID for 4th drive  
|              | [4] = Drive ID for 5th drive  
|              | [5] = Drive ID for 6th drive  
|              | [6] = Drive ID for 7th drive  
|              | [7] = Drive ID for 8th drive  |

**p8744**
**CAN PDO mapping configuration / PDO Mapping conf.**

**SERVO_S110-CAN**

| Description: | Selector switch for the PDO mapping.  
<table>
<thead>
<tr>
<th></th>
<th>Sets the mapping for download or in the online mode after acknowledging with p8741.</th>
</tr>
</thead>
</table>
| **Access level:** | 2  
| **Func. diagram:** | 9204, 9206, 9208, 9210  
| **Units group:** | -  
| **Expert list:** | 1  
| **Factory setting:** | -  
| **Scaling:** | -  
| **Min:** | 1  
| **Max:** | 2  
| **Dynamic index:** | -  
| **Calculated:** | -  
| **Can be changed:** | C2, T  
| **Data type:** | Integer16  
| **P-Group:** | -  
| **Not for motor type:** | -  
| **Units group:** | -  
| **Scaling:** | -  
| **Min:** | 0  
| **Max:** | 1  
| **Factory setting:** | FFFF FFFF hex  
| **Units group:** | -  
| **Expert list:** | 1  
| **Factory setting:** | 0000 hex  
| **Units group:** | -  
| **Expert list:** | 1  
| **Units group:** | -  
| **Expert list:** | 1  
| **Units group:** | -  

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SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3
**Parameter**

**List of parameters**

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Predefined Connection Set</td>
</tr>
<tr>
<td>2</td>
<td>Free PDO Mapping</td>
</tr>
</tbody>
</table>

**r8750[0...15]** CAN mapped 16-bit receive objects / RPDO 16 mapped

**SERVO_S110-CAN**

- Can be changed: -
- Calculated: -
- Access level: 3
- Data type: Unsigned16
- Dynamic index: -
- Func. diagram: -
- P-Group: Communications
- Units group: -
- Unit selection: -
- Not for motor type: -
- Scaling: -
- Expert list: 1
- Min
- Max
- Factory setting

**Description:** Displays the mapped 16-bit receive CANopen objects in the process data buffer.

**Example:**
If, e.g. the control word is mapped in an RPDO, then r8750 indicates the position of the control word in the process data buffer.

**Index:**

\[
\begin{align*}
[0] & = \text{PZD 1} \\
[1] & = \text{PZD 2} \\
[2] & = \text{PZD 3} \\
[3] & = \text{PZD 4} \\
[4] & = \text{PZD 5} \\
[5] & = \text{PZD 6} \\
[6] & = \text{PZD 7} \\
[7] & = \text{PZD 8} \\
[8] & = \text{PZD 9} \\
[9] & = \text{PZD 10} \\
[10] & = \text{PZD 11} \\
[11] & = \text{PZD 12} \\
[12] & = \text{PZD 13} \\
[13] & = \text{PZD 14} \\
[14] & = \text{PZD 15} \\
[15] & = \text{PZD 16}
\end{align*}
\]

**r8751[0...15]** CAN mapped 16-bit transmit objects / TPDO 16 mapped

**SERVO_S110-CAN**

- Can be changed: -
- Calculated: -
- Access level: 3
- Data type: Unsigned16
- Dynamic index: -
- Func. diagram: -
- P-Group: Communications
- Units group: -
- Unit selection: -
- Not for motor type: -
- Scaling: -
- Expert list: 1
- Min
- Max
- Factory setting

**Description:** Displays mapped 16-bit transmit CANopen objects in the process data buffer.

**Index:**

\[
\begin{align*}
[0] & = \text{PZD 1} \\
[1] & = \text{PZD 2} \\
[2] & = \text{PZD 3} \\
[3] & = \text{PZD 4} \\
[4] & = \text{PZD 5} \\
[5] & = \text{PZD 6} \\
[6] & = \text{PZD 7} \\
[7] & = \text{PZD 8} \\
[8] & = \text{PZD 9} \\
[9] & = \text{PZD 10} \\
[10] & = \text{PZD 11} \\
[11] & = \text{PZD 12} \\
[12] & = \text{PZD 13} \\
[13] & = \text{PZD 14} \\
[14] & = \text{PZD 15} \\
[15] & = \text{PZD 16}
\end{align*}
\]

**Dependency:** Refer to: r8750
r8760[0...14] CAN mapped 32-bit receive objects / RPDO 32 mapped
SERVO_S110-CAN

Description:
Displays the mapped 32-bit receive CANopen objects in the process data buffer.

Index:
[0] = PZD 1 + 2  
[1] = PZD 2 + 3  
[2] = PZD 3 + 4  
[3] = PZD 4 + 5  
[4] = PZD 5 + 6  
[5] = PZD 6 + 7  
[6] = PZD 7 + 8  
[7] = PZD 8 + 9  
[8] = PZD 9 + 10  
[9] = PZD 10 + 11  
[10] = PZD 11 + 12  
[12] = PZD 13 + 14  
[13] = PZD 14 + 15  
[14] = PZD 15 + 16

r8761[0...14] CAN mapped 32-bit transmit objects / TPDO 32 mapped
SERVO_S110-CAN

Description:
Displays mapped 32-bit transmit CANopen objects in the process data buffer.

Index:
[0] = PZD 1 + 2  
[1] = PZD 2 + 3  
[2] = PZD 3 + 4  
[3] = PZD 4 + 5  
[4] = PZD 5 + 6  
[5] = PZD 6 + 7  
[6] = PZD 7 + 8  
[7] = PZD 8 + 9  
[8] = PZD 9 + 10  
[9] = PZD 10 + 11  
[10] = PZD 11 + 12  
[12] = PZD 13 + 14  
[13] = PZD 14 + 15  
[14] = PZD 15 + 16

r8784 CO: CAN status word / Status word
SERVO_S110-CAN

Description:
Displays the CANopen status word.
### List of parameters

<table>
<thead>
<tr>
<th>Bit field:</th>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>00</td>
<td>Rdy for switch on</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>01</td>
<td>Ready</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>02</td>
<td>Operation enabled</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>03</td>
<td>Fault present</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>04</td>
<td>No coasting active</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>05</td>
<td>No Quick Stop active</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>06</td>
<td>Switching on inhibited active</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>07</td>
<td>Alarm present</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>08</td>
<td>Can be freely interconnected (BI: p8785)</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>09</td>
<td>Control request</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>Target reached</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>Torque limit reached</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>Velocity equal to zero</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>14</td>
<td>Can be freely interconnected (BI: p8786)</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>Can be freely interconnected (BI: p8787)</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
</tbody>
</table>

**Note:**
Corresponds to the CANopen object 6041 hex + 800 hex * x (x: Drive number 0 ... 7).

Re bit 10:
When the ramp-function generator is activated, the interconnection from Cl: p2151 = r1119 can be changed, so that to evaluate bit 10, the setpoint can be retrieved (taken) from in front of the ramp-function generator.

Re bit 10, 12:
When braking, the two bits must indicate the same state. This is the reason that the following parameters must be set the same:
p2161 (speed threshold value 3, for r2199.0) = p2163 (speed threshold value 4, for r2197.7)
p2150 (hysteresis speed 3, for r2199.0) = p2164 (hysteresis speed 4, for r2197.7)

#### p8785
**BI: CAN status word bit 8 / Status word bit 8**

**SERVO_S110-CAN**

- **Can be changed:** T
- **Data type:** Unsigned32 / Binary
- **P-Group:** Communications
- **Not for motor type:** -
- **Min:** -
- **Max:** -
- **Calculation:** Calculated: -
- **Access level:** 3
- **Dynamic index:** -
- **Units group:** -
- **Scaling:** -
- **Unit selection:** -
- **Expert list:** 1
- **Factory setting:** 0

**Description:**
Binector input for CANopen status word bit 8.

**Dependency:**
Refer to: r8784

#### p8786
**BI: CAN status word bit 14 / Status word bit 14**

**SERVO_S110-CAN**

- **Can be changed:** T
- **Data type:** Unsigned32 / Binary
- **P-Group:** Communications
- **Not for motor type:** -
- **Min:** -
- **Max:** -
- **Calculation:** Calculated: -
- **Access level:** 3
- **Dynamic index:** -
- **Units group:** -
- **Scaling:** -
- **Unit selection:** -
- **Expert list:** 1
- **Factory setting:** 0

**Description:**
Binector input for CANopen status word bit 14.

**Dependency:**
Refer to: r8784

#### p8787
**BI: CAN status word bit 15 / Status word bit 15**

**SERVO_S110-CAN**

- **Can be changed:** T
- **Data type:** Unsigned32 / Binary
- **P-Group:** Communications
- **Not for motor type:** -
- **Min:** -
- **Max:** -
- **Calculation:** Calculated: -
- **Access level:** 3
- **Dynamic index:** -
- **Units group:** -
- **Scaling:** -
- **Unit selection:** -
- **Expert list:** 1
- **Factory setting:** 0

**Description:**
Binector input for CANopen status word bit 15.

**Dependency:**
Refer to: r8784
**Parameter**

**List of parameters**

---

**p8790**

**CAN control word - auto interconnection / STW interc auto**

**SERVO_S110-CAN**

| Description: | Sets the automatic BICO interconnection of the CANopen control word. |
| Value: | 0: No interconn  
1: Interconnection |
| Dependency: | Refer to: r2050, r2090, r2091, r2092, r2093, r8750, r8795 |
| Note: | The following BICO interconnections are automatically established if the CANopen control word is mapped at one of the locations x = 0 ... 3 in the receive process data buffer. For SINAMICS S120 with CBC10, the PZD interface IF2 is used:  
BI: p0840.0 = r889x.0  
BI: p0844.0 = r889x.1  
BI: p0848.0 = r889x.2  
BI: p0852.0 = r889x.3  
BI: p2103.0 = r889x.7  
For SINAMICS S110, the PZD interface IF1 is used:  
BI: p0840.0 = r209x.0  
BI: p0844.0 = r209x.1  
BI: p0848.0 = r209x.2  
BI: p0852.0 = r209x.3  
BI: p2103.0 = r209x.7  
The write access is rejected if a CANopen control word is not mapped at one of these locations. This also causes the project download of the commissioning software to be canceled. |

---

**r8795**

**CAN control word / Control word**

**SERVO_S110-CAN**

| Description: | Access to the CANopen control word using SDO transfer. |
| Bit field: | Bit | Signal name | 1 signal | 0 signal | FP |
| 00 | OFF/OFF1 | Yes | No | - |
| 01 | Do not activate coast down | Yes | No | - |
| 02 | Do not activate a Quick Stop | Yes | No | - |
| 03 | Operation enable | Yes | No | - |
| 07 | Acknowledge fault | Yes | No | - |
| 11 | Freely interconn | High | Low | - |
| 12 | Freely interconn | High | Low | - |
| 13 | Freely interconn | High | Low | - |
| 14 | Freely interconn | High | Low | - |
| 15 | Freely interconn | High | Low | - |

| Dependency: | Refer to: p8790 |
| Note: | Corresponds to the CANopen object 6040 hex + 800 hex * x (x: Drive number 0 ... 7). |
**r8796  CAN Target Velocity / Target velocity**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>r8796</strong></td>
<td>Access to the CANopen object target velocity using the SDO transfer. The value is displayed in increments/second as standard.</td>
<td>Corresponds to the CANopen object 60FF hex + 800 hex * x (x: Drive number 0 ... 7). The displayed value is calculated as follows: ( r8796 = \frac{n_{set} \text{[RPM]}}{60 \text{s}} \times p0408 \times 2^{p0418} \times p8798[1]}{p8798[0]} )</td>
</tr>
</tbody>
</table>

**Data type:** Integer32  
**P-Group:** -  
**Not for motor type:** -  
**Min:** -  
**Max:** -  
**Func. diagram:** -  
**Unit selection:** -  
**Expert list:** 1  
**Factory setting:** -  

**Access level:** 3

**Description:**

**Note:**

**Min Max Factory setting**

- - -

**p8798[0...1] CAN speed conversion factor / n_conv_factor**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>p8798[0...1]</strong></td>
<td>The factor converts the required velocity units into the internal velocity units (U/s). With the factor setting, for CANopen, the velocity units are increments/second. The parameter corresponds to the CANopen object 6094 hex. The internal velocity is calculated as follows: ( n_{set_internal} = \frac{6094.1}{6094.2} \times (p0408 \times 2^{p0418}) \times n_{set_bus} )</td>
<td></td>
</tr>
</tbody>
</table>

**Index:**

[0] = Counter  
[1] = Denominator

**Access level:** 3

**Description:**

**Note:**

**Min Max Factory setting**

- - -

**r8909 PN device ID / PN device ID**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>r8909</strong></td>
<td>Displays the PROFINET Device ID. Every SINAMICS device type has its own PROFINET Device ID and its own PROFINET GSD.</td>
<td></td>
</tr>
</tbody>
</table>

**Data type:** Unsigned16  
**P-Group:** -  
**Not for motor type:** -  
**Min:** -  
**Max:** -  
**Func. diagram:** -  
**Unit selection:** -  
**Expert list:** 1  
**Factory setting:** -  

**Access level:** 3

**Description:**

**Note:**

**Min Max Factory setting**

- - -

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SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3
Note: List of the SINAMICS Device IDs:
0501 hex: S120/S150
0504 hex: G130/G150
0505 hex: GM150
0509 hex: GL150
050A hex: DC MASTER
050B hex: SL150
050C hex: SM120
050E hex: S110

**p8920[0...239]** PN Name of Station / PN Name Stat

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Data type</th>
<th>P-Group</th>
<th>Not for motor type</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CU_S110-PN</strong></td>
<td>Unsigned8</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Can be changed: U, T</td>
<td>Calculated: -</td>
<td>Dynamic index: -</td>
<td>Units group: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td>Access level: 3</td>
</tr>
<tr>
<td>Description:</td>
<td>Sets the station name for the onboard PROFINET interface on the Control Unit.</td>
<td>The active station name is displayed in r8930.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Note:</td>
<td>An ASCII table (excerpt) can be found, for example, in the appendix to the List Manual.</td>
<td>The interface configuration (p8920 and following) is activated with p8925 = 1.</td>
<td>The parameter is not influenced by setting the factory setting.</td>
<td>PN: PROFINET</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**p8921[0...3]** PN IP address of station / PN IP of stat

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Data type</th>
<th>P-Group</th>
<th>Not for motor type</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CU_S110-PN</strong></td>
<td>Unsigned8</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Can be changed: U, T</td>
<td>Calculated: -</td>
<td>Dynamic index: -</td>
<td>Units group: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td>Access level: 3</td>
</tr>
<tr>
<td>Description:</td>
<td>Sets the IP address for the onboard PROFINET interface on the Control Unit.</td>
<td>The active IP address is displayed in r8931.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Note:</td>
<td>The interface configuration (p8920 and following) is activated with p8925 = 1.</td>
<td>The parameter is not influenced by setting the factory setting.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**p8922[0...3]** PN Default Gateway of Station / PN Def Gateway

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Data type</th>
<th>P-Group</th>
<th>Not for motor type</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CU_S110-PN</strong></td>
<td>Unsigned8</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Can be changed: U, T</td>
<td>Calculated: -</td>
<td>Dynamic index: -</td>
<td>Units group: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td>Access level: 3</td>
</tr>
<tr>
<td>Description:</td>
<td>Sets the default gateway for the onboard PROFINET interface on the Control Unit.</td>
<td>The active default gateway is displayed in r8932.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Note:</td>
<td>The interface configuration (p8920 and following) is activated with p8925 = 1.</td>
<td>The parameter is not influenced by setting the factory setting.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## List of parameters

### p8923[0...3] PN Subnet Mask of Station / PN Subnet Mask

<table>
<thead>
<tr>
<th>CU_S110-PN</th>
<th>Can be changed: U, T</th>
<th>Calculated: -</th>
<th>Access level: 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type:</td>
<td>Unsigned8</td>
<td>Dynamic index: -</td>
<td>Func. diagram: -</td>
</tr>
<tr>
<td>P-Group:</td>
<td>-</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>255</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

**Description:**
Sets the subnet mask for the onboard PROFINET interface on the Control Unit.
The active subnet mask is displayed in r8933.

**Note:**
The interface configuration (p8920 and following) is activated with p8925 = 1.
The parameter is not influenced by setting the factory setting.

### p8925 PN interface configuration / PN IF config

<table>
<thead>
<tr>
<th>CU_S110-PN</th>
<th>Can be changed: U, T</th>
<th>Calculated: -</th>
<th>Access level: 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type:</td>
<td>Integer16</td>
<td>Dynamic index: -</td>
<td>Func. diagram: -</td>
</tr>
<tr>
<td>P-Group:</td>
<td>-</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>3</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

**Description:**
Setting to control the configuration for the onboard PROFINET interface on the Control Unit.
p8925 is automatically set to 0 at the end of the operation.

**Value:**
0: No function
1: Activate configuration
2: Activate and save configuration
3: Delete configuration

**Note:**
Re p8925 = 1:
The interface configuration (p8920 and following) is activated.
Re p8925 = 2:
The interface configuration (p8920 and following) is activated and saved to non-volatile memory.
Re p8925 = 3:
Restores all memory locations for the interface configuration to the factory settings.
The factory settings for the interface configuration are loaded on activation (p8925 = 1) or at the next POWER ON.

### p8929 PN remote controller number / PN rem ctrl num

<table>
<thead>
<tr>
<th>CU_S110-PN</th>
<th>Can be changed: C1(1)</th>
<th>Calculated: -</th>
<th>Access level: 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type:</td>
<td>Integer16</td>
<td>Dynamic index: -</td>
<td>Func. diagram: -</td>
</tr>
<tr>
<td>P-Group:</td>
<td>Communications</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**Description:**
Sets the number of remote controllers expected for PROFINET onboard.
The "Shared Device" functionality is activated with a value = 2.
The drive is being accessed by two PROFINET controllers simultaneously:
- automation controller (SIMOTION or SIMATIC A-CPU).
- safety controller (SIMATIC F-CPU).

**Value:**
1: Automation or Safety
2: Automation and Safety

**Notice:**
The F CPU may only use PROFIsafe telegrams.
The A CPU must be connected to enable the F CPU to gain access.
Set the value = 1 to commission the F CPU individually.

**Note:**
A change only becomes effective after POWER ON, reset or download.
### List of parameters

#### r8930[0...239] PN Name of Station active / PN Name Stat act
- **CU_S110-PN**
- Can be changed: -
- Calculated: -
- Access level: 3
- Data type: Unsigned8
- Dynamic index: -
- Func. diagram: -
- P-Group: -
- Units group: -
- Unit selection: -
- Not for motor type: -
- Scaling: -
- Expert list: 1
- Min
- Max
- Factory setting
-  
**Description:** Displays the active station name for the onboard PROFINET interface on the Control Unit.

#### r8931[0...3] PN IP Address of Station active / PN IP of Stat act
- **CU_S110-PN**
- Can be changed: -
- Calculated: -
- Access level: 3
- Data type: Unsigned8
- Dynamic index: -
- Func. diagram: -
- P-Group: -
- Units group: -
- Unit selection: -
- Not for motor type: -
- Scaling: -
- Expert list: 1
- Min
- Max
- Factory setting
-  
**Description:** Displays the active IP address for the onboard PROFINET interface on the Control Unit.

#### r8932[0...3] PN Default Gateway of Station active / PN Def Gateway act
- **CU_S110-PN**
- Can be changed: -
- Calculated: -
- Access level: 3
- Data type: Unsigned8
- Dynamic index: -
- Func. diagram: -
- P-Group: -
- Units group: -
- Unit selection: -
- Not for motor type: -
- Scaling: -
- Expert list: 1
- Min
- Max
- Factory setting
-  
**Description:** Displays the active default gateway for the onboard PROFINET interface on the Control Unit.

#### r8933[0...3] PN Subnet Mask of Station active / PN Subnet Mask act
- **CU_S110-PN**
- Can be changed: -
- Calculated: -
- Access level: 3
- Data type: Unsigned8
- Dynamic index: -
- Func. diagram: -
- P-Group: -
- Units group: -
- Unit selection: -
- Not for motor type: -
- Scaling: -
- Expert list: 1
- Min
- Max
- Factory setting
-  
**Description:** Displays the active subnet mask for the onboard PROFINET interface on the Control Unit.

#### r8935[0...5] PN MAC Address of Station / PN MAC of Station
- **CU_S110-PN**
- Can be changed: -
- Calculated: -
- Access level: 3
- Data type: Unsigned8
- Dynamic index: -
- Func. diagram: -
- P-Group: -
- Units group: -
- Unit selection: -
- Not for motor type: -
- Scaling: -
- Expert list: 1
- Min
- Max
- Factory setting
-  
**Description:** Displays the MAC address for the onboard PROFINET interface on the Control Unit.
**List of parameters**

### r8939  PN DAP ID / PN DAP ID

**CU_S110-PN**

<table>
<thead>
<tr>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access level: 3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Data type:** Unsigned32  
**Dynamic index:** -  
**Units group:** -  
**Expert list:** 1  
**Unit selection:** -  
**Factory setting:** -

**Description:**  
Displays the PROFINET Device Access Point ID (DAP ID) for the onboard PROFINET interface.  
The combination of device ID (r8909) and DAP ID uniquely identifies a PROFINET access point.

**Note:**  
List of the SINAMICS DAP IDs:  
20005 hex: CBE20 V4.3  
20006 hex: CBE20 V4.4  
20106 hex: CU310-2 PN V4.4  
20206 hex: CU305 PN V4.4  
20306 hex: CU320-2 PN V4.4

### r8955[0...5]  CBE20 MAC Address of Station / CBE20 MAC addr

**CU_S110-PN**

<table>
<thead>
<tr>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access level: 3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Data type:** Unsigned8  
**Dynamic index:** -  
**Unit selection:** -

**Description:**  
Displays the MAC address for the Communication Board Ethernet 20 (CBE20).

### p9210  Flashing component number / Flash comp_no.

**CU_S110-CAN, CU_S110-DP, CU_S110-PN**

<table>
<thead>
<tr>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access level: 3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Data type:** Unsigned16  
**Dynamic index:** -  
**Unit selection:** -

**Description:**  
Sets the component number for a component to get its status LED to flash.

**Dependency:**  
Refer to: p9211

### p9211  Flash function / Flash fct.

**CU_S110-CAN, CU_S110-DP, CU_S110-PN**

<table>
<thead>
<tr>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access level: 3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Data type:** Integer16  
**Dynamic index:** -  
**Expert list:** 1  
**Unit selection:** -

**Description:**  
Sets the function for the component selected in p9210.  
After initiating a function, the parameter is automatically reset again.

**Example:**  
- Set the component number (p9210).  
- Select the "flashing on" function (set p9211 = 1).

**Value:**  
-1: Select function  
0: Flashing off  
1: Flashing on

**Dependency:**  
Refer to: p9210
List of parameters

Notice:
If a task cannot be executed (e.g. the component number in p9210 does not exist), the following applies:
- There is no negative feedback signal.
- The value is reset anyway.

**p9300 SI Motion monitoring clock cycle (processor 2) / SI Mtn clock P2**

| Description: | Sets the monitoring clock cycle for safe motion monitoring. |
| Access level: | 3 |
| Data type: | FloatingPoint32 |
| Dynamic index: | - |
| Units group: | - |
| Unit selection: | - |
| Not for motor type: | - |
| Min | 500.00 [µs] |
| Max | 25000.00 [µs] |
| Factory setting | 12000.00 [µs] |
| Dependency: | Refer to: p9500, p9511 |
| Notice: | This parameter is overwritten by the copy function of the safety functions integrated in the drive. |
| Note: | The monitoring clock cycle must be a multiple of the actual value sensing clock cycle in p9311 or of the DP clock cycle. A change only becomes effective after a POWER ON. |

**p9301 SI Motion enable safety functions (processor 2) / SI Mtn enable P2**

| Description: | Sets the enable signals for the safe motion monitoring. |
| Bit field: | Bit Signal name 1 signal 0 signal FP |
| 00 | Enable SOS/SLS Enable Inhibit - |
| 16 | Enable SSM hysteresis and filtering Enable Inhibit 2860 |
| 17 | Enable SDI Enable Inhibit 2861 |
| Dependency: | Refer to: p9501, F01682, F01683 |
| Notice: | This parameter is overwritten by the copy function of the safety functions integrated in the drive. |
| Note: | A change only becomes effective after a POWER ON. SDI: Safe Direction (safe motion direction) SLS: Safely-Limited Speed SOS: Safe Operating Stop SSM: Safe Speed Monitor (safety-relevant feedback signal from the velocity monitoring) |

**p9302 SI Motion axis type (processor 2) / SI Mtn ax type P2**

| Description: | Sets the axis type (linear axis or rotary axis/spindle). |
| Value: | 0: Linear axis | 1: Rot axis/spindle |
| Dependency: | Refer to: p9502 |
| Notice: | This parameter is overwritten by the copy function of the safety functions integrated in the drive. |
Note: For the commissioning software, after changing over the axis type, the units dependent on the axis type are only updated after a project upload. A change only becomes effective after a POWER ON.

p9306 SI Motion function specification (processor 2) / SI Mtn fct spec P2

Description: Sets the function specification for the safe motion monitoring.
Value:
0: Safety with encoder
1: Safety without encoder
3: Safety without encoder with accel_monitoring/delay time
Dependency: Refer to: C30711
Notice: This parameter is overwritten by the copy function of the safety functions integrated in the drive.

p9307 SI Motion function configuration (processor 2) / SI Mtn config P2

Description: Sets the function configuration for the safe motion monitoring functions.
Bit field: Bit Signal name 0 signal FP
00 Extended message acknowledgement Yes No -
01 Setpoint velocity limit for STOP F No Yes -
02 Motor type sensorless actual value sensing Synchronous motor Induction motor -
Dependency: Refer to: CO1711
Notice: This parameter is overwritten by the copy function of the safety functions integrated in the drive.
Note: Re bit 00: When the function is activated, a safety-relevant acknowledgement (internal event acknowledge) can be performed by selecting/deselecting STO.
Re bit 01: When the function is activated, the active setpoint velocity limit (CO: r9733) is set to zero when STOP F is active.
Re bit 02: This bit defines the type of motor, which the sensorless safety technology evaluates.
For bit = 0, the sensorless motion monitoring function calculates the actual velocity for an induction motor.
For bit = 1, an actual velocity is calculated for a synchronous motor. This value depends on the setting in p0300.
Bit = 0 should be set if no motor is defined (p0300 = 0).

p9309 SI Motion behavior during pulse suppression (processor 2) / SI Mtn behav IL P2

Description: Sets the behavior of safety functions and their feedback during pulse suppression in encoderless operation.
### List of parameters

<table>
<thead>
<tr>
<th>Bit field</th>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>00</td>
<td>SSM during pulse suppression and sensor-less</td>
<td>Becomes inactive</td>
<td>Remains active</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>08</td>
<td>SDI during pulse suppression and sensor-less</td>
<td>Becomes inactive</td>
<td>Remains active</td>
<td>-</td>
</tr>
</tbody>
</table>

#### Dependency:
Refer to: C01711

#### Note:
SDI: Safe Direction (safe motion direction)
SSM: Safe Speed Monitor (safety-relevant feedback signal from the velocity monitoring)

Re bit 00:
For bit = 1 and with the SSM safety function activated, the following applies:
- During pulse suppression, monitoring is switched off and the feedback signal has a 0 signal level.
For bit = 0 and with the SSM safety function activated, the following applies:
- Monitoring continues during pulse suppression. The feedback signal last displayed before pulse suppression is kept and the system goes into the STO state.

Re bit 08:
For bit = 1 and with the SDI safety function activated, the following applies:
- During pulse suppression, monitoring is switched off and the status signal indicates inactive.
For bit = 0 and with the SDI safety function activated, the following applies:
- Monitoring continues during pulse suppression. The status signal indicates active and the system goes into the STO state.

### p9311  
**Si Motion actual value sensing clock cycle (processor 2) / SI Mtn act clk P2**

Can be changed: C2(95)  
Data type: FloatingPoint32  
P-Group: Safety Integrated  
Not for motor type: -  
Min: 250.0000 [µs]  
Max: 8000.0000 [µs]  
Factory setting: 2000.0000 [µs]  
Can be changed: C2(95)  
Calculated: -  
Dynamic index: -  
Units group: -  
Scaling: -  
Func. diagram: -  
Unit selection: -  
Expert list: 1  
Description:
Sets the clock cycle time of the actual value sensing for safe motion monitoring.
Setting criteria if the motion monitoring functions are executed with an encoder:
- A slower clock cycle time reduces the maximum permissible velocity - however, it ensures a lower load of the Control Unit for safe actual value sensing.
- The maximum permissible velocity which, when exceeded, can mean that errors occur during safe actual value sensing, is displayed in r9730.
- Setting criteria if the motion monitoring functions are executed without an encoder:
- The actual value sensing clock cycle must be set to the same value as the current controller clock cycle (p0115).

Dependency:
Refer to: p9300, p9511  
Refer to: F01652  
Notice:
This parameter is overwritten by the copy function of the safety functions integrated in the drive.  
Note:
The parameter is only active for drive-based motion monitoring functions (p9601.2 = 1).  
The monitoring clock cycle from p9500 must be an integer multiple of this parameter.
In the case of motion monitoring functions with encoder, the clock cycle time for actual value sensing must be an integer multiple of the current controller clock cycle and at least 4 times slower than the current controller clock cycle. A factor of at least 8 is recommended. The value for the parameter must also be greater than or equal to 2 ms.
A change only becomes effective after a POWER ON.
### p9315
**SI Motion coarse position value configuration (processor 2) / SI Mtn s config P2**

**Description:**
Sets the encoder configuration for the redundant coarse position value. The encoder that is used for the safe motion monitoring functions on processor 2 must be parameterized in this parameter.

**Bit field:**
- **00** Incrementer: Yes
- **01** Encoder CRC least significant byte first: Yes
- **02** Redundant coarse position val. most significant bit left-aligned: Yes
- **16** DRIVE-CLiQ encoder: Yes

**Dependency:**
Refer to: p0474, p9515

### p9316
**SI Motion encoder configuration safety functions (processor 2) / SI Mtn enc cfg P2**

**Description:**
Sets the configuration for the encoder and position actual value. The encoder that is used for the safe motion monitoring functions on processor 2 must be parameterized in this parameter.

**Bit field:**
- **00** Encoder rotating/linear: Linear
- **01** Position actual value, sign change: Yes

**Dependency:**
Refer to: p0404, p0410, p9516

### p9317
**SI Motion linear scale grid division (processor 2) / SI Mtn grid P2**

**Description:**
Sets the grid division for a linear encoder. The encoder that is used for the safe motion monitoring functions on processor 2 must be parameterized in this parameter.

**Dependency:**
Refer to: p9316
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p9318 SI motion encoder pulses per revolution (processor 2) / SI Mtn p/rev P2</td>
<td>Sets the number of encoder pulses per revolution for rotary encoders.</td>
<td>Refer to: p0408, p9316</td>
<td>For safety functions that have not been enabled (p9301 = 0), the following applies: When booting, p9319 is automatically set the same as p0418. For safety functions that are enabled (p9301 &gt; 0), the following applies: p9319 is checked for agreement with p0418.</td>
</tr>
<tr>
<td>p9319 SI Motion fine resolution G1_XIST1 (processor 2) / SI Mtn G1_XIST1 P2</td>
<td>Sets the fine resolution for G1_XIST1 in bits.</td>
<td>Refer to: p0418</td>
<td>Refer to: F01670, F01671</td>
</tr>
<tr>
<td>p9320 SI Motion spindle pitch (processor 2) / SI Mtn sp_pitch P2</td>
<td>Sets the gear ratio between the encoder and load in mm/revolution for a linear axis with rotary encoder.</td>
<td>Refer to: p9520</td>
<td>The fourth decimal point can be rounded-off depending on the size of the entered number (from 3 places before the decimal point).</td>
</tr>
<tr>
<td>p9321[0...7] SI Motion gearbox enc (motor)/load denominator (processor 2) / SI Mtn gear den P2</td>
<td>Sets the denominator for the gearbox between the encoder (or motor in the case of encoderless monitoring functions) and the load.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Parameter

List of parameters

Index:  [0] = Gearbox 1
       [1] = Gearbox 2
       [7] = Gearbox 8

Dependency:  Refer to: p9322

Notice:  It is not possible to change over the gearbox stages. Gearbox 1 (index 0) is always active.

**p9322[0...7]**  SI Motion gearbox enc (motor)/load numerator (processor 2) / SI Mtn gear num P2

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gearbox</td>
<td>0...7</td>
</tr>
<tr>
<td>Description</td>
<td>Sets the numerator for the gearbox between the encoder (or motor in the case of encoderless monitoring functions) and the load.</td>
</tr>
<tr>
<td>Dependency</td>
<td>Refer to: p9321</td>
</tr>
<tr>
<td>Notice</td>
<td>It is not possible to change over the gearbox stages. Gearbox 1 (index 0) is always active.</td>
</tr>
<tr>
<td>Note</td>
<td>In the case of encoderless monitoring functions, the pole pair number must be multiplied by the numerator of the gearbox ratio.</td>
</tr>
<tr>
<td>Example</td>
<td>Gearbox ratio 1:4, pole pair number (r0313) = 2</td>
</tr>
<tr>
<td>Example</td>
<td>--&gt; p9321 = 1, p9322 = 8 (4 x 2)</td>
</tr>
</tbody>
</table>

---

**p9323**  SI Motion red. coarse position value valid bits (processor 2) / Valid bits P2

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gearbox</td>
<td>0...7</td>
</tr>
<tr>
<td>Description</td>
<td>Sets the number of valid bits of the redundant coarse position value.</td>
</tr>
<tr>
<td>Description</td>
<td>The encoder that is used for the safe motion monitoring functions on processor 2 must be parameterized in this parameter.</td>
</tr>
<tr>
<td>Dependency</td>
<td>Refer to: r0470, p9523</td>
</tr>
</tbody>
</table>
### List of parameters

#### p9324
**SI Motion redundant coarse pos. value fine resolution bits (P2) / SI Mtn fine bit P2**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Values</th>
<th>Device Groups</th>
<th>Units</th>
<th>Access Level</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Sets the number of valid bits for the fine resolution of the redundant coarse position value. The encoder that is used for the safe motion monitoring functions on processor 2 must be parameterized in this parameter.</td>
<td></td>
<td>Safety Integrated</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data type: Integer16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P-Group: Safety Integrated</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min -16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max 16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factory setting -2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access level: 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### p9325
**SI Motion redundant coarse position value relevant bits (P2) / Relevant bits P2**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Values</th>
<th>Device Groups</th>
<th>Units</th>
<th>Access Level</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Sets the number of relevant bits for the redundant coarse position value. The encoder that is used for the safe motion monitoring functions on processor 2 must be parameterized in this parameter.</td>
<td></td>
<td>Safety Integrated</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data type: Unsigned16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P-Group: Safety Integrated</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min 0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max 16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factory setting 16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access level: 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### p9328[0...11]
**SI Motion Sensor Module Node Identifier (processor 2) / SI Mtn SM Ident P2**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Values</th>
<th>Device Groups</th>
<th>Units</th>
<th>Access Level</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Sets the node identifier of the Sensor Module that is used by processor 2 for the motion monitoring functions.</td>
<td></td>
<td>Safety Integrated</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data type: Unsigned8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P-Group: Safety Integrated</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min 0000 hex</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max 0FF hex</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factory setting 0000 hex</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access level: 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### p9329
**SI Motion Gx_XIST1 coarse pos safe most significant bit (P2) / Gx_XIST1 MSB P2**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Values</th>
<th>Device Groups</th>
<th>Units</th>
<th>Access Level</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Sets the bit number for the safe most significant bit (MSB) of the Gx_XIST1 coarse position. The encoder that is used for the safe motion monitoring functions on processor 2 must be parameterized in this parameter.</td>
<td></td>
<td>Safety Integrated</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data type: Unsigned16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P-Group: Safety Integrated</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min 0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max 31</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factory setting 14</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access level: 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

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SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3
## List of parameters

### p9330  SI Motion standstill tolerance (processor 2) / SI Mtn SOS Tol P2

<table>
<thead>
<tr>
<th>Description</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sets the tolerance for the function &quot;Safe Operating Stop&quot; (SOS).</td>
<td>C2(95)</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>Dependency:</td>
<td>Refer to: p9530</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Notice:</td>
<td>Refer to: C01707</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### p9331[0...3]  SI Motion SLS limit values (processor 2) / SI Mtn SLS lim P2

<table>
<thead>
<tr>
<th>Description</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sets the limit values for the function &quot;Safely-Limited Speed&quot; (SLS).</td>
<td>C2(95)</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>Index:</td>
<td>[0] = Limit value SLS1</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[1] = Limit value SLS2</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[2] = Limit value SLS3</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[3] = Limit value SLP4</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Dependency:</td>
<td>Refer to: p9363, p9531</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Notice:</td>
<td>Refer to: C01714</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

### Notice:

This parameter is overwritten by the copy function of the safety functions integrated in the drive.

### Note:

SOS: Safe Operating Stop

SLS: Safely-Limited Speed
### List of parameters

#### p9331[0...3]
**SI Motion SLS limit values (processor 2) / SI Mtn SLS lim P2**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Processor Details</th>
<th>Can be changed:</th>
<th>Data type:</th>
<th>P-Group:</th>
<th>Not for motor type:</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SERVO_S110-CAN</td>
<td>C2(95)</td>
<td>FloatingPoint32</td>
<td>Safety Integrated</td>
<td>-</td>
<td>0.00 [rpm]</td>
<td>100000.00 [rpm]</td>
<td>2000.00 [rpm]</td>
</tr>
<tr>
<td></td>
<td>SERVO_S110-PN</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:**
Sets the limit values for the function "Safety-Limited Speed" (SLS).

**Index:**
- [0] = Limit value SLS1
- [1] = Limit value SLS2
- [2] = Limit value SLS3
- [3] = Limit value SLP4

**Dependency:**
Refer to: p9363, p9531
Refer to: C01714

**Notice:**
This parameter is overwritten by the copy function of the safety functions integrated in the drive.

**Note:**
SLS: Safely-Limited Speed

#### p9342
**SI Motion act. val. comparison tolerance (crossw.) (processor 2) / SI Mtn actV tol P2**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Processor Details</th>
<th>Can be changed:</th>
<th>Data type:</th>
<th>P-Group:</th>
<th>Not for motor type:</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SERVO_S110-CAN</td>
<td>C2(95)</td>
<td>FloatingPoint32</td>
<td>Safety Integrated</td>
<td>-</td>
<td>0.0010 [mm]</td>
<td>360.0000 [mm]</td>
<td>0.1000 [mm]</td>
</tr>
<tr>
<td></td>
<td>SERVO_S110-DP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SERVO_S110-PN</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:**
Sets the tolerance for the cross-check of the actual position between the two monitoring channels.

**Dependency:**
Refer to: p9542
Refer to: C01711

**Notice:**
This parameter is overwritten by the copy function of the safety functions integrated in the drive.

---

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SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3
**p9345**  
**SI Motion SSM filter time (processor 2) / SI Mtn SSM filt P2**  
SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
Can be changed: C2(95)  
Data type: FloatingPoint32  
P-Group: Safety Integrated  
Not for motor type: -  
Min [us]  
Max [us]  
Factory setting [us]  
Access level: 3  
Func. diagram: 2860  
Expert list: 1  

**Description:** Sets the filter time for the SSM feedback signal to detect standstill.

**Notice:** This parameter is overwritten by the copy function of the safety functions integrated in the drive.

**Note:** The filter time is effective only if the function is enabled (p9301.16 = p9501.16 = 1). The parameter is included in the crosswise data comparison of the two monitoring channels.

SSM: Safe Speed Monitor (safety-relevant feedback signal from the velocity monitoring)

**p9346**  
**SI Motion SSM velocity limit (processor 2) / SI Mtn SSM v_limP2**  
SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
Can be changed: C2(95)  
Data type: FloatingPoint32  
P-Group: Safety Integrated  
Not for motor type: -  
Min [mm/min]  
Max [mm/min]  
Factory setting [mm/min]  
Access level: 3  
Func. diagram: 2860  
Expert list: 1  

**Description:** Sets the velocity limit for the SSM feedback signal to detect standstill (n < nx). When this limit value is undershot, the signal "SSM feedback signal active" is set.

For p9368 = p9568 = 0 the value in p9346/p9546 is also applicable for the function "SAM".

**Dependency:** Refer to: p9546

**Caution:** The "SAM" function is switched out if the selected threshold value is undershot.

**Notice:** This parameter is overwritten by the copy function of the safety functions integrated in the drive.

**Note:** SAM: Safe Acceleration Monitor (safe acceleration monitoring)

SSM: Safe Speed Monitor (safety-relevant feedback signal from the velocity monitoring)

**p9346**  
**SI Motion SSM velocity limit (processor 2) / SI Mtn SSM v_limP2**  
SERVO_S110-CAN (Safety rot), SERVO_S110-DP (Safety rot), SERVO_S110-PN (Safety rot)  
Can be changed: C2(95)  
Data type: FloatingPoint32  
P-Group: Safety Integrated  
Not for motor type: -  
Min [rpm]  
Max [rpm]  
Factory setting [rpm]  
Access level: 3  
Func. diagram: 2860  
Expert list: 1  

**Description:** Sets the velocity limit for the SSM feedback signal to detect standstill (n < nx). When this limit value is undershot, the signal "SSM feedback signal active" is set.

For p9368 = p9568 = 0 the value in p9346/p9546 is also applicable for the function "SAM".

**Dependency:** Refer to: p9546

**Caution:** The "SAM" function is switched out if the selected threshold value is undershot.

**Notice:** This parameter is overwritten by the copy function of the safety functions integrated in the drive.

**Note:** SAM: Safe Acceleration Monitor (safe acceleration monitoring)

SSM: Safe Speed Monitor (safety-relevant feedback signal from the velocity monitoring)
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Notice</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p9347 SI Motion SSM velocity hysteresis (processor 2) / SI Mtn SSM Hyst P2</td>
<td>Sets the velocity hysteresis for the SSM feedback signal to detect standstill ((n &lt; nx)).</td>
<td>Refer to: C01711</td>
<td>This parameter is overwritten by the copy function of the safety functions integrated in the drive.</td>
<td>The velocity hysteresis is effective only if the function is enabled ((p9301.16 = p9501.16 = 1)). The parameter is included in the crosswise data comparison of the two monitoring channels. SSM: Safe Speed Monitor (safety-relevant feedback signal from the velocity monitoring)</td>
</tr>
<tr>
<td>p9348 SI Motion SBR actual velocity tolerance (processor 2) / SI Mtn SBR Tol P2</td>
<td>Sets the velocity tolerance for the &quot;SAM&quot; function.</td>
<td>Refer to: p9548</td>
<td>This parameter is overwritten by the copy function of the safety functions integrated in the drive.</td>
<td>SAM: Safe Acceleration Monitor (safe acceleration monitoring)</td>
</tr>
</tbody>
</table>
### Parameter List

#### Dependency:
- Refer to: p9548
- Refer to: C01706

#### Notice:
The parameter is overwritten by the copy function of the safety functions integrated in the drive.

#### Note:
- SAM: Safe Acceleration Monitor (safe acceleration monitoring)

### p9349
**SI Motion slip velocity tolerance (processor 2) / SI Mtn slip P2**

- **Can be changed:** C2(95)
- **Data type:** FloatingPoint32
- **P-Group:** Safety Integrated
- **Units group:** -
- **Not for motor type:** -

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>0.00 [mm/min]</td>
<td>6000.00 [mm/min]</td>
<td>6.00 [mm/min]</td>
</tr>
</tbody>
</table>

**Description:**
Sets the velocity tolerance that is used for a 2-encoder system in crosswise comparison between the two monitoring channels.

**Dependency:**
- Refer to: p9301, p9342, p9549

**Notice:**
This parameter is overwritten by the copy function of the safety functions integrated in the drive.

**Note:**
If the "actual value synchronization" is not enabled (p9301.3 = 0), then the value parameterized in p9342 is used as tolerance in the crosswise data comparison.

### p9349
**SI Motion slip velocity tolerance (processor 2) / SI Mtn slip P2**

- **Can be changed:** C2(95)
- **Data type:** FloatingPoint32
- **P-Group:** Safety Integrated
- **Units group:** -
- **Not for motor type:** -

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>0.00 [rpm]</td>
<td>6000.00 [rpm]</td>
<td>6.00 [rpm]</td>
</tr>
</tbody>
</table>

**Description:**
Sets the velocity tolerance that is used for a 2-encoder system in crosswise comparison between the two monitoring channels.

**Dependency:**
- Refer to: p9301, p9342, p9549

**Notice:**
This parameter is overwritten by the copy function of the safety functions integrated in the drive.

**Note:**
If the "actual value synchronization" is not enabled (p9301.3 = 0), then the value parameterized in p9342 is used as tolerance in the crosswise data comparison.

### p9351
**SI Motion SLS changeover delay time (processor 2) / SI Mtn SLS t P2**

- **Can be changed:** C2(95)
- **Data type:** FloatingPoint32
- **P-Group:** Safety Integrated
- **Units group:** -
- **Not for motor type:** -

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>0.00 [µs]</td>
<td>600000000.00 [µs]</td>
<td>100000.00 [µs]</td>
</tr>
</tbody>
</table>

**Description:**
Sets the delay time for the SLS changeover or for the changeover from SLS to SOS for the function "Safety-Limited Speed (SLS)."

When transitioning from a higher to a lower safely-limited velocity/speed stage or to the safe operating stop (SOS), within this delay time, the "old" velocity stage remains active.

Even if SLS or SOS is activated from non safety-related operation, then this delay is still applied.

**Dependency:**
- Refer to: p9551

**Notice:**
This parameter is overwritten by the copy function of the safety functions integrated in the drive.

**Note:**
- SLS: Safely-Limited Speed
- SOS: Safe Operating Stop
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Notice</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p9352</td>
<td>SI Motion transition time STOP C to SOS (processor 2) / SI Mtn t C-&gt;SOS P2</td>
<td>Sets the transition time from STOP C to &quot;Safe Operating Stop&quot; (SOS).</td>
<td>This parameter is overwritten by the copy function of the safety functions integrated in the drive.</td>
<td>SOS: Safe Operating Stop</td>
</tr>
<tr>
<td>p9353</td>
<td>SI Motion transition time STOP D to SOS (processor 2) / SI Mtn t D-&gt;SOS P2</td>
<td>Sets the transition time from STOP D to &quot;Safe Operating Stop&quot; (SOS).</td>
<td>This parameter is overwritten by the copy function of the safety functions integrated in the drive.</td>
<td></td>
</tr>
<tr>
<td>p9354</td>
<td>SI Motion transition time STOP E to SOS (processor 2) / SI Mtn t E-&gt;SOS P2</td>
<td>Sets the transition time from STOP E to &quot;Safe Operating Stop&quot; (SOS).</td>
<td>This parameter is overwritten by the copy function of the safety functions integrated in the drive.</td>
<td></td>
</tr>
<tr>
<td>p9355</td>
<td>SI Motion transition time STOP F to STOP B (processor 2) / SI Mtn t F-&gt;B P2</td>
<td>Sets the transition time from STOP F to STOP B.</td>
<td>This parameter is overwritten by the copy function of the safety functions integrated in the drive.</td>
<td></td>
</tr>
</tbody>
</table>
### Parameter List of parameters

#### p9356 SI Motion pulse suppression delay time (processor 2) / SI Mtn IL t_del P2

<table>
<thead>
<tr>
<th>Parameter Name</th>
<th>Description</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p9356</td>
<td>Sets the delay time for the safe pulse suppression after STOP B / SS1.</td>
<td>0.00 [µs]</td>
<td>600000000.00 [µs]</td>
<td>100000.00 [µs]</td>
</tr>
</tbody>
</table>

**Dependency:**
- Refer to: p9360, p9556
- Refer to: C01701

**Notice:**
This parameter is overwritten by the copy function of the safety functions integrated in the drive.

**Note:**
SS1: Safe Stop 1

#### p9357 SI Motion pulse suppression test time (processor 2) / SI Mtn IL t P2

<table>
<thead>
<tr>
<th>Parameter Name</th>
<th>Description</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p9357</td>
<td>Sets the time after which the pulses must have been suppressed when initiating the test stop.</td>
<td>0.00 [µs]</td>
<td>10000000.00 [µs]</td>
<td>100000.00 [µs]</td>
</tr>
</tbody>
</table>

**Dependency:**
- Refer to: p9557
- Refer to: C01798

**Notice:**
This parameter is overwritten by the copy function of the safety functions integrated in the drive.

#### p9358 SI Motion acceptance test mode time limit (processor 2) / SI Mtn acc t P2

<table>
<thead>
<tr>
<th>Parameter Name</th>
<th>Description</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p9358</td>
<td>Sets the maximum time for the acceptance test mode.</td>
<td>5000000.00 [µs]</td>
<td>100000000.00 [µs]</td>
<td>400000000.00 [µs]</td>
</tr>
</tbody>
</table>

**Dependency:**
- Refer to: p9558
- Refer to: C01799

**Notice:**
This parameter is overwritten by the copy function of the safety functions integrated in the drive.

#### p9360 SI Motion pulse suppression shutdown velocity (processor 2) / SI Mtn IL v_sh P2

<table>
<thead>
<tr>
<th>Parameter Name</th>
<th>Description</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p9360</td>
<td>Sets the shutdown velocity for pulse suppression.</td>
<td>0.00 [mm/min]</td>
<td>6000.00 [mm/min]</td>
<td>0.00 [mm/min]</td>
</tr>
</tbody>
</table>

**Dependency:**
- Refer to: p9356, p9560

**Notice:**
Below this velocity "standstill" is assumed and for STOP B / SS1, the pulses are suppressed (by changing to STOP A).

In the case of encoderless motion monitoring functions, the parameter must be > 0 (recommended value: 10).
### p9360 SI Motion pulse suppression shutdown speed (Motor Module) / SI Mtn IL n_sh MM

**Description:**
Sets the shutdown speed for the pulse suppression.
Below this speed "standstill" is assumed and for STOP B / SS1, the pulses are suppressed (by changing to STOP A).

**Dependency:**
Refer to: p9356, p9560

**Notice:**
This parameter is overwritten by the copy function of the safety functions integrated in the drive.

**Note:**
SS1: Safe Stop 1

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.00 [rpm]</td>
<td>6000.00 [rpm]</td>
<td>0.00 [rpm]</td>
</tr>
</tbody>
</table>

**Data type:** FloatingPoint32

**P-Group:** Safety Integrated

**Index:**
[0] = Limit value SLS1
[1] = Limit value SLS2
[2] = Limit value SLS3
[3] = Limit value SLP4

**Dependency:**
Refer to: p9331, p9380, p9563

**Notice:**
This parameter is overwritten by the copy function of the safety functions integrated in the drive.

**Note:**
The values 4 and 14 are not supported on Control Unit 305.

### p9363[0...3] SI Motion SLS stop response (processor 2) / SI Mtn SLS stop P2

**Description:**
Sets the stop response for the function "Safety-Limited Speed" (SLS).
These settings apply to the individual limit values for SLS.
In the case of encoderless motion monitoring (p9306 = 1), only a value of 0 or 1 is permitted.

**Value:**
0: STOP A
1: STOP B
2: STOP C
3: STOP D
4: STOP E
10: STOP A with delayed pulse suppression when the bus fails
11: STOP B with delayed pulse suppression when the bus fails
12: STOP C with delayed pulse suppression when the bus fails
13: STOP D with delayed pulse suppression when the bus fails
14: STOP E with delayed pulse suppression when the bus fails

**Index:**
[0] = Limit value SLS1
[1] = Limit value SLS2
[2] = Limit value SLS3
[3] = Limit value SLP4

**Dependency:**
Refer to: p9331, p9380, p9563

**Notice:**
This parameter is overwritten by the copy function of the safety functions integrated in the drive.

**Note:**
The values 4 and 14 are not supported on Control Unit 305.
SLS: Safety-Limited Speed
### p9364 SI Motion SDI tolerance (processor 2) / SI Mtn SDI tol P2

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Notice</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</strong>&lt;br&gt;(Safety rot),<strong>SERVO_S110-DP</strong>&lt;br&gt;(Safety rot),<strong>SERVO_S110-PN</strong>&lt;br&gt;(Safety rot)</td>
<td>Sets the tolerance for the function &quot;Safe motion direction&quot; (SDI). This motion in the monitored direction is still permissible before an alarm is initiated.</td>
<td>Refer to: p9365, p9366&lt;br&gt;Refer to: C30716</td>
<td>This parameter is overwritten by the copy function of the safety functions integrated in the drive. Sets the tolerance for the function &quot;Safe motion direction&quot; (SDI).</td>
<td>SDI: Safe Direction (safe motion direction)</td>
</tr>
</tbody>
</table>

**Can be changed:** C2(95)  
**Data type:** FloatingPoint32  
**P-Group:** Safety Integrated  
**Not for motor type:** -  
**Min:** 0.001 [mm]  
**Max:** 360.000 [mm]  
**Factory setting:** 12.000 [mm]  

**Access level:** 3  
**Calculated:** -  
**Dynamic index:** -  
**Func. diagram:** 2861  
**Units group:** -  
**Unit selection:** -  
**Scaling:** -  
**Expert list:** 1

### p9364 SI Motion SDI delay time (processor 2) / SI Mtn SDI t P2

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Notice</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</strong>&lt;br&gt;(Safety rot),<strong>SERVO_S110-DP</strong>&lt;br&gt;(Safety rot),<strong>SERVO_S110-PN</strong>&lt;br&gt;(Safety rot)</td>
<td>Sets the delay time for the function &quot;Safe motion direction&quot; (SDI). When selecting the SDI function, motion in the monitored direction is permissible as a maximum for this time; this means that this time can be used for braking existing motion.</td>
<td>Refer to: p9364, p9366&lt;br&gt;Refer to: C30716</td>
<td>This parameter is overwritten by the copy function of the safety functions integrated in the drive.</td>
<td>SDI: Safe Direction (safe motion direction)</td>
</tr>
</tbody>
</table>

**Can be changed:** C2(95)  
**Data type:** FloatingPoint32  
**P-Group:** Safety Integrated  
**Not for motor type:** -  
**Min:** 0.00 [µs]  
**Max:** 360.000 [µs]  
**Factory setting:** 100000.00 [µs]  

**Access level:** 3  
**Calculated:** -  
**Dynamic index:** -  
**Func. diagram:** 2861  
**Units group:** -  
**Unit selection:** -  
**Scaling:** -  
**Expert list:** 1

### p9365 SI Motion SDI delay time (processor 2) / SI Mtn SDI t P2

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Notice</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</strong>&lt;br&gt;(Safety rot),<strong>SERVO_S110-DP</strong>&lt;br&gt;(Safety rot),<strong>SERVO_S110-PN</strong>&lt;br&gt;(Safety rot)</td>
<td>Sets the delay time for the function &quot;Safe motion direction&quot; (SDI). When selecting the SDI function, motion in the monitored direction is permissible as a maximum for this time; this means that this time can be used for braking existing motion.</td>
<td>Refer to: p9364, p9366&lt;br&gt;Refer to: C30716</td>
<td>This parameter is overwritten by the copy function of the safety functions integrated in the drive.</td>
<td>SDI: Safe Direction (safe motion direction)</td>
</tr>
</tbody>
</table>

**Can be changed:** C2(95)  
**Data type:** FloatingPoint32  
**P-Group:** Safety Integrated  
**Not for motor type:** -  
**Min:** 0.00 [µs]  
**Max:** 600000000.00 [µs]  
**Factory setting:** 100000.00 [µs]  

**Access level:** 3  
**Calculated:** -  
**Dynamic index:** -  
**Func. diagram:** 2861  
**Units group:** -  
**Unit selection:** -  
**Scaling:** -  
**Expert list:** 1
**p9366** SI Motion SDI stop response (processor 2) / SI Mtn SDI Stop P2

**SERVO_S110-CAN, SERVO_S110-EP, SERVO_S110-PN**

**Data type:** Integer16  
**Dynamic index:** -  
**Not for motor type:** -  
**Scaling:** -  
**Expert list:** 1

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>14</td>
<td>1</td>
</tr>
</tbody>
</table>

**Description:** Sets the stop response for the function "Safe motion direction" (SDI). This setting applies to both directions of motion.

**Value:**
- 0: STOP A
- 1: STOP B
- 2: STOP C
- 3: STOP D
- 4: STOP E
- 10: STOP A with delayed pulse suppression when the bus fails
- 11: STOP B with delayed pulse suppression when the bus fails
- 12: STOP C with delayed pulse suppression when the bus fails
- 13: STOP D with delayed pulse suppression when the bus fails
- 14: STOP E with delayed pulse suppression when the bus fails

**Dependency:**
- Refer to: p9364, p9365  
- C30716

**Notice:** This parameter is overwritten by the copy function of the safety functions integrated in the drive.

**Note:** SDI: Safe Direction (safe motion direction)

---

**p9368** SI Motion SAM velocity limit (processor 2) / SI Mtn SAM v_limP2

**SERVO_S110-CAN, SERVO_S110-EP, SERVO_S110-PN**

**Data type:** FloatingPoint32  
**Dynamic index:** -  
**Not for motor type:** -  
**Scaling:** -  
**Expert list:** 1

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.00 [mm/min]</td>
<td>1000.00 [mm/min]</td>
<td>0.00 [mm/min]</td>
</tr>
</tbody>
</table>

**Description:** Sets the velocity tolerance limit for the "SAM" function. SAM is de-activated once the set velocity limit has been undershot.

**Notice:** This parameter is overwritten by the copy function of the safety functions integrated in the drive.

**Note:** SAM: Safe Acceleration Monitor (safe acceleration monitoring)  
SSM: Safe Speed Monitor (safety-relevant feedback signal from the velocity monitoring)  
For p9568 = p9368 = 0, the following applies:  
The value in p9546/p9346 (SSM) is applied as the velocity limit for SAM.
**Note:**

SAM: Safe Acceleration Monitor (safe acceleration monitoring)

SSM: Safe Speed Monitor (safety-relevant feedback signal from the velocity monitoring)

For p9568 = p9368 = 0, the following applies:

The value in p9546/p9346 (SSM) is applied as the velocity limit for SAM.

---

**p9370**

**SI Motion acceptance test mode (processor 2) / SI Mtn acc_mod P2**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
<th>Value</th>
<th>Dependency</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN</td>
<td></td>
<td>Can be changed: U, T</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-DP</td>
<td></td>
<td>Calculated: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-PN</td>
<td></td>
<td>Access level: 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data type: Integer16</td>
<td></td>
<td>Dynamic index: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P-Group: Safety Integrated</td>
<td></td>
<td>Units group: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td></td>
<td>Scaling: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0000 hex</td>
<td>00AC hex</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:**

Setting to select and de-select the acceptance test mode.

**Value:**

0: [00 hex] De-select the acceptance test mode

172: [AC hex] Select the acceptance test mode

**Dependency:**

Refer to: p9358, r9371

Refer to: C01799

**Note:**

Acceptance test mode can only be selected if the motion monitoring functions, which are integrated in the drives, are enabled (p9801.2/p9801.2).

---

**r9371**

**SI Motion acceptance test status (processor 2) / SI Mtn acc_stat P2**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
<th>Value</th>
<th>Dependency</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN</td>
<td></td>
<td>Can be changed: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-DP</td>
<td></td>
<td>Calculated: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-PN</td>
<td></td>
<td>Access level: 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data type: Integer16</td>
<td></td>
<td>Dynamic index: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P-Group: Safety Integrated</td>
<td></td>
<td>Units group: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td></td>
<td>Scaling: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0000 hex</td>
<td>00AC hex</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:**

Displays the status of the acceptance test mode.

**Value:**

0: [00 hex] Acc_mode inactive

12: [0C hex] Acc_mode not possible due to POWER ON fault

13: [0D hex] Acc_mode not possible due to incorrect ID in p9370

15: [0F hex] Acc_mode not possible due to expired Acc_timer

172: [AC hex] Acc_mode active

**Dependency:**

Refer to: p9358, p9370

Refer to: C01799

---

**p9380**

**SI Motion pulse suppression delay bus failure (processor 2) / SI Mtn t to IL P2**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
<th>Value</th>
<th>Dependency</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN</td>
<td></td>
<td>Can be changed: C2(95)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-DP</td>
<td></td>
<td>Calculated: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-PN</td>
<td></td>
<td>Access level: 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td></td>
<td>Dynamic index: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P-Group: Safety Integrated</td>
<td></td>
<td>Units group: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td></td>
<td>Scaling: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.00 [µs]</td>
<td>800000.00 [µs]</td>
<td>0.00 [µs]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:**

Sets the delay time after which the pulses are safely suppressed after a bus failure.

**Dependency:**

Refer to: p9363

**Notice:**

This parameter is overwritten by the copy function of the safety functions integrated in the drive.
### List of parameters

**p9381 SI Motion brake ramp reference value (processor 2) / SI Mtn ramp ref P2**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
<th>Data type:</th>
<th>Dynamic index:</th>
<th>Func. diagram:</th>
<th>P-Group:</th>
<th>Units group:</th>
<th>Expert list:</th>
</tr>
</thead>
<tbody>
<tr>
<td>p9381</td>
<td>Sets the reference value to define the brake ramp. The rate of rise of the brake ramp depends upon p9381 (reference value) and p9383 (monitoring time).</td>
<td>C2(95)</td>
<td>-</td>
<td>3</td>
<td>FloatingPoint32</td>
<td>-</td>
<td>-</td>
<td>Safety Integrated</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Min</td>
<td>600.0000 [mm/min]</td>
<td>Max</td>
<td>24000.0000 [mm/min]</td>
<td>Factory setting</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max</td>
<td>1500.0000 [mm/min]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Notice</td>
<td>This parameter is overwritten by the copy function of the safety functions integrated in the drive.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dependency</td>
<td>Refer to: p9382, p9383</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**p9382 SI Motion brake ramp delay time (processor 2) / SI Mtn rp t_del P2**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
<th>Data type:</th>
<th>Dynamic index:</th>
<th>Func. diagram:</th>
<th>P-Group:</th>
<th>Units group:</th>
<th>Expert list:</th>
</tr>
</thead>
<tbody>
<tr>
<td>p9382</td>
<td>Sets the delay time for monitoring the brake ramp. Monitoring of the brake ramp starts once the delay time has elapsed.</td>
<td>C2(95)</td>
<td>-</td>
<td>3</td>
<td>FloatingPoint32</td>
<td>-</td>
<td>-</td>
<td>Safety Integrated</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Min</td>
<td>10000.00 [µs]</td>
<td>Max</td>
<td>99000000.00 [µs]</td>
<td>Factory setting</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max</td>
<td>25000000.00 [µs]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Notice</td>
<td>This parameter is overwritten by the copy function of the safety functions integrated in the drive.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dependency</td>
<td>Refer to: p9381, p9383</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**p9383 SI Motion brake ramp monitoring time (processor 2) / SI Mtn rp t_mon P2**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
<th>Data type:</th>
<th>Dynamic index:</th>
<th>Func. diagram:</th>
<th>P-Group:</th>
<th>Units group:</th>
<th>Expert list:</th>
</tr>
</thead>
<tbody>
<tr>
<td>p9383</td>
<td>Sets the monitoring time to define the brake ramp. The rate of rise of the brake ramp depends upon p9381 (reference value) and p9383 (monitoring time).</td>
<td>C2(95)</td>
<td>-</td>
<td>3</td>
<td>FloatingPoint32</td>
<td>-</td>
<td>-</td>
<td>Safety Integrated</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Min</td>
<td>500.00 [ms]</td>
<td>Max</td>
<td>1000000.00 [ms]</td>
<td>Factory setting</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max</td>
<td>10000.00 [ms]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Notice</td>
<td>This parameter is overwritten by the copy function of the safety functions integrated in the drive.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dependency</td>
<td>Refer to: p9381, p9382</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Parameter List

#### p9386
**SI Motion delay time of the evaluation sensorless (processor 2) / SI Mtn t_del SL MM**

- **SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**
- **Can be changed:** C2(95)
- **Data type:** FloatingPoint32
- **P-Group:** Safety Integrated
- **Not for motor type:** -
- **Min:** 5.00 [ms]
- **Max:** 1000.00 [ms]
- **Factory setting:** 100.00 [ms]

**Description:**
Sets the evaluation delay for encoderless actual value sensing after pulse enable. The value should be greater than or equal to the motor magnetizing time.

**Dependency:**
Refer to: C01711

#### p9387
**SI Motion act val sensing sensorless filter time (processor 2) / SI Mtn SL filt P2**

- **SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**
- **Can be changed:** C2(95)
- **Data type:** FloatingPoint32
- **P-Group:** Safety Integrated
- **Not for motor type:** -
- **Min:** 0.00 [µs]
- **Max:** 100000.00 [µs]
- **Factory setting:** 25000.00 [µs]

**Description:**
Sets the filter time for smoothing the actual value with sensorless actual value sensing.

**Notice:**
This parameter is overwritten by the copy function of the safety functions integrated in the drive.

**Note:**
This parameter is only effective for encoderless actual value sensing (p9306/p9506 = 1).

#### p9388
**SI Motion act val sensing sensorless min current (processor 2) / SI Mtn SL I_min P2**

- **SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**
- **Can be changed:** C2(95)
- **Data type:** FloatingPoint32
- **P-Group:** Safety Integrated
- **Not for motor type:** -
- **Min:** 0.00 [%]
- **Max:** 100.00 [%]
- **Factory setting:** 10.00 [%]

**Description:**
Sets the minimum current for encoderless actual value sensing in reference to 10 mA (i.e. when 1 % = 10 mA).
- The value must be increased if C30711 has occurred with message value 1042.
- The value must be decreased if C30711 has occurred with message value 1041.

**Dependency:**
Refer to: C30711

**Notice:**
This parameter is overwritten by the copy function of the safety functions integrated in the drive.

**Note:**
This parameter is only effective for encoderless actual value sensing (p9306/p9506 = 1).

#### p9389
**SI Motion voltage tolerance acceleration (processor 2) / SI Mtn U tol P2**

- **SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**
- **Can be changed:** C2(95)
- **Data type:** FloatingPoint32
- **P-Group:** Safety Integrated
- **Not for motor type:** -
- **Min:** 10.00 [%]
- **Max:** 100.00 [%]
- **Factory setting:** 100.00 [%]

**Description:**
Sets the voltage tolerance for suppressing acceleration peaks.
Increasing this percentage value means that voltage peaks will need to have a higher amplitude during acceleration procedures if they are not to affect actual value sensing.
- The value must be increased if C30711 has occurred with message value 1042.
- The value must be lowered if acceleration procedures have led to an excessive Safety actual velocity.

**Dependency:**
Refer to: C30711

**Notice:**
This parameter is overwritten by the copy function of the safety functions integrated in the drive.

**Note:**
This parameter is only effective for encoderless actual value sensing (p9306/p9506 = 1).
### r9398[0...1]  
**SI Motion actual checksum SI parameters (processor 2) / SI Mtn act CRC P2**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Index</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
</table>
| SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN | Displays the checksum over the checked Safety Integrated parameters of the motion monitoring functions (actual checksum) on processor 2. | [0] = Checksum over SI parameters for motion monitoring  
[1] = Checksum over SI parameters with hardware reference | Refer to: p9399 | SI: Safety Integrated |

### p9399[0...1]  
**SI Motion setpoint checksum SI parameters (processor 2) / SI Mtn setp CRC P2**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Index</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
</table>
| SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN | Sets the checksum over the checked Safety Integrated parameters of the motion monitoring functions (actual checksum) on processor 2. | [0] = Checksum over SI parameters for motion monitoring  
[1] = Checksum over SI parameters with hardware reference | Refer to: r9398 | SI: Safety Integrated |

### p9400  
**Safely remove memory card / Mem_card rem**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Index</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>CU_S110-CAN, CU_S110-DP, CU_S110-PN</td>
<td>Setting and display when memory card is &quot;removed safely&quot;.</td>
<td></td>
<td>Refer to: r9401</td>
<td>SI: Safety Integrated</td>
</tr>
</tbody>
</table>

**Procedure:**

- Setting p9400 = 2 results in a value of 3
  
  --> The memory card can be removed safely. After removal the value sets itself to 0 automatically.

- Setting p9400 = 2 results in a value of 100
  
  --> The memory card cannot be removed safely. Removal may destroy the file system on the memory card. It may be necessary to set p9400 = 2 again.

**Value:**

- 0: No memory card inserted
- 1: Memory card inserted
- 2: Request "safe removal" of the memory card
- 3: "Safe removal" possible
- 100: "Safe removal" not possible due to access

**Caution:**

Removing the memory card without a request (p9400 = 2) and confirmation (p9400 = 3) may destroy the file system on the memory card. The memory card will then no longer work properly and must be repaired.

**Note:**

The status when the memory card is being "removed safely" is shown in r9401.

Re value = 0, 1, 3, 100:  
These values can only be displayed, not set.
**r9401**  
**Safely remove memory card status / Mem_card rem stat**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Can be changed</th>
<th>Calculated</th>
<th>Access level</th>
</tr>
</thead>
<tbody>
<tr>
<td>CU_S110-CAN, CU_S110-DP, CU_S110-PN</td>
<td>Displays the status of the memory card.</td>
<td>-</td>
<td>-</td>
<td>2</td>
</tr>
</tbody>
</table>

**Dependency:** Refer to: p9400

**Note:**
- Bit 1/0 = 0/0: No memory card inserted (corresponds to p9400 = 0).
- Bit 1/0 = 0/1: “Safe removal” possible (corresponds to p9400 = 3).
- Bit 1/0 = 1/0: Status not possible.
- Bit 1/0 = 1/1: Memory card inserted (corresponds to p9400 = 1, 2, 100).

**Bit field:**

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Memory card inserted</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>01</td>
<td>Memory card activated</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
</tbody>
</table>


**r9406[0...19]**  
**PS file parameter number parameter not transferred / PS par_no n transf**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Can be changed</th>
<th>Calculated</th>
<th>Access level</th>
</tr>
</thead>
<tbody>
<tr>
<td>All objects</td>
<td>Displays the parameters that were not able to be transferred when reading the parameter back-up files (PS files) from the non-volatile memory (e.g. memory card).</td>
<td>-</td>
<td>-</td>
<td>4</td>
</tr>
</tbody>
</table>

**Dependency:** Refer to: r9407, r9408

**Note:**
- r9406[0] = 0 --> All of the parameter values were able to be transferred error-free.
- r9406[0...19] > 0 --> Indicates the parameter number in the following cases:
  - parameter, whose value was not able to be completely accepted.
  - indexed parameter, where at least 1 index was not able to be accepted. The first index that is not transferred is displayed in r9407.

**r9407[0...19]**  
**PS file parameter index parameter not transferred / PS parameter index**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Can be changed</th>
<th>Calculated</th>
<th>Access level</th>
</tr>
</thead>
<tbody>
<tr>
<td>All objects</td>
<td>Displays the first index of the parameters that could not be transferred when the parameter backup files (PS files) were read from the non-volatile memory (e.g. memory card). If, from an indexed parameter, at least one index was not able to be transferred, then the parameter number is displayed in r9406[n] and the first index that was not transferred is displayed in r9407[n].</td>
<td>-</td>
<td>-</td>
<td>4</td>
</tr>
</tbody>
</table>
**r9406[0] = 0**
--> All of the parameter values were able to be transferred error-free.

**r9406[n] > 0**
--> Displays r9407[n] the first index of the parameter number r9406[n] that was not transferred.

**Dependency:**
Refer to: r9406, r9408

**Note:**
All indices from r9406 to r9408 designate the same parameter.
r9406[x] parameter number, parameter not accepted
r9407[x] parameter index, parameter not accepted
r9408[x] fault code, parameter not accepted

<table>
<thead>
<tr>
<th>r9408[0...19]</th>
<th>PS file fault code parameter not transferred / PS fault code</th>
</tr>
</thead>
<tbody>
<tr>
<td>All objects</td>
<td>Can be changed: - Calculated: - Access level: 4</td>
</tr>
<tr>
<td>Data type:</td>
<td>Unssigned16</td>
</tr>
<tr>
<td>Dynamic index:</td>
<td>-</td>
</tr>
<tr>
<td>Units group:</td>
<td>-</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td>Description:</td>
<td>Only for internal Siemens service purposes.</td>
</tr>
<tr>
<td>Dependency:</td>
<td>Refer to: r9406, r9407</td>
</tr>
<tr>
<td>Note:</td>
<td>All indices from r9406 to r9408 designate the same parameter.</td>
</tr>
</tbody>
</table>
r9406[x] parameter number, parameter not accepted
r9407[x] parameter index, parameter not accepted
r9408[x] fault code, parameter not accepted

<table>
<thead>
<tr>
<th>r9409</th>
<th>Number of parameters to be saved / Qty par to save</th>
</tr>
</thead>
<tbody>
<tr>
<td>All objects</td>
<td>Can be changed: - Calculated: - Access level: 4</td>
</tr>
<tr>
<td>Data type:</td>
<td>Unssigned16</td>
</tr>
<tr>
<td>Dynamic index:</td>
<td>-</td>
</tr>
<tr>
<td>Units group:</td>
<td>-</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td>Description:</td>
<td>Displays the number of modified parameters and those that have still not be saved for this drive object.</td>
</tr>
<tr>
<td>Dependency:</td>
<td>Refer to: p0971, p0977</td>
</tr>
<tr>
<td>Note:</td>
<td>The modified parameters that still need to be saved are internally listed in r9410 ... r9419.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>r9450[0...29]</th>
<th>Reference value change parameter with unsuccessful calculation / Ref_chg par n poss</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN,</td>
<td>Can be changed: - Calculated: - Access level: 2</td>
</tr>
<tr>
<td>SERVO_S110-DP,</td>
<td>Dynamic index: - Func. diagram: -</td>
</tr>
<tr>
<td>SERVO_S110-PN</td>
<td>Units group: - Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td>Description:</td>
<td>Displays the parameters for which the re-calculation was unsuccessful after an internal system reference value change.</td>
</tr>
<tr>
<td>Dependency:</td>
<td>Refer to: F07086</td>
</tr>
</tbody>
</table>
### Parameter List of parameters

<table>
<thead>
<tr>
<th>r9451[0...29]</th>
<th>Units changeover adapted parameters / Unit_chngov par</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Can be changed: - Calculated: - Access level: 1</td>
</tr>
<tr>
<td>Data type: Unsigned32</td>
<td>Dynamic index: - Func. diagram: -</td>
</tr>
<tr>
<td>P-Group: -</td>
<td>Units group: - Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: - Expert list: 1</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td>Description:</td>
<td>Displays the parameters whose parameter would have to be changed during a units changeover.</td>
</tr>
<tr>
<td>Dependency:</td>
<td>Refer to: F07088</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>r9481</th>
<th>Number of BICO interconnections / BICO count</th>
</tr>
</thead>
<tbody>
<tr>
<td>All objects</td>
<td>Can be changed: - Calculated: - Access level: 3</td>
</tr>
<tr>
<td>Data type: Unsigned16</td>
<td>Dynamic index: - Func. diagram: -</td>
</tr>
<tr>
<td>P-Group: Commands</td>
<td>Units group: - Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: - Expert list: 0</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td>Description:</td>
<td>Displays the number of BICO interconnections (signal sinks).</td>
</tr>
<tr>
<td>Dependency:</td>
<td>Refer to: r9482, r9483</td>
</tr>
<tr>
<td>Note:</td>
<td>The selected BICO interconnections should be entered into r9482 and r9483.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>r9482[0...n]</th>
<th>BICO interconnections BI/CI parameters / BICO BI/CI par</th>
</tr>
</thead>
<tbody>
<tr>
<td>All objects</td>
<td>Can be changed: - Calculated: - Access level: 3</td>
</tr>
<tr>
<td>Data type: Unsigned32</td>
<td>Dynamic index: r9481 Func. diagram: -</td>
</tr>
<tr>
<td>P-Group: Commands</td>
<td>Units group: - Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: - Expert list: 0</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td>Description:</td>
<td>Displays the signal sinks (binector/connector inputs, BI/CI parameters).</td>
</tr>
<tr>
<td>Dependency:</td>
<td>Refer to: r9481, r9483</td>
</tr>
<tr>
<td>Note:</td>
<td>The list is sorted according to signal sources. The number of BICO interconnections is displayed in r9481.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>r9483[0...n]</th>
<th>BICO interconnections BO/CO parameters / BICO BO/CO par</th>
</tr>
</thead>
<tbody>
<tr>
<td>All objects</td>
<td>Can be changed: - Calculated: - Access level: 3</td>
</tr>
<tr>
<td>Data type: Unsigned32</td>
<td>Dynamic index: r9481 Func. diagram: -</td>
</tr>
<tr>
<td>P-Group: Commands</td>
<td>Units group: - Unit selection: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: - Expert list: 0</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td>Description:</td>
<td>Displays the signal sources (binector/connector outputs, BO/CO parameters).</td>
</tr>
<tr>
<td>Dependency:</td>
<td>Refer to: r9481, r9482</td>
</tr>
<tr>
<td>Note:</td>
<td>The list is sorted according to signal sources. The number of BICO interconnections is displayed in r9481.</td>
</tr>
</tbody>
</table>
### p9484 BICO interconnections search signal source / BICO S_src srch

<table>
<thead>
<tr>
<th>Description</th>
<th>Dependency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sets the signal source (BO/CO parameter, BICO coded) to search in the signal sinks.</td>
<td>Refer to: r9481, r9482, r9483, r9485, r9486</td>
</tr>
</tbody>
</table>

#### Description:
Sets the signal source (BO/CO parameter, BICO coded) to search in the signal sinks.

#### Dependency:
Refer to: r9481, r9482, r9483, r9485, r9486

#### Note:
The signal source to be searched is set in p9484 (BICO-coded).

#### Data type:
Unsigned32

#### Access level:
3

#### Min Max Factory setting
0 4294967295 0

---

### r9485 BICO interconnections signal source search count / BICO S_src srchQty

<table>
<thead>
<tr>
<th>Description</th>
<th>Dependency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Displays the number of BICO interconnections to the signal sink being searched for.</td>
<td>Refer to: r9481, r9482, r9483, p9484, r9486</td>
</tr>
</tbody>
</table>

#### Description:
Displays the number of BICO interconnections to the signal sink being searched for.

#### Dependency:
Refer to: r9481, r9482, r9483, p9484, r9486

#### Note:
The signal source to be searched is set in p9484 (BICO-coded).

#### Data type:
Unsigned16

#### Access level:
3

#### Min Max Factory setting
- - -

---

### r9486 BICO interconnections signal source search first index / BICO S_src srchIdx

<table>
<thead>
<tr>
<th>Description</th>
<th>Dependency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Displays the first index of the signal source being searched for.</td>
<td>Refer to: r9481, r9482, r9483, r9485</td>
</tr>
</tbody>
</table>

#### Description:
Displays the first index of the signal source being searched for.

#### Dependency:
Refer to: r9481, r9482, r9483, r9485, p9484, r9486

#### Note:
The signal source to be searched is set in p9484 (BICO-coded).

#### Data type:
Unsigned16

#### Access level:
3

#### Min Max Factory setting
- - -

---

### p9500 SI Motion monitoring clock cycle (processor 1) / SI Mtn clock P1

<table>
<thead>
<tr>
<th>Description</th>
<th>Dependency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sets the monitoring clock cycle for safe motion monitoring.</td>
<td>Refer to: r2064, p9511, F01652</td>
</tr>
</tbody>
</table>

#### Description:
Sets the monitoring clock cycle for safe motion monitoring.

#### Dependency:
Refer to: r2064, p9511

#### Note:
A change only becomes effective after a POWER ON.

The monitoring clock cycle must be a multiple of the actual value sensing clock cycle in p9511 (dbSI) or of the DP clock cycle (ncSI).
Parameter

List of parameters

p9501 SI Motion enable safety functions (processor 1) / SI Mtn enable P1

<p>| Description: | Sets the enable signals for the safe motion monitoring. |</p>
<table>
<thead>
<tr>
<th>Bit field:</th>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Enable SOS/SLS (SBH/SG)</td>
<td>Enable</td>
<td>Inhibit</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Enable SSM hysteresis and filtering</td>
<td>Enable</td>
<td>Inhibit</td>
<td>2860</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Enable SDI</td>
<td>Enable</td>
<td>Inhibit</td>
<td>2861</td>
<td></td>
</tr>
</tbody>
</table>

Dependency: Refer to: F01682, F01683

Note: A change only becomes effective after a POWER ON.

SDI: Safe Direction (safe motion direction)
SLS: Safely-Limited Speed
SOS: Safe Operating Stop
SSM: Safe Speed Monitor (safety-relevant feedback signal from the velocity monitoring)

p9502 SI Motion axis type (processor 1) / SI Mtn ax type P1

| Description: | Sets the axis type (linear axis or rotary axis/spindle). |
| Value: | 0: Linear axis |
| 1: Rot axis/spindle |

Note: For the commissioning software, after changing over the axis type, the units dependent on the axis type are only updated after a project upload.

A change only becomes effective after a POWER ON.

p9503 SI Motion SCA (SN) enable (Control Unit) / SI Mtn SCA enab

<p>| Description: | Setting to enable the function &quot;Safe Cam&quot; (SCA). |</p>
<table>
<thead>
<tr>
<th>Bit field:</th>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Enable SCA1 (SN1)</td>
<td>Enable</td>
<td>Inhibit</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>01</td>
<td>Enable SCA2 (SN2)</td>
<td>Enable</td>
<td>Inhibit</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>02</td>
<td>Enable SCA3 (SN3)</td>
<td>Enable</td>
<td>Inhibit</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>03</td>
<td>Enable SCA4 (SN4)</td>
<td>Enable</td>
<td>Inhibit</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>04</td>
<td>Enable SCA5 (SN5)</td>
<td>Enable</td>
<td>Inhibit</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>05</td>
<td>Enable SCA6 (SN6)</td>
<td>Enable</td>
<td>Inhibit</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>06</td>
<td>Enable SCA7 (SN7)</td>
<td>Enable</td>
<td>Inhibit</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>07</td>
<td>Enable SCA8 (SN8)</td>
<td>Enable</td>
<td>Inhibit</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>08</td>
<td>Enable SCA9 (SN9)</td>
<td>Enable</td>
<td>Inhibit</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>09</td>
<td>Enable SCA10 (SN10)</td>
<td>Enable</td>
<td>Inhibit</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>
### List of parameters

#### Dependency:
- Refer to: p9501
- Refer to: F01686

#### Note:
The "Safe Cam" function (SCA) can either be enabled using p9501 or p9503.

SCA: Safe Cam / SN: Safe software cam

### p9505
**SI Motion SCA (SN) modulo value (Control Unit) / SI Mtn SCA modulo**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Enable SCA11 (SN11)</td>
<td>Enable</td>
</tr>
<tr>
<td>1</td>
<td>Enable SCA12 (SN12)</td>
<td>Enable</td>
</tr>
<tr>
<td>2</td>
<td>Enable SCA13 (SN13)</td>
<td>Enable</td>
</tr>
<tr>
<td>3</td>
<td>Enable SCA14 (SN14)</td>
<td>Enable</td>
</tr>
<tr>
<td>4</td>
<td>Enable SCA15 (SN15)</td>
<td>Enable</td>
</tr>
<tr>
<td>5</td>
<td>Enable SCA16 (SN16)</td>
<td>Enable</td>
</tr>
<tr>
<td>6</td>
<td>Enable ESCA17 (SN17)</td>
<td>Enable</td>
</tr>
<tr>
<td>7</td>
<td>Enable SCA18 (SN18)</td>
<td>Enable</td>
</tr>
<tr>
<td>8</td>
<td>Enable SCA19 (SN19)</td>
<td>Enable</td>
</tr>
<tr>
<td>9</td>
<td>Enable SCA20 (SN20)</td>
<td>Enable</td>
</tr>
<tr>
<td>10</td>
<td>Enable SCA21 (SN21)</td>
<td>Enable</td>
</tr>
<tr>
<td>11</td>
<td>Enable SCA22 (SN22)</td>
<td>Enable</td>
</tr>
<tr>
<td>12</td>
<td>Enable SCA23 (SN23)</td>
<td>Enable</td>
</tr>
<tr>
<td>13</td>
<td>Enable SCA24 (SN24)</td>
<td>Enable</td>
</tr>
<tr>
<td>14</td>
<td>Enable SCA25 (SN25)</td>
<td>Enable</td>
</tr>
<tr>
<td>15</td>
<td>Enable SCA26 (SN26)</td>
<td>Enable</td>
</tr>
<tr>
<td>16</td>
<td>Enable SCA27 (SN27)</td>
<td>Enable</td>
</tr>
<tr>
<td>17</td>
<td>Enable SCA28 (SN28)</td>
<td>Enable</td>
</tr>
<tr>
<td>18</td>
<td>Enable SCA29 (SN29)</td>
<td>Enable</td>
</tr>
<tr>
<td>19</td>
<td>Enable SCA30 (SN30)</td>
<td>Enable</td>
</tr>
</tbody>
</table>

**Description:**
Sets the modulo range of the safe position actual value in degrees for the function "Safe Cam" (SCA) for rotary axes.

**Dependency:**
Refer to: p9536, p9537

**Note:**
- Can be changed: U, T
- Calculated: -
- Access level: 4
- Data type: FloatingPoint32
- Dynamic index: -
- Func. diagram: -
- P-Group: Safety Integrated
- Units group: -
- Unit selection: -
- Not for motor type: -
- Scaling: -
- Expert list: 1

### p9506
**SI Motion function specification (processor 1) / SI Mtn fct_spc P1**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Enable SCA31 (SN31)</td>
<td>Enable</td>
</tr>
<tr>
<td>1</td>
<td>Enable SCA32 (SN32)</td>
<td>Enable</td>
</tr>
<tr>
<td>2</td>
<td>Enable SCA33 (SN33)</td>
<td>Enable</td>
</tr>
<tr>
<td>3</td>
<td>Enable SCA34 (SN34)</td>
<td>Enable</td>
</tr>
<tr>
<td>4</td>
<td>Enable SCA35 (SN35)</td>
<td>Enable</td>
</tr>
<tr>
<td>5</td>
<td>Enable SCA36 (SN36)</td>
<td>Enable</td>
</tr>
<tr>
<td>6</td>
<td>Enable SCA37 (SN37)</td>
<td>Enable</td>
</tr>
<tr>
<td>7</td>
<td>Enable SCA38 (SN38)</td>
<td>Enable</td>
</tr>
<tr>
<td>8</td>
<td>Enable SCA39 (SN39)</td>
<td>Enable</td>
</tr>
<tr>
<td>9</td>
<td>Enable SCA40 (SN40)</td>
<td>Enable</td>
</tr>
<tr>
<td>10</td>
<td>Enable SCA41 (SN41)</td>
<td>Enable</td>
</tr>
<tr>
<td>11</td>
<td>Enable SCA42 (SN42)</td>
<td>Enable</td>
</tr>
<tr>
<td>12</td>
<td>Enable SCA43 (SN43)</td>
<td>Enable</td>
</tr>
<tr>
<td>13</td>
<td>Enable SCA44 (SN44)</td>
<td>Enable</td>
</tr>
<tr>
<td>14</td>
<td>Enable SCA45 (SN45)</td>
<td>Enable</td>
</tr>
<tr>
<td>15</td>
<td>Enable SCA46 (SN46)</td>
<td>Enable</td>
</tr>
<tr>
<td>16</td>
<td>Enable SCA47 (SN47)</td>
<td>Enable</td>
</tr>
<tr>
<td>17</td>
<td>Enable SCA48 (SN48)</td>
<td>Enable</td>
</tr>
<tr>
<td>18</td>
<td>Enable SCA49 (SN49)</td>
<td>Enable</td>
</tr>
<tr>
<td>19</td>
<td>Enable SCA50 (SN50)</td>
<td>Enable</td>
</tr>
<tr>
<td>20</td>
<td>Enable SCA51 (SN51)</td>
<td>Enable</td>
</tr>
<tr>
<td>21</td>
<td>Enable SCA52 (SN52)</td>
<td>Enable</td>
</tr>
<tr>
<td>22</td>
<td>Enable SCA53 (SN53)</td>
<td>Enable</td>
</tr>
<tr>
<td>23</td>
<td>Enable SCA54 (SN54)</td>
<td>Enable</td>
</tr>
<tr>
<td>24</td>
<td>Enable SCA55 (SN55)</td>
<td>Enable</td>
</tr>
<tr>
<td>25</td>
<td>Enable SCA56 (SN56)</td>
<td>Enable</td>
</tr>
<tr>
<td>26</td>
<td>Enable SCA57 (SN57)</td>
<td>Enable</td>
</tr>
<tr>
<td>27</td>
<td>Enable SCA58 (SN58)</td>
<td>Enable</td>
</tr>
<tr>
<td>28</td>
<td>Enable SCA59 (SN59)</td>
<td>Enable</td>
</tr>
<tr>
<td>29</td>
<td>Enable SCA60 (SN60)</td>
<td>Enable</td>
</tr>
</tbody>
</table>

**Description:**
Sets the function specification for the safe motion monitoring.

**Value:**
- 0: Safety with encoder
- 1: Safety without encoder
- 3: Safety without encoder with accel_monitoring/delay time

**Dependency:**
Refer to: C01711
### p9507  SI Motion function configuration (processor 1) / SI Mtn config P1

<table>
<thead>
<tr>
<th>Bit field</th>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td></td>
<td>Extended message acknowledgement</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>01</td>
<td></td>
<td>Setpoint velocity limit for STOP F</td>
<td>No</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>02</td>
<td></td>
<td>Motor type sensorless actual value sensing</td>
<td>Synchronous motor</td>
<td>Induction motor</td>
<td></td>
</tr>
</tbody>
</table>

**Description:**
Sets the function configuration for the safe motion monitoring functions.

**Dependency:**
Refer to: C01711

**Note:**
- Re bit 00:
  
  The function is activated, a safety-relevant acknowledgement (internal event acknowledge) can be performed by selecting/deselecting STO.

- Re bit 01:
  
  When the function is activated, the active setpoint velocity limit (CO: r9733) is set to zero when STOP F is active.

- Re bit 02:
  
  This bit defines the type of motor, which the sensorless safety technology evaluates.

  - For bit = 0, the sensorless motion monitoring function calculates the actual velocity for an induction motor.
  
  - For bit = 1, an actual velocity is calculated for a synchronous motor. This value depends on the setting in p0300.

  Bit = 0 should be set if no motor is defined (p0300 = 0).

### p9509  SI Motion behavior during pulse suppression (processor 1) / SI Mtn behav IL P1

<table>
<thead>
<tr>
<th>Bit field</th>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td></td>
<td>SSM during pulse suppression and sensorless</td>
<td>Becomes inactive</td>
<td>Remains active</td>
<td></td>
</tr>
<tr>
<td>08</td>
<td></td>
<td>SDI during pulse suppression and sensorless</td>
<td>Becomes inactive</td>
<td>Remains active</td>
<td></td>
</tr>
</tbody>
</table>

**Dependency:**
Refer to: C01711

**Note:**
- SDI: Safe Direction (safe motion direction)
- SSM: Safe Speed Monitor (safety-relevant feedback signal from the velocity monitoring)

- For bit = 1 and with the SSM safety function activated, the following applies:
  
  - During pulse suppression, monitoring is switched off and the feedback signal has a 0 signal level.

  - Monitoring continues during pulse suppression. The feedback signal last displayed before pulse suppression is kept and the system goes into the STO state.

- For bit = 0 and with the SSM safety function activated, the following applies:
  
  - Monitoring continues during pulse suppression. The status signal indicates active and the system goes into the STO state.

- For bit = 1 and with the SDI safety function activated, the following applies:
  
  - During pulse suppression, monitoring is switched off and the status signal indicates inactive.

  - Monitoring continues during pulse suppression. The status signal indicates active and the system goes into the STO state.
### p9510

**SI Motion clock-cycle synchronous PROFIBUS master / SI Mtnt sync master**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Dependency</th>
<th>Notice</th>
</tr>
</thead>
<tbody>
<tr>
<td>p9510</td>
<td>Setting for clock cycle synchronous communication between PROFlode controller and Control Unit.</td>
<td>0: Communication not isochronous</td>
<td>Refer to: C01711, A01796</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The parameter is only relevant, if the safety-relevant motion monitoring functions integrated in the drive have been enabled (p9601.2 = 1).</td>
<td>1: Communication isochronous</td>
<td>As of firmware V2.6, the parameter has no effect.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>If a PROFlode controller exchanges process data in clock cycle synchronism with the Control Unit, then p9510 must be set to 1. This also applies if the drive itself does not exchange process data in clock cycle synchronism.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Examples for clock cycle synchronous communication:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- clock-cycle synchronous control for the motion control (e.g. SIMOTION).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- clock-cycle synchronous PROFIsafe master (e.g. SIMATIC S7-400F).</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### p9511

**SI Motion actual value sensing clock cycle (processor 1) / SI Mtnt act clk P1**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p9511</td>
<td>Sets the clock cycle time of the actual value sensing for safe motion monitoring. Setting criteria if the motion monitoring functions are executed with an encoder.</td>
<td>0.2500 [ms] 8.0000 [ms] 2.0000 [ms]</td>
<td>Refer to: F01652</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- A slower clock cycle time reduces the maximum permissible velocity - however, it ensures a lower load of the Control Unit for safe actual value sensing.</td>
<td></td>
<td>The parameter is only active for drive-based motion monitoring functions (p9601.2 = 1).</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- The maximum permissible velocity, which, when exceeded, can mean that errors occur during safe actual value sensing, is displayed in r9730.</td>
<td></td>
<td>The monitoring clock cycle from p9500 must be an integer multiple of this parameter.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Setting criteria if the motion monitoring functions are executed without an encoder:</td>
<td></td>
<td>In the case of motion monitoring functions with encoder, the clock cycle time for actual value sensing must be an integer multiple of the current controller clock cycle and at least 4 times slower than the current controller clock cycle. A factor of at least 8 is recommended. The value for the parameter must also be greater than or equal to 2 ms.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- The actual value sensing clock cycle must be set to the same value as the current controller clock cycle (p0115).</td>
<td></td>
<td>A change only becomes effective after a POWER ON.</td>
<td></td>
</tr>
</tbody>
</table>

### p9515

**SI Motion encoder coarse pos. val. configuration (processor 1) / SI Mtnt s config P1**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Access level: 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>p9515</td>
<td>Sets the encoder configuration for the redundant coarse position value.</td>
<td>0000 0000 0000 0000 0000 0000 0000 bin</td>
<td>1-557</td>
</tr>
</tbody>
</table>

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The encoder that is used for the safe motion monitoring functions on processor 1 must be parameterized in this parameter.

### p9516

**SI Motion encoder configuration safety functions (processor 1) / SI Mtn enc_cfg P1**

- **SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**
- **Can be changed:** C2(95)
- **Data type:** Unsigned16
- **P-Group:** Safety Integrated
- **Not for motor type:** -
- **Min:** -
- **Max:** -

<table>
<thead>
<tr>
<th>Bit field</th>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td></td>
<td>Incrementer</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>01</td>
<td></td>
<td>Encoder CRC least significant byte first</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>02</td>
<td></td>
<td>Redundant coarse position value, most significant bit left-aligned</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>03</td>
<td></td>
<td>DRIVE-CLiQ encoder</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
</tbody>
</table>

### p9517

**SI Motion linear scale grid division (processor 1) / SI Mtn grid P1**

- **SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**
- **Can be changed:** C2(95)
- **Data type:** FloatingPoint32
- **P-Group:** Safety Integrated
- **Not for motor type:** -
- **Min:** 0.00 [nm]
- **Max:** 250000000.00 [nm]

<table>
<thead>
<tr>
<th>Bit field</th>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td></td>
<td>Motor encoder, rotating/linear</td>
<td>Linear</td>
<td>Rotating</td>
<td>-</td>
</tr>
<tr>
<td>01</td>
<td></td>
<td>Position actual value, sign change</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
</tbody>
</table>

### Notes and Dependencies

- **Dependency:** Refer to: r0474, p9315
- **Note:**
  - For safe functions that are not enabled (p9501 = 0), the following applies:
    - p9515 is automatically set the same as p0474 when the system boots.
  - For safety functions that are enabled (p9501 > 0), the following applies:
    - p9515 is checked to see that it matches p0474.

- **Dependency:** Refer to: p0404, p0410
- **Note:**
  - For safe functions that have not been enabled (p9501 = 0), the following applies:
    - p9516.0 is automatically set the same as p0404.0 when the system boots.
  - For safety functions that are enabled (p9501 > 0), the following applies:
    - p9516.1 is checked to identify whether it coincides with p0410.1.

- **Dependency:** Refer to: p9516
- **Note:**
  - For safe functions that have not been enabled (p9501 = 0), the following applies:
    - When booting p9517 is automatically set the same as p0407.
  - For safety functions that are enabled (p9501 > 0), the following applies:
    - p9517 is checked whether it coincides with p0407.
### p9518

**SI motion encoder pulses per revolution (processor 1) / SI Mtn puls/rev P1**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Parameter</strong></td>
<td>Sets the number of encoder pulses per revolution for rotary motor encoders.</td>
<td>Refer to:</td>
<td>For safety functions that have not been enabled (p9501 = 0), the following applies: When booting, p9518 is automatically set the same as p0408. For safety functions that are enabled (p9501 &gt; 0), the following applies: p9518 is checked whether it coincides with p0408.</td>
</tr>
<tr>
<td><strong>Not for motor type:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Min</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Max</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Default</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Factory setting</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:**

Sets the number of encoder pulses per revolution for rotary motor encoders.

**Dependency:**

Refer to: p0408, p9516

**Note:**

For safety functions that have not been enabled (p9501 = 0), the following applies: When booting, p9518 is automatically set the same as p0408.

For safety functions that are enabled (p9501 > 0), the following applies: p9518 is checked whether it coincides with p0408.

### p9519

**SI Motion fine resolution G1_XIST1 (processor 1) / SI Mtn G1_XIST1 P1**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Parameter</strong></td>
<td>Sets the fine resolution for G1_XIST1 in bits.</td>
<td>Refer to:</td>
<td>For safety functions that have not been enabled (p9501 = 0), the following applies: When booting, p9519 is automatically set the same as p0418. For safety functions that are enabled (p9501 &gt; 0), the following applies: p9519 is checked whether it coincides with p0418.</td>
</tr>
<tr>
<td><strong>Not for motor type:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Min</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Max</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Default</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Factory setting</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:**

Sets the fine resolution for G1_XIST1 in bits.

**Dependency:**

Refer to: p0418

**Note:**

For safety functions that have not been enabled (p9501 = 0), the following applies: When booting, p9519 is automatically set the same as p0418.

For safety functions that are enabled (p9501 > 0), the following applies: p9519 is checked whether it coincides with p0418.

### p9520

**SI Motion spindle pitch (processor 1) / SI Mtn Sp_pitch P1**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Notice</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Parameter</strong></td>
<td>Sets the gear ratio between the encoder and load in mm/revolution for a linear axis with rotary encoder. The fourth decimal point can be rounded-off depending on the size of the entered number (from 3 places before the decimal point).</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Not for motor type:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Min</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Max</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Default</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Factory setting</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:**

Sets the gear ratio between the encoder and load in mm/revolution for a linear axis with rotary encoder.

**Notice:**

The fourth decimal point can be rounded-off depending on the size of the entered number (from 3 places before the decimal point).
Parameter

List of parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Index</th>
<th>Dependency</th>
<th>Notice</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p9521[0...7]</td>
<td>SI Motion gearbox enc (motor)/load denominator (processor 1) / SI Mtn gear den P1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td></td>
<td>Can be changed: C2(95)</td>
<td>Calculated: -</td>
<td>Access level: 3</td>
<td></td>
</tr>
<tr>
<td>P-Group: Safety Integrated</td>
<td>Data type: Unsigned32</td>
<td>Dynamic index: -</td>
<td>Func. diagram: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Units group: -</td>
<td>Unit selection: -</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>2147000000</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Description: Sets the denominator for the gearbox between the encoder (or motor in the case of encoderless monitoring functions) and the load.

Index: 0 = Gearbox 1
1 = Gearbox 2
2 = Gearbox 3
3 = Gearbox 4
4 = Gearbox 5
5 = Gearbox 6
6 = Gearbox 7
7 = Gearbox 8

Dependency: Refer to: p9522

Notice: It is not possible to change over the gearbox stages. Gearbox 1 (index 0) is always active.

<table>
<thead>
<tr>
<th>p9522[0...7]</th>
<th>SI Motion gearbox enc (motor)/load numerator (processor 1) / SI Mtn gear num P1</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td></td>
<td>Can be changed: C2(95)</td>
<td>Calculated: -</td>
<td>Access level: 3</td>
<td></td>
</tr>
<tr>
<td>P-Group: Safety Integrated</td>
<td>Data type: Unsigned32</td>
<td>Dynamic index: -</td>
<td>Func. diagram: -</td>
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<td></td>
<td>Units group: -</td>
<td>Unit selection: -</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>2147000000</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Description: Sets the numerator for the gearbox between the encoder (or motor in the case of encoderless monitoring functions) and the load.

Index: 0 = Gearbox 1
1 = Gearbox 2
2 = Gearbox 3
3 = Gearbox 4
4 = Gearbox 5
5 = Gearbox 6
6 = Gearbox 7
7 = Gearbox 8

Dependency: Refer to: p9521

Notice: It is not possible to change over the gearbox stages. Gearbox 1 (index 0) is always active.

Note: In the case of encoderless monitoring functions, the pole pair number must be multiplied by the numerator of the gearbox ratio.

Example: Gearbox ratio 1:4, pole pair number (r0313) = 2
--> p9521 = 1, p9522 = 8 (4 x 2)

<table>
<thead>
<tr>
<th>p9523</th>
<th>SI Motion red. coarse position value valid bits (processor 1) / Valid bits P1</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td></td>
<td>Can be changed: C2(95)</td>
<td>Calculated: -</td>
<td>Access level: 3</td>
</tr>
<tr>
<td>P-Group: Safety Integrated</td>
<td>Data type: Unsigned16</td>
<td>Dynamic index: -</td>
<td>Func. diagram: -</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Units group: -</td>
<td>Unit selection: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>16</td>
<td>9</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Description: Sets the number of valid bits of the redundant coarse position value.

The encoder that is used for the safe motion monitoring functions on processor 1 must be parameterized in this parameter.
### p9524
**SI Motion Redundant coarse pos. value fine resolution bits (P1) / SI Mtn fine bit P1**

<table>
<thead>
<tr>
<th>Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</strong></td>
</tr>
</tbody>
</table>

**Description:**
Sets the number of valid bits for the fine resolution of the redundant coarse position value.

The encoder that is used for the safe motion monitoring functions on processor 1 must be parameterized in this parameter.

**Dependency:**
Refer to: r0471, p9324

**Note:**
For safe functions that are not enabled (p9501 = 0), the following applies:
- p9524 is automatically set the same as r0471 when the system boots.

For safety functions that are enabled (p9501 > 0), the following applies:
- p9524 is checked to see that it matches r0471.

<table>
<thead>
<tr>
<th><strong>Type</strong></th>
<th><strong>Dynamic index</strong></th>
<th><strong>Units group</strong></th>
<th><strong>Unit selection</strong></th>
<th><strong>Access level</strong></th>
<th><strong>Calculated</strong></th>
<th><strong>Func. diagram</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Integer16</td>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Min</strong></th>
<th><strong>Max</strong></th>
<th><strong>Factory setting</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>-16</td>
<td>16</td>
<td>-2</td>
</tr>
</tbody>
</table>

### p9525
**SI Motion Redundant coarse pos. value relevant bits (P1) / Relevant bits P1**

<table>
<thead>
<tr>
<th>Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</strong></td>
</tr>
</tbody>
</table>

**Description:**
Sets the number of relevant bits for the redundant coarse position value.

The encoder that is used for the safe motion monitoring functions on processor 1 must be parameterized in this parameter.

**Dependency:**
Refer to: p0414, r0472, p9325

**Note:**
For safe functions that are not enabled (p9501 = 0), the following applies:
- p9525 is automatically set the same as r0472 when the system boots.

For safety functions that are enabled (p9501 > 0), the following applies:
- p9525 is checked to see that it matches r0472.

<table>
<thead>
<tr>
<th><strong>Type</strong></th>
<th><strong>Dynamic index</strong></th>
<th><strong>Units group</strong></th>
<th><strong>Unit selection</strong></th>
<th><strong>Access level</strong></th>
<th><strong>Calculated</strong></th>
<th><strong>Func. diagram</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Unsigned16</td>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Min</strong></th>
<th><strong>Max</strong></th>
<th><strong>Factory setting</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>16</td>
<td>16</td>
</tr>
</tbody>
</table>

### p9529
**SI Motion Gx_XIST1 coarse pos. safe most significant bit (P1) / Gx_XIST1 MSB P1**

<table>
<thead>
<tr>
<th>Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</strong></td>
</tr>
</tbody>
</table>

**Description:**
Sets the bit number for the safe most significant bit (MSB) of the Gx_XIST1 coarse position.

The encoder that is used for the safe motion monitoring functions on processor 1 must be parameterized in this parameter.

**Dependency:**
Refer to: p0415, r0475, p9329
Note: For safe functions that are not enabled (p9501 = 0), the following applies:
- p9529 is automatically set the same as r0475 when the system boots.
For safety functions that are enabled (p9501 > 0), the following applies:
- p9529 is checked to see that it matches r0475.
MSB: Most Significant Bit

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>p9530</strong> SI Motion standstill tolerance (processor 1) / SI Mtn standst_tol</td>
<td>Sets the tolerance for the function &quot;Safe Operating Stop&quot; (SOS).</td>
<td>Refer to: C01707</td>
<td>SOS: Safe Operating Stop</td>
</tr>
<tr>
<td><strong>p9531[0...3]</strong> SI Motion SLS limit values (processor 1) / SI Mtn SLS lim P1</td>
<td>Sets the limit values for the function &quot;Safely-Limited Speed&quot; (SLS).</td>
<td>Refer to: p9532, p9561, p9563</td>
<td>Refer to: C01714</td>
</tr>
</tbody>
</table>
### List of parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Index</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>p9531[0...3]</strong></td>
<td>SI Motion SLS limit values (processor 1) / SI Mtn SLS lim P1</td>
<td>Can be changed: C2(95)</td>
<td>Calculated: -</td>
<td>Access level: 3</td>
</tr>
<tr>
<td>SERVO_S110-CAN (Safety rot), SERVO_S110-DP (Safety rot), SERVO_S110-PN (Safety rot)</td>
<td>Sets the limit values for the function &quot;Safely-Limited Speed&quot; (SLS).</td>
<td>[0] = Limit value SLS1</td>
<td>Refer to: p9532, p9561, p9563</td>
<td>SLS: Safely-Limited Speed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[1] = Limit value SLS2</td>
<td>Refer to: C01714</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>[2] = Limit value SLS3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>[3] = Limit value SLP4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1000000.00 [rpm]</td>
<td>2000.00 [rpm]</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>p9532[0...15]</strong></td>
<td>SI Motion SLS override factor (processor 1) / SI Mtn SLS over P1</td>
<td>Can be changed: U, T</td>
<td>Calculated: -</td>
<td>Access level: 4</td>
</tr>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Sets the override factor for the limit value for SLS2 and SLS4 for the function &quot;Safely-Limited Speed&quot; (SLS).</td>
<td>[0] = SLS (SG) override factor 0</td>
<td>Refer to: p9501, p9531</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>[1] = SLS (SG) override factor 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>[2] = SLS (SG) override factor 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>[3] = SLS (SG) override factor 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>[4] = SLS (SG) override factor 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>[5] = SLS (SG) override factor 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>[6] = SLS (SG) override factor 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>[7] = SLS (SG) override factor 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>[8] = SLS (SG) override factor 8</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>[9] = SLS (SG) override factor 9</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>[10] = SLS (SG) override factor 10</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>[12] = SLS (SG) override factor 12</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>[13] = SLS (SG) override factor 13</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>[14] = SLS (SG) override factor 14</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>[15] = SLS (SG) override factor 15</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.000 [%]</td>
<td>100.000 [%]</td>
<td>100.000 [%]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>p9533</strong></td>
<td>SI Motion SLS setpoint speed limit (processor 1) / SI Mtn SLS set_lim</td>
<td>Can be changed: U, T</td>
<td>Calculated: -</td>
<td>Access level: 3</td>
</tr>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>This is an evaluation factor to define the setpoint limit from the selected actual speed limit.</td>
<td>Dynamic index: -</td>
<td>Func. diagram: -</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The active SLS limit value is evaluated with this factor and is made available as setpoint limit in r9733.</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.000 [%]</td>
<td>100.000 [%]</td>
<td>80.000 [%]</td>
<td></td>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3
Parameter List of parameters

Dependency: This parameter only has to be parameterized for the motion monitoring functions integrated in the drive (p9601.2 = 1)
  r9733[0] = p9531[x] x p9533 (converted from the load side to the motor side)
  r9733[1] = - p9531[x] x p9533 (converted from the load side to the motor side)
  [x] = Selected SLS stage
  Conversion factor from the motor side to the load side:
  - motor type = rotary and axis type = linear: p9522 / (p9521 x p9520)
  - otherwise: p9522 / p9521
  Refer to: p9501, p9531, p9601

Note: The active actual speed limit is selected via safety-relevant inputs (SGE).
When selecting SOS or a STOP A ... D, setpoint 0 is specified in r9733.
SLS: Safely-Limited Speed

p9534[0...1] SI Motion SLP upper limit values (processor 1) / SI Mtn SLP up lim

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Index</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p9534[0...1] SI Motion SLP upper limit values (processor 1) / SI Mtn SLP up lim</td>
<td>Can be changed: U, T</td>
<td>Calculated: -</td>
<td>Access level: 4</td>
<td></td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td>Dynamic index: -</td>
<td>Func. diagram: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P-Group: Safety Integrated</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-2147000.000 [mm]</td>
<td>2147000.000 [mm]</td>
<td>100000.000 [mm]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

Description: Sets the upper limit for the function "Safely-Limited Position" (SLP).
Index: [0] = Limit value SLP1 (SE1)
[1] = Limit value SLP2 (SE2)
Dependency: Refer to: p9501, p9535, p9562
Note: For the setting of these limit values, the following applies: p9534 > p9535
A change only becomes effective after a POWER ON.
SLP: Safely-Limited Position

p9535[0...1] SI Motion SLP upper limit values (processor 1) / SI Mtn SLP low lim

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Index</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p9535[0...1] SI Motion SLP upper limit values (processor 1) / SI Mtn SLP low lim</td>
<td>Can be changed: U, T</td>
<td>Calculated: -</td>
<td>Access level: 4</td>
<td></td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td>Dynamic index: -</td>
<td>Func. diagram: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P-Group: Safety Integrated</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-2147000.000 [°]</td>
<td>2147000.000 [°]</td>
<td>100000.000 [°]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SERVO_S110-CAN (Safety rot), SERVO_S110-DP (Safety rot), SERVO_S110-PN (Safety rot)

Description: Sets the upper limit for the function "Safely-Limited Position" (SLP).
Index: [0] = Limit value SLP1 (SE1)
[1] = Limit value SLP2 (SE2)
Dependency: Refer to: p9501, p9535, p9562
Note: For the setting of these limit values, the following applies: p9535 > p9535
A change only becomes effective after a POWER ON.
SLP: Safely-Limited Position

p9535[0...1] SI Motion SLP upper limit values (processor 1) / SI Mtn SLP low lim

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Index</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p9535[0...1] SI Motion SLP upper limit values (processor 1) / SI Mtn SLP low lim</td>
<td>Can be changed: U, T</td>
<td>Calculated: -</td>
<td>Access level: 4</td>
<td></td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td>Dynamic index: -</td>
<td>Func. diagram: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P-Group: Safety Integrated</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-2147000.000 [mm]</td>
<td>2147000.000 [mm]</td>
<td>-100000.000 [mm]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

Description: Sets the lower limit for the function "Safely-Limited Position" (SLP).
Index: [0] = Limit value SLP1 (SE1)  
[1] = Limit value SLP2 (SE2)

Dependency:
Refer to: p9501, p9534, p9562

Note:
For the setting of these limit values, the following applies: p9534 > p9535
A change only becomes effective after a POWER ON.

SLP: Safely-Limited Position

### p9535[0...1]

**SI Motion SLP upper limit values (processor 1) / SI Mtn SLP low lim**

<table>
<thead>
<tr>
<th>Parameter Type</th>
<th>Can be changed</th>
<th>Calculated</th>
<th>Access level</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN (Safety rot), SERVO_S110-DP (Safety rot), SERVO_S110-PN (Safety rot)</td>
<td>U, T</td>
<td>-</td>
<td>4</td>
</tr>
</tbody>
</table>

**Data type:** FloatingPoint32  
**P-Group:** Safety Integrated  
**Units group:** -  
**Unit selection:** -  
**Expert list:** 1

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-2147000.000 [°]</td>
<td>2147000.000 [°]</td>
<td>-100000.000 [°]</td>
</tr>
</tbody>
</table>

**Description:**
Sets the lower limit for the function "Safely-Limited Position" (SLP).

**Index:** [0] = Limit value SLP1 (SE1)  
[1] = Limit value SLP2 (SE2)

**Dependency:**
Refer to: p9501, p9534, p9562

**Note:**
For the setting of these limit values, the following applies: p9534 > p9535
A change only becomes effective after a POWER ON.

SLP: Safely-Limited Position

### p9536[0...29]

**SI Motion SCA plus cam position (processor 1) / SI Mtn SCA+**

<table>
<thead>
<tr>
<th>Parameter Type</th>
<th>Can be changed</th>
<th>Calculated</th>
<th>Access level</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>U, T</td>
<td>-</td>
<td>4</td>
</tr>
</tbody>
</table>

**Data type:** FloatingPoint32  
**P-Group:** Safety Integrated  
**Units group:** -  
**Unit selection:** -  
**Expert list:** 1

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-2147000.000 [mm]</td>
<td>2147000.000 [mm]</td>
<td>10.000 [mm]</td>
</tr>
</tbody>
</table>

**Description:**
Sets the plus cam position for the function "Safe Cam" (SCA).

**Index:** [0] = Cam position SCA1 (SN1)  
[1] = Cam position SCA2 (SN2)  
[2] = Cam position SCA3 (SN3)  
[3] = Cam position SCA4 (SN4)  
[5] = Cam position SCA6 (SN6)  
[6] = Cam position SCA7 (SN7)  
[7] = Cam position SCA8 (SN8)  
[8] = Cam position SCA9 (SN9)  
[9] = Cam position SCA10 (SN10)  
[10] = Cam position SCA11 (SN11)  
[12] = Cam position SCA13 (SN13)  
[13] = Cam position SCA14 (SN14)  
[14] = Cam position SCA15 (SN15)  
[15] = Cam position SCA16 (SN16)  
[16] = Cam position SCA17 (SN17)  
[17] = Cam position SCA18 (SN18)  
[18] = Cam position SCA19 (SN19)  
[19] = Cam position SCA20 (SN20)  
[20] = Cam position SCA21 (SN21)  
[21] = Cam position SCA22 (SN22)  
[22] = Cam position SCA23 (SN23)  
[23] = Cam position SCA24 (SN24)  
[25] = Cam position SCA26 (SN26)
### List of parameters

**[26] = Cam position SCA27 (SN27)**

**[27] = Cam position SCA28 (SN28)**

**[28] = Cam position SCA29 (SN29)**

**[29] = Cam position SCA30 (SN30)**

**Dependency:** Refer to: p9501, p9503, p9537

**Note:**
A change only becomes effective after a POWER ON.

SCA: Safe Cam

---

### p9536[0...29] SI Motion SCA plus cam position (processor 1) / SI Mtn SCA+

<table>
<thead>
<tr>
<th>Description</th>
<th>Can be changed:</th>
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<th>Dynamic index:</th>
<th>Units group:</th>
<th>Expert level:</th>
<th>Access level:</th>
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<tbody>
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<td>Sets the plus cam position for the function &quot;Safe Cam&quot; (SCA).</td>
<td>U, T</td>
<td>-</td>
<td>FloatingPoint32</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>4</td>
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</table>

<table>
<thead>
<tr>
<th>Index</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>-2147000.000 [°]</td>
<td>2147000.000 [°]</td>
<td>10.000 [°]</td>
</tr>
</tbody>
</table>

**Dependency:** Refer to: p9501, p9503, p9537

**Note:**
A change only becomes effective after a POWER ON.

SCA: Safe Cam
**Parameter**

**List of parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Index</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p9537[0...29]</td>
<td>SI Motion SCA minus cam position (processor 1) / SI Mtn SCA-</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Sets the minus cam position for the function &quot;Safe Cam&quot; (SCA).</td>
<td></td>
<td>-2147000.000 [°]</td>
<td>2147000.000 [°]</td>
<td>-10.000 [°]</td>
</tr>
<tr>
<td></td>
<td>Can be changed: U, T</td>
<td>Calculated: -</td>
<td>Access level: 4</td>
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<tr>
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<td>Data type: FloatingPoint32</td>
<td>Dynamic index: -</td>
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<td>Func. diagram: -</td>
<td></td>
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<tr>
<td></td>
<td>P-Group: Safety Integrated</td>
<td>Units group: -</td>
<td></td>
<td>Unit selection: -</td>
<td></td>
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<tr>
<td></td>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td></td>
<td>Expert list: 1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Min</td>
<td>Max</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Dependency:**
- Refer to: p9501, p9503, p9536

**Note:**
- A change only becomes effective after a POWER ON.
- SCA: Safe Cam
Parameter

List of parameters

[7] = Cam position SCA8 (SN8)
[8] = Cam position SCA9 (SN9)
[9] = Cam position SCA10 (SN10)
[10] = Cam position SCA11 (SN11)
[12] = Cam position SCA13 (SN13)
[13] = Cam position SCA14 (SN14)
[14] = Cam position SCA15 (SN15)
[15] = Cam position SCA16 (SN16)
[16] = Cam position SCA17 (SN17)
[17] = Cam position SCA18 (SN18)
[18] = Cam position SCA19 (SN19)
[19] = Cam position SCA20 (SN20)
[20] = Cam position SCA21 (SN21)
[21] = Cam position SCA22 (SN22)
[22] = Cam position SCA23 (SN23)
[23] = Cam position SCA24 (SN24)
[25] = Cam position SCA26 (SN26)
[26] = Cam position SCA27 (SN27)
[27] = Cam position SCA28 (SN28)
[28] = Cam position SCA29 (SN29)
[29] = Cam position SCA30 (SN30)

Dependency:
Refer to: p9501, p9503, p9536

Note:
A change only becomes effective after a POWER ON.
SCA: Safe Cam
### List of parameters

#### p9538[0...29]  
**SI Motion SCA cam track assignment (processor 1) / SI Mtn SCA assign.**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>p9538[0...29]</td>
<td>CBA dec</td>
</tr>
<tr>
<td>C</td>
<td>Assignment</td>
</tr>
<tr>
<td>BA</td>
<td>Numerical value for the SGA &quot;cam range&quot;.</td>
</tr>
</tbody>
</table>

**Description:**

Assigns the individual cams to the maximum of 4 cam tracks and defines the numerical value for the SGA "cam range".

- p9538[0...29] = CBA dec
- C = Assignment of the cam to the cam track.
- Valid values are 1, 2, 3, 4.
- BA = Numerical value for the SGA "cam range".
- If the position lies in the range of this cam, the value BA is signaled to the safety-relevant logic via the SGA "cam range" of the cam track set using C.
- Valid values are 0 ... 14. Each numerical value may only be used once for each cam track.

**Examples:**

- p9538[0] = 207
- Cam 1 (index 0) is assigned cam track 2. If the position lies within the range of this cam, a value of 7 is entered in the SGA "cam range" of the second cam track.
- p9538[5] = 100
- Cam 6 (index 5) is assigned cam track 1. If the position lies within the range of this cam, a value of 0 is entered in the SGA "cam range" of the first cam track.
List of parameters

Index:

- [0] = Track assignment SCA1
- [1] = Track assignment SCA2
- [2] = Track assignment SCA3
- [3] = Track assignment SCA4
- [5] = Track assignment SCA6
- [6] = Track assignment SCA7
- [7] = Track assignment SCA8
- [8] = Track assignment SCA9
- [9] = Track assignment SCA10
- [10] = Track assignment SCA11
- [12] = Track assignment SCA13
- [13] = Track assignment SCA14
- [14] = Track assignment SCA15
- [15] = Track assignment SCA16
- [16] = Track assignment SCA17
- [17] = Track assignment SCA18
- [18] = Track assignment SCA19
- [19] = Track assignment SCA20
- [20] = Track assignment SCA21
- [21] = Track assignment SCA22
- [22] = Track assignment SCA23
- [23] = Track assignment SCA24
- [24] = Track assignment SCA25
- [25] = Track assignment SCA26
- [26] = Track assignment SCA27
- [27] = Track assignment SCA28
- [28] = Track assignment SCA29
- [29] = Track assignment SCA30

Dependency:

Refer to: p9501, p9503
Refer to: F01681

Note:

A change only becomes effective after a POWER ON.

SCA: Safe Cam

**p9540**

SI Motion SCA tolerance (processor 1) / SI Mtn SCA tol P1

Can be changed: U, T

| Data type: | FloatingPoint32 |
| Dynamic index: | - |
| Units group: | - |
| Expert list: | 1 |

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0010 [mm]</td>
<td>10.0000 [mm]</td>
<td>0.1000 [mm]</td>
</tr>
</tbody>
</table>

Description:

Sets the tolerance for the function "Safe Cam" (SCA).

Within this tolerance, both monitoring channels may signal different signal states of the same safe cam.

Note:

A change only becomes effective after a POWER ON.

**p9540**

SI Motion SCA tolerance (processor 1) / SI Mtn SCA tol P1

Can be changed: U, T

| Data type: | FloatingPoint32 |
| Dynamic index: | - |
| Units group: | - |
| Expert list: | 1 |

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0010 [°]</td>
<td>10.0000 [°]</td>
<td>0.1000 [°]</td>
</tr>
</tbody>
</table>

Description:

Sets the tolerance for the function "Safe Cam" (SCA).

Within this tolerance, both monitoring channels may signal different signal states of the same safe cam.

Note:

A change only becomes effective after a POWER ON.
### List of parameters

**p9542 SI Motion act. val. comparison tolerance (crossw.) (processor 1) / SI Mtn act tol P1**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
<th>Dependency</th>
</tr>
</thead>
<tbody>
<tr>
<td>p9542</td>
<td></td>
<td>Sets the tolerance for the cross-check of the actual position between the two monitoring channels.</td>
<td>Refer to: C01711</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For encoderless motion monitoring functions, the tolerance must be set to a higher value (12 degrees rotary and 1 mm linear).</td>
<td></td>
</tr>
</tbody>
</table>

**p9542 SI Motion act. val. comparison tolerance (crossw.) (processor 1) / SI Mtn act tol P1**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
<th>Dependency</th>
</tr>
</thead>
<tbody>
<tr>
<td>p9542</td>
<td></td>
<td>Sets the tolerance for the cross-check of the actual position between the two monitoring channels.</td>
<td>Refer to: C01711</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For encoderless motion monitoring functions, the tolerance must be set to a higher value (12 degrees rotary and 1 mm linear).</td>
<td></td>
</tr>
</tbody>
</table>

**p9544 SI Motion actual value comparison tolerance (referencing) (P1) / SI Mtn ref tol P1**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
<th>Dependency</th>
</tr>
</thead>
<tbody>
<tr>
<td>p9544</td>
<td></td>
<td>Sets the tolerance to check the actual values after referencing (incremental encoder) or when powering up (absolute encoder).</td>
<td>Refer to: C01711</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A change only becomes effective after a POWER ON.</td>
<td></td>
</tr>
</tbody>
</table>

**p9544 SI Motion actual value comparison tolerance (referencing) (P1) / SI Mtn ref tol P1**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
<th>Dependency</th>
</tr>
</thead>
<tbody>
<tr>
<td>p9544</td>
<td></td>
<td>Sets the tolerance to check the actual values after referencing (incremental encoder) or when powering up (absolute encoder).</td>
<td>Refer to: C01711</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A change only becomes effective after a POWER ON.</td>
<td></td>
</tr>
</tbody>
</table>
Parameter

List of parameters

---

**p9545**

**SI Motion SSM filter time (processor 1) / SI Mtn SSM filt P1**

- **Can be changed:** C2(95)
- **Calculated:** -
- **Access level:** 3
- **Data type:** FloatingPoint32
- **Dynamic index:** -
- **Func. diagram:** 2860
- **P-Group:** Safety Integrated
- **Units group:** -
- **Unit selection:** -
- **Not for motor type:** -
- **Scaling:** -
- **Expert list:** 1
- **Min:** 0.00 [ms]
- **Max:** 100.00 [ms]
- **Factory setting:** 0.00 [ms]

**Description:**
Sets the filter time for the SSM feedback signal to detect standstill.

**Note:**
- The filter time is effective only if the function is enabled (p9501.16 = 1).
- The parameter is included in the crosswise data comparison of the two monitoring channels.
- SSM: Safe Speed Monitor (safety-relevant feedback signal from the velocity monitoring)

---

**p9546**

**SI Motion SSM velocity limit (processor 1) / SI Mtn SSM v_limP1**

- **Can be changed:** C2(95)
- **Calculated:** -
- **Access level:** 3
- **Data type:** FloatingPoint32
- **Dynamic index:** -
- **Func. diagram:** 2860
- **P-Group:** Safety Integrated
- **Units group:** -
- **Unit selection:** -
- **Not for motor type:** -
- **Scaling:** -
- **Expert list:** 1
- **Min:** 0.00 [mm/min]
- **Max:** 1000000.00 [mm/min]
- **Factory setting:** 20.00 [mm/min]

**Description:**
Sets the velocity limit for the SSM feedback signal to detect standstill (n < nx).

**Caution:**
- The "SAM" function is switched out if the selected threshold value is undershot.

**Note:**
- F-DO: Failsafe Digital Output / SGA: Safety-related output
- SAM: Safe Acceleration Monitor (safe acceleration monitoring)
- SSM: Safe Speed Monitor (safety-relevant feedback signal from the velocity monitoring) / SGA n < nx: Safety-related output n < nx

---

**p9546**

**SI Motion SSM velocity limit (processor 1) / SI Mtn SSM v_limP1**

- **Can be changed:** C2(95)
- **Calculated:** -
- **Access level:** 3
- **Data type:** FloatingPoint32
- **Dynamic index:** -
- **Func. diagram:** 2860
- **P-Group:** Safety Integrated
- **Units group:** -
- **Unit selection:** -
- **Not for motor type:** -
- **Scaling:** -
- **Expert list:** 1
- **Min:** 0.00 [rpm]
- **Max:** 1000000.00 [rpm]
- **Factory setting:** 20.00 [rpm]

**Description:**
Sets the velocity limit for the SSM feedback signal to detect standstill (n < nx).

**Caution:**
- The following applies for p9506 = 3:
  - The "SAM" function is switched out if the selected threshold value is undershot.

**Note:**
- F-DO: Failsafe Digital Output / SGA: Safety-related output
- SAM: Safe Acceleration Monitor (safe acceleration monitoring)
- SSM: Safe Speed Monitor (safety-relevant feedback signal from the velocity monitoring) / SGA n < nx: Safety-related output n < nx
## List of parameters

### p9547 SI Motion SSM velocity hysteresis (processor 1) / SI Mtn SSM hyst P1

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Default Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>p9547</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td></td>
<td>Sets the velocity hysteresis for the SSM feedback signal to detect standstill (n &lt; nx). The parameter is included in the crosswise data comparison of the two monitoring channels. SSM: Safe Speed Monitor (safety-relevant feedback signal from the velocity monitoring)</td>
</tr>
</tbody>
</table>

### p9547 SI Motion SSM velocity hysteresis (processor 1) / SI Mtn SSM hyst P1

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Default Value</th>
<th>Description</th>
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<tr>
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<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td></td>
<td>Sets the velocity hysteresis for the SSM feedback signal to detect standstill (n &lt; nx). The parameter is included in the crosswise data comparison of the two monitoring channels. SSM: Safe Speed Monitor (safety-relevant feedback signal from the velocity monitoring)</td>
</tr>
</tbody>
</table>

### p9548 SI Motion SBR actual velocity tolerance (processor 1) / SI Mtn SBR tol P1

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Default Value</th>
<th>Description</th>
</tr>
</thead>
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<td></td>
</tr>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td></td>
<td>Sets the velocity tolerance for the &quot;SAM&quot; function.</td>
</tr>
</tbody>
</table>

### p9548 SI Motion SBR actual velocity tolerance (processor 1) / SI Mtn SBR tol P1

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Default Value</th>
<th>Description</th>
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<tbody>
<tr>
<td>p9548</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td></td>
<td>Sets the velocity tolerance for the &quot;SAM&quot; function.</td>
</tr>
</tbody>
</table>

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SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3
### Parameter List of parameters

#### p9549 SI Motion slip velocity tolerance (processor 1) / SI Mtn slip P1

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
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<td>C2(95) Can be changed:</td>
<td>C2(95) Can be changed:</td>
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<td>- Dynamic index:</td>
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<td>- Units group:</td>
<td>- Units group:</td>
<td>- Units group:</td>
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<td>- Scaling:</td>
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<td>1 Expert list:</td>
<td>1 Expert list:</td>
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<tr>
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<td>- Not for motor type:</td>
<td>- Not for motor type:</td>
<td>- Not for motor type:</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td>Factory setting</td>
</tr>
<tr>
<td>0.00 [mm/min]</td>
<td>6000.00 [mm/min]</td>
<td>6.00 [mm/min]</td>
<td></td>
</tr>
</tbody>
</table>

**Dependency:**
- Refer to: p9501, p9542

**Note:**
- If the "actual value synchronization" is not enabled (p9501.3 = 0), then the value parameterized in p9542 is used as tolerance in the crosswise data comparison.

#### p9549 SI Motion slip velocity tolerance (processor 1) / SI Mtn slip P1

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Access level</th>
<th>Access level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed:</td>
<td>U, T Can be changed:</td>
<td>U, T Can be changed:</td>
<td>U, T Can be changed:</td>
</tr>
<tr>
<td>Calculated:</td>
<td>- Calculated:</td>
<td>- Calculated:</td>
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</tr>
<tr>
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<td>FloatingPoint32 Data type:</td>
</tr>
<tr>
<td>Dynamic index:</td>
<td>- Dynamic index:</td>
<td>- Dynamic index:</td>
<td>- Dynamic index:</td>
</tr>
<tr>
<td>Units group:</td>
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<td>- Units group:</td>
<td>- Units group:</td>
</tr>
<tr>
<td>Scaling:</td>
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<td>- Scaling:</td>
</tr>
<tr>
<td>Expert list:</td>
<td>1 Expert list:</td>
<td>1 Expert list:</td>
<td>1 Expert list:</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>- Not for motor type:</td>
<td>- Not for motor type:</td>
<td>- Not for motor type:</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td>Factory setting</td>
</tr>
<tr>
<td>0.00 [rpm]</td>
<td>6000.00 [rpm]</td>
<td>6.00 [rpm]</td>
<td></td>
</tr>
</tbody>
</table>

**Dependency:**
- Refer to: p9501, p9542

**Note:**
- If the "actual value synchronization" is not enabled (p9501.3 = 0), then the value parameterized in p9542 is used as tolerance in the crosswise data comparison.

#### p9550 SI Motion SGE changeover tolerance time (processor 1) / SI Mtn SGE_chg tol

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Access level</th>
<th>Access level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed:</td>
<td>U, T Can be changed:</td>
<td>U, T Can be changed:</td>
<td>U, T Can be changed:</td>
</tr>
<tr>
<td>Calculated:</td>
<td>- Calculated:</td>
<td>- Calculated:</td>
<td>- Calculated:</td>
</tr>
<tr>
<td>Data type:</td>
<td>FloatingPoint32 Data type:</td>
<td>FloatingPoint32 Data type:</td>
<td>FloatingPoint32 Data type:</td>
</tr>
<tr>
<td>Dynamic index:</td>
<td>- Dynamic index:</td>
<td>- Dynamic index:</td>
<td>- Dynamic index:</td>
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<tr>
<td>Units group:</td>
<td>- Units group:</td>
<td>- Units group:</td>
<td>- Units group:</td>
</tr>
<tr>
<td>Scaling:</td>
<td>- Scaling:</td>
<td>- Scaling:</td>
<td>- Scaling:</td>
</tr>
<tr>
<td>Expert list:</td>
<td>1 Expert list:</td>
<td>1 Expert list:</td>
<td>1 Expert list:</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>- Not for motor type:</td>
<td>- Not for motor type:</td>
<td>- Not for motor type:</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td>Factory setting</td>
</tr>
<tr>
<td>0.00 [ms]</td>
<td>10000.00 [ms]</td>
<td>500.00 [ms]</td>
<td></td>
</tr>
</tbody>
</table>

**Dependency:**
- Refer to: p9501, p9542

**Note:**
- If the "actual value synchronization" is not enabled (p9501.3 = 0), then the value parameterized in p9542 is used as tolerance in the crosswise data comparison.
### Parameter List

**p9552**  
**SI Motion transition time STOP C to SOS (processor 1) / SI Mtn t C->SOS P1**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</strong></td>
<td>Sets the transition time from STOP C to &quot;Safe Operating Stop&quot; (SOS).</td>
<td><strong>SOS: Safe Operating Stop</strong></td>
</tr>
<tr>
<td>Can be changed: C2(95)</td>
<td></td>
<td><strong>Access level: 3</strong></td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td>Calculated: -</td>
<td><strong>Func. diagram: 2825</strong></td>
</tr>
<tr>
<td>P-Group: Safety Integrated</td>
<td>Dynamic index: -</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Units group: -</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Scaling: -</td>
<td><strong>Expert list: 1</strong></td>
</tr>
<tr>
<td>0.00 [ms]</td>
<td>600000.00 [ms]</td>
<td><strong>Factory setting</strong></td>
</tr>
<tr>
<td>Max</td>
<td>100.00 [ms]</td>
<td></td>
</tr>
</tbody>
</table>

**p9553**  
**SI Motion transition time STOP D to SOS (processor 1) / SI Mtn t D->SOS P1**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</strong></td>
<td>Sets the transition time from STOP D to &quot;Safe Operating Stop&quot; (SOS).</td>
<td><strong>SOS: Safe Operating Stop</strong></td>
</tr>
<tr>
<td>Can be changed: C2(95)</td>
<td></td>
<td><strong>Access level: 3</strong></td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td>Calculated: -</td>
<td><strong>Func. diagram: 2825</strong></td>
</tr>
<tr>
<td>P-Group: Safety Integrated</td>
<td>Dynamic index: -</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Units group: -</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Scaling: -</td>
<td><strong>Expert list: 1</strong></td>
</tr>
<tr>
<td>0.00 [ms]</td>
<td>600000.00 [ms]</td>
<td><strong>Factory setting</strong></td>
</tr>
<tr>
<td>Max</td>
<td>100.00 [ms]</td>
<td></td>
</tr>
</tbody>
</table>

**p9554**  
**SI Motion transition time STOP E to SOS (processor 1) / SI Mtn t E->SOS P1**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</strong></td>
<td>Sets the transition time from STOP E to &quot;Safe Operating Stop&quot; (SOS).</td>
<td><strong>SOS: Safe Operating Stop</strong></td>
</tr>
<tr>
<td>Can be changed: C2(95)</td>
<td></td>
<td><strong>Access level: 3</strong></td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td>Calculated: -</td>
<td><strong>Func. diagram: 2825</strong></td>
</tr>
<tr>
<td>P-Group: Safety Integrated</td>
<td>Dynamic index: -</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Units group: -</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Scaling: -</td>
<td><strong>Expert list: 1</strong></td>
</tr>
<tr>
<td>0.00 [ms]</td>
<td>600000.00 [ms]</td>
<td><strong>Factory setting</strong></td>
</tr>
<tr>
<td>Max</td>
<td>100.00 [ms]</td>
<td></td>
</tr>
</tbody>
</table>

**p9555**  
**SI Motion transition time STOP F to STOP B (processor 1) / SI Mtn t F->B P1**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</strong></td>
<td>Sets the transition time from STOP F to STOP B.</td>
<td><strong>Dependency: Refer to: p9354</strong></td>
</tr>
<tr>
<td>Can be changed: C2(95)</td>
<td></td>
<td><strong>Access level: 3</strong></td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td>Calculated: -</td>
<td><strong>Func. diagram: 2825</strong></td>
</tr>
<tr>
<td>P-Group: Safety Integrated</td>
<td>Dynamic index: -</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Units group: -</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Scaling: -</td>
<td><strong>Expert list: 1</strong></td>
</tr>
<tr>
<td>0.00 [ms]</td>
<td>600000.00 [ms]</td>
<td><strong>Factory setting</strong></td>
</tr>
<tr>
<td>Max</td>
<td>0.00 [ms]</td>
<td></td>
</tr>
</tbody>
</table>

**p9556**  
**SI Motion pulse suppression delay time (processor 1) / SI Mtn IL t_del P1**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</strong></td>
<td>Sets the delay time for the safe pulse suppression after STOP B.</td>
<td><strong>Dependency: Refer to: C01711</strong></td>
</tr>
<tr>
<td>Can be changed: C2(95)</td>
<td></td>
<td><strong>Access level: 3</strong></td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td>Calculated: -</td>
<td><strong>Func. diagram: 2825</strong></td>
</tr>
<tr>
<td>P-Group: Safety Integrated</td>
<td>Dynamic index: -</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Units group: -</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Scaling: -</td>
<td><strong>Expert list: 1</strong></td>
</tr>
<tr>
<td>0.00 [ms]</td>
<td>600000.00 [ms]</td>
<td><strong>Factory setting</strong></td>
</tr>
<tr>
<td>Max</td>
<td>100.00 [ms]</td>
<td></td>
</tr>
</tbody>
</table>

In the case of encoderless motion monitoring functions with brake ramp monitoring (p9506 = 1), the parameter has no effect.
### Parameter List of parameters

**Dependency:**
- Refer to: p9560
- Refer to: C01701

**p9557 SI Motion pulse suppression test time (processor 1) / SI Mtn IL t_test**

<table>
<thead>
<tr>
<th>Data type</th>
<th>Dynamic index</th>
<th>Units group</th>
<th>Unit selection</th>
<th>Expert list</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>FloatingPoint32</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>100.00 [ms]</td>
</tr>
<tr>
<td>P-Group</td>
<td>Safety Integrated</td>
<td>Units group</td>
<td>-</td>
<td>1</td>
<td>0.00 [ms]</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Units group</td>
<td>-</td>
<td>1</td>
<td>10000.00 [ms]</td>
</tr>
<tr>
<td>Max</td>
<td>Factory setting</td>
<td>Units group</td>
<td>-</td>
<td>1</td>
<td>8.00 [h]</td>
</tr>
</tbody>
</table>

**Description:**
Sets the time after which the pulses must have been suppressed when initiating the test stop.

**Dependency:**
- Refer to: C01798

**Note:**
A change only becomes effective after a POWER ON.

**p9558 SI Motion acceptance test mode time limit (processor 1) / SI Mtn acc t P1**

<table>
<thead>
<tr>
<th>Data type</th>
<th>Dynamic index</th>
<th>Units group</th>
<th>Unit selection</th>
<th>Expert list</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>FloatingPoint32</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>40000.00 [ms]</td>
</tr>
<tr>
<td>P-Group</td>
<td>Safety Integrated</td>
<td>Units group</td>
<td>-</td>
<td>1</td>
<td>40000.00 [ms]</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Units group</td>
<td>-</td>
<td>1</td>
<td>8.00 [h]</td>
</tr>
</tbody>
</table>

**Description:**
Sets the maximum time for the acceptance test mode.
If the acceptance test mode takes longer than the selected time limit, then the mode is automatically terminated.

**Dependency:**
- Refer to: C01799

**p9559 SI Motion forced checking procedure timer (processor 1) / SI Mtn dyn timer**

<table>
<thead>
<tr>
<th>Data type</th>
<th>Dynamic index</th>
<th>Units group</th>
<th>Unit selection</th>
<th>Expert list</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>FloatingPoint32</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>8.00 [h]</td>
</tr>
<tr>
<td>P-Group</td>
<td>Safety Integrated</td>
<td>Units group</td>
<td>-</td>
<td>1</td>
<td>8.00 [h]</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Units group</td>
<td>-</td>
<td>1</td>
<td>9000.00 [h]</td>
</tr>
</tbody>
</table>

**Description:**
Sets the time interval for carrying out the forced checking procedure and testing the safety motion monitoring functions integrated in the drives.
Within the parameterized time, the safety functions must have been tested at least once (including de-selection of the "STO" function).
This monitoring time is reset each time the test is carried out.
The signal source to initiate the forced checking procedure is set in p9705.

**Dependency:**
- Refer to: p9705
- Refer to: A01697, C01798

**Note:**
STO: Safe Torque Off

**p9560 SI Motion pulse suppression shutdown velocity (processor 1) / SI Mtn IL v_sh P1**

<table>
<thead>
<tr>
<th>Data type</th>
<th>Dynamic index</th>
<th>Units group</th>
<th>Unit selection</th>
<th>Expert list</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>FloatingPoint32</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>0.00 [mm/min]</td>
</tr>
<tr>
<td>P-Group</td>
<td>Safety Integrated</td>
<td>Units group</td>
<td>-</td>
<td>1</td>
<td>0.00 [mm/min]</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Units group</td>
<td>-</td>
<td>1</td>
<td>6000.00 [mm/min]</td>
</tr>
</tbody>
</table>

**Description:**
Sets the shutdown velocity for pulse suppression.
Below this velocity "standstill" is assumed and for STOP B / SS1, the pulses are suppressed (by changing to STOP A).
In the case of encoderless motion monitoring functions, the parameter must be > 0 (recommended value: 10).
**Dependency:** Refer to: p9556

### p9560

**SI Motion pulse suppression shutdown speed (Control Unit) / SI Mtn IL n_shutCU**

- **SERVO_S110-CAN (Safety rot), SERVO_S110-DP (Safety rot), SERVO_S110-PN (Safety rot)**
- **Can be changed:** C2(95)
- **Data type:** FloatingPoint32
- **P-Group:** Safety Integrated
- **Not for motor type:** -

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.00</td>
<td>6000.00</td>
<td>0.00 [rpm]</td>
</tr>
</tbody>
</table>

**Description:**
Sets the shutdown speed for the pulse suppression. Below this speed "standstill" is assumed and for STOP B, the pulses are suppressed by changing to STOP A).

**Dependency:** Refer to: p9556

### p9561

**SI Motion SLS stop response (processor 1) / SI Mtn SLS resp**

- **SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**
- **Can be changed:** U, T
- **Data type:** Integer16
- **P-Group:** Safety Integrated
- **Not for motor type:** -

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>14</td>
<td>5</td>
</tr>
</tbody>
</table>

**Description:**
Sets the stop response for the function "Safely-Limited Speed" (SLS). This setting applies for all SLS limit values.
An input value of less than 5 signifies personnel protection, from 10 and upwards, machine protection.
This parameter can only be used for ncSI nutzbar, not for dbSI1/2. For motion monitoring functions integrated in the drive (dbSI1/2) only the value 5 is permissible; all other settings result in fault F01711 or F30711 with fault value 44.

**Value:**
- 0: STOP A
- 1: STOP B
- 2: STOP C
- 3: STOP D
- 4: STOP E
- 5: Sets the stop response via p9563 (SLS-specific)
- 10: STOP A with delayed pulse suppression when the bus fails
- 11: STOP B with delayed pulse suppression when the bus fails
- 12: STOP C with delayed pulse suppression when the bus fails
- 13: STOP D with delayed pulse suppression when the bus fails
- 14: STOP E with delayed pulse suppression when the bus fails

**Dependency:** Refer to: p9531, p9563, p9580

**Note:**
SLS: Safely-Limited Speed

### p9562

**SI Motion SLP stop response (processor 1) / SI Mtn SLP resp**

- **SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**
- **Can be changed:** U, T
- **Data type:** Integer16
- **P-Group:** Safety Integrated
- **Not for motor type:** -

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>4</td>
<td>2</td>
</tr>
</tbody>
</table>

**Description:**
Sets the stop response for the function "Safely-Limited Position" (SLP).

**Value:**
- 2: STOP C
- 3: STOP D
- 4: STOP E

**Dependency:** Refer to: p9534, p9535

**Note:**
SLP: Safely-Limited Position
p9563[0...3]  SI Motion SLS-specific stop response (processor 1) / SI Mtn SLS stop P1

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Index</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Sets the SLS-specific stop response for the function &quot;Safety-Limited Speed&quot; (SLS).</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data type: Integer16</td>
<td>In the case of encoderless motion monitoring (p9506/p9306 = 1), only a value of 0 or 1 is permitted.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P-Group: Safety Integrated</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factory setting</td>
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<td></td>
</tr>
<tr>
<td>0</td>
<td>STOP A</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>STOP B</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>STOP C</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>STOP D</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>STOP E</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>STOP A with delayed pulse suppression when the bus fails</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>STOP B with delayed pulse suppression when the bus fails</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>STOP C with delayed pulse suppression when the bus fails</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>STOP D with delayed pulse suppression when the bus fails</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>STOP E with delayed pulse suppression when the bus fails</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Index: 

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>[0]</td>
<td>Limit value SLS1</td>
</tr>
<tr>
<td>[1]</td>
<td>Limit value SLS2</td>
</tr>
<tr>
<td>[2]</td>
<td>Limit value SLS3</td>
</tr>
<tr>
<td>[3]</td>
<td>Limit value SLP4</td>
</tr>
</tbody>
</table>

Dependency: Refer to: p9531, p9561, p9580

Note: The values 4 and 14 are not supported on Control Unit 305.

SLS: Safety-Limited Speed

p9564  SI Motion SDI tolerance (processor 1) / SI Mtn SDI tol P1

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Index</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Sets the tolerance for the function &quot;Safe motion direction&quot; (SDI). This motion in the monitored direction is still permissible before an alarm is initiated.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P-Group: Safety Integrated</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factory setting</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.001 [mm]</td>
<td>360.000 [mm]</td>
<td>12.000 [mm]</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Dependency: Refer to: p9565, p9566

Note: Refer to: C01716

SDI: Safe Direction (safe motion direction)

p9564  SI Motion SDI tolerance (processor 1) / SI Mtn SDI tol P1

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Index</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN (Safety rot), SERVO_S110-DP (Safety rot), SERVO_S110-PN (Safety rot)</td>
<td>Sets the tolerance for the function &quot;Safe motion direction&quot; (SDI). This motion in the monitored direction is still permissible before an alarm is initiated.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P-Group: Safety Integrated</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factory setting</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.001 [']</td>
<td>360.000 [']</td>
<td>12.000 [']</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Dependency: Refer to: p9565, p9566

Note: Refer to: C01716

SDI: Safe Direction (safe motion direction)
### List of parameters

#### p9565 SI Motion SDI delay time (processor 1) / SI Mtn SDI t P1

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p9565 SI Motion SDI delay time (processor 1) / SI Mtn SDI t P1</td>
<td>Sets the delay time for the function &quot;Safe motion direction&quot; (SDI). When selecting the SDI function, motion in the monitored direction is permissible as a maximum for this time; this means that this time can be used for braking existing motion.</td>
<td></td>
<td></td>
<td>SDI: Safe Direction (safe motion direction)</td>
</tr>
</tbody>
</table>

#### p9566 SI Motion SDI stop response (processor 1) / SI Mtn SDI Stop P1

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p9566 SI Motion SDI stop response (processor 1) / SI Mtn SDI Stop P1</td>
<td>Sets the stop response for the function &quot;Safe motion direction&quot; (SDI). This setting applies to both directions of motion.</td>
<td></td>
<td></td>
<td>SDI: Safe Direction (safe motion direction)</td>
</tr>
</tbody>
</table>

#### p9568 SI Motion SAM velocity limit (processor 1) / SI Mtn SAM v_limP1

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p9568 SI Motion SAM velocity limit (processor 1) / SI Mtn SAM v_limP1</td>
<td>Sets the velocity tolerance limit for the &quot;SAM&quot; function. SAM is de-activated once the set velocity limit has been undershot.</td>
<td></td>
<td></td>
<td>SAM: Safe Acceleration Monitor (safe acceleration monitoring) SSM: Safe Speed Monitor (safety-relevant feedback signal from the velocity monitoring) For p9568 = p9368 = 0, the following applies: The value in p9546/p9346 (SSM) is applied as the velocity limit for SAM.</td>
</tr>
</tbody>
</table>
### p9568
**SI Motion SAM velocity limit (processor 1) / SI Mtn SAM v_limp1**

- **Description:** Sets the velocity tolerance limit for the "SAM" function. SAM is de-activated once the set velocity limit has been undershot.

- **Note:**
  - SAM: Safe Acceleration Monitor (safe acceleration monitoring)
  - SSM: Safe Speed Monitor (safety-relevant feedback signal from the velocity monitoring)
  - For p9568 = p9368 = 0, the following applies: The value in p9546/p9346 (SSM) is applied as the velocity limit for SAM.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.00 [rpm]</td>
<td>Min</td>
</tr>
<tr>
<td>1000.00 [rpm]</td>
<td>Max</td>
<td></td>
</tr>
</tbody>
</table>

### p9570
**SI Motion acceptance test mode (processor 1) / SI Mtn Acc_mode**

- **Description:** Setting to select and de-select the acceptance test mode.

- **Value:**
  - 0: [00 hex] De-select the acceptance test mode
  - 172: [AC hex] Select the acceptance test mode

- **Dependency:**
  - Refer to: p9558, r9571, p9601
  - Refer to: C01799

- **Note:** Acceptance test mode can only be selected if the motion monitoring functions, which are integrated in the drives, are enabled (p9601.2/p9801.2).

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0000 hex</td>
<td>Min</td>
</tr>
<tr>
<td>100AC hex</td>
<td>Max</td>
<td></td>
</tr>
</tbody>
</table>

### r9571
**SI Motion acceptance test status (processor 1) / SI Mtn acc_status**

- **Description:** Displays the status of the acceptance test mode.

- **Value:**
  - 0: [00 hex] Acc_mode inactive
  - 12: [OC hex] Acc_mode not possible due to POWER ON fault
  - 13: [OD hex] Acc_mode not possible due to incorrect ID in p9570
  - 15: [0F hex] Acc_mode not possible due to expired Acc_timer
  - 172: [AC hex] Acc_mode active

- **Dependency:**
  - Refer to: p9558, p9570
  - Refer to: C01799
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>p9580</strong></td>
<td>SI Motion pulse suppression delay bus failure (processor 1) / SI Mtn t to IL P1</td>
<td>Sets the delay time after which the pulses are safely suppressed after a bus failure.</td>
</tr>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Can be changed: C2(95)</td>
<td>Refer to: p9561, p9563</td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td>Calculated: -</td>
<td></td>
</tr>
<tr>
<td>P-Group: Safety Integrated</td>
<td>Dynamic index: -</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Units group: -</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td></td>
</tr>
<tr>
<td>0.00 [ms]</td>
<td>800.00 [ms]</td>
<td>Factory setting 0.00 [ms]</td>
</tr>
</tbody>
</table>

| **p9581** | SI Motion brake ramp reference value (processor 1) / SI Mtn ramp ref P1 | Sets the reference value to define the brake ramp. The rate of rise of the brake ramp depends upon p9581 (reference value) and p9583 (monitoring time). |
| SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN | Can be changed: C2(95) | Refer to: p9582, p9583 |
| Data type: FloatingPoint32 | Calculated: - | |
| P-Group: Safety Integrated | Dynamic index: - | |
| Not for motor type: - | Units group: - | |
| Min | Max | Factory setting |
| 600.0000 [mm/min] | 24000.0000 [mm/min] | 1500.0000 [mm/min] |

| **p9582** | SI Motion brake ramp delay time (processor 1) / SI Mtn rp t_del P1 | Sets the delay time for monitoring the brake ramp. Monitoring of the brake ramp starts once the delay time has elapsed. |
| SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN | Can be changed: C2(95) | Refer to: p9581, p9583 |
| Data type: FloatingPoint32 | Calculated: - | |
| P-Group: Safety Integrated | Dynamic index: - | |
| Not for motor type: - | Units group: - | |
| Min | Max | Factory setting |
| 10.00 [ms] | 99000.00 [ms] | 250.00 [ms] |
Parameter

List of parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Notice</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p9583</td>
<td>Sets the monitoring time to define the brake ramp.</td>
<td>Refer to: p9581, p9582</td>
<td>Reducing this value can adversely affect the actual value sensing and the plausibility check. When the value is increased, this results in a longer evaluation delay. This parameter is only effective for encoderless actual value sensing (p9306/p9506 = 1).</td>
<td>Sets the monitoring time to define the brake ramp. The rate of rise of the brake ramp depends upon p9581 (reference value) and p9583 (monitoring time).</td>
</tr>
<tr>
<td>p9586</td>
<td>Sets the evaluation delay for encoderless actual value sensing after pulse enable. The value should be greater than or equal to the motor magnetizing time. Shortening the time can result in Alarm 1711 with fault value 1041 or 1042.</td>
<td>Refer to: C01711</td>
<td>Reducing this value can adversely affect the actual value sensing and the plausibility check. When the value is increased, this results in a longer evaluation delay.</td>
<td>This parameter is only effective for encoderless actual value sensing (p9306/p9506 = 1).</td>
</tr>
<tr>
<td>p9587</td>
<td>Sets the filter time for smoothing the actual value with sensorless actual value sensing.</td>
<td></td>
<td>This parameter is only effective for encoderless actual value sensing (p9306/p9506 = 1).</td>
<td></td>
</tr>
<tr>
<td>p9588</td>
<td>Sets the minimum current for encoderless actual value sensing in reference to 10 mA (i.e. when 1 % = 10 mA). - The value must be increased if C01711 has occurred with message value 1042. - The value must be decreased if C01711 has occurred with message value 1041.</td>
<td>Refer to: C01711</td>
<td>Reducing this percentage value can adversely affect actual value sensing.</td>
<td>This parameter is only effective for encoderless actual value sensing (p9306/p9506 = 1).</td>
</tr>
</tbody>
</table>
**p9589**  
SI Motion voltage tolerance acceleration (processor 1) / SI Mtn U tol P1  

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Access level</th>
<th>Data type</th>
<th>Dynamic index</th>
<th>Dynamic index</th>
<th>Units group</th>
<th>Unit selection</th>
<th>Expert list</th>
<th>Access level</th>
<th>Function diagram</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>p9589</td>
<td>Sets the voltage tolerance for suppressing acceleration peaks. Increasing this percentage value means that voltage peaks will need to have a higher amplitude during acceleration procedures if they are not to affect actual value sensing. - The value must be increased if C01711 has occurred with message value 1043. - The value must be lowered if acceleration procedures have led to an excessive Safety actual velocity.</td>
<td>3</td>
<td>FloatingPoint32</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>3</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>MIN</td>
<td>10.00 [%]</td>
<td>100.00 [%]</td>
<td>Factory setting</td>
<td>100.00 [%]</td>
<td>100.00 [%]</td>
<td>100.00 [%]</td>
<td>Factory setting</td>
<td>1</td>
<td>3</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

**Dependancy:** Refer to: C01711

**Note:** This parameter is only effective for encoderless actual value sensing (p9306/p9506 = 1).

---

**r9590[0...3]**  
SI Motion version safety motion monitoring (processor 1) / SI Mtn version P1  

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Access level</th>
<th>Data type</th>
<th>Dynamic index</th>
<th>Dynamic index</th>
<th>Units group</th>
<th>Unit selection</th>
<th>Expert list</th>
<th>Access level</th>
<th>Function diagram</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>r9590[0]</td>
<td>Displays the Safety Integrated version for the safe monitoring functions. [0] = Safety Version (major release) [1] = Safety Version (minor release) [2] = Safety Version (baselevel or patch) [3] = Safety Version (hotfix)</td>
<td>3</td>
<td>Unsigned16</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>MIN</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

**Dependancy:** Refer to: r9770, r9890

**Note:** Example: r9590[0] = 2, r9590[1] = 60, r9590[2] = 1, r9590[3] = 0 --> SI Motion version V02.60.01.00

---

**p9601**  
SI enable, functions integrated in the drive (processor 1) / SI enable fct P1  

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Access level</th>
<th>Data type</th>
<th>Dynamic index</th>
<th>Dynamic index</th>
<th>Units group</th>
<th>Unit selection</th>
<th>Expert list</th>
<th>Access level</th>
<th>Function diagram</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>p9601</td>
<td>Sets the enable signals for safety functions on processor 1 that are integrated in the drive.</td>
<td>3</td>
<td>Unsigned32</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>3</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>MIN</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0000 bin</td>
<td>3</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

**Dependancy:** Refer to: r9771, p9801

**Note:** STO: Safe Torque Off
A change only becomes effective after a POWER ON.
### p9601

**Parameter:** SI enable, functions integrated in the drive (processor 1) / SI enable fct P1

**Description:** Sets the enable signals for safety functions on processor 1 that are integrated in the drive.

**Dependency:** Refer to: r9771, p9801

**Note:**
- STO: Safe Torque Off
- A change only becomes effective after a POWER ON.

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>STO (SH) via terminals (Control Unit) enable</td>
<td>Enable</td>
<td>Inhibit</td>
<td>2810</td>
</tr>
<tr>
<td>02</td>
<td>Motion monitoring functions integr. in the drive (Control Unit)</td>
<td>Enable</td>
<td>Inhibit</td>
<td>-</td>
</tr>
<tr>
<td>03</td>
<td>PROFIsafe (Control Unit) enable</td>
<td>Enable</td>
<td>Inhibit</td>
<td>-</td>
</tr>
</tbody>
</table>

### p9602

**Parameter:** SI enable Safe Brake Control (processor 1) / SI enable SBC P1

**Description:** Sets the enable signal for the "Safe Brake Control" (SBC) function on processor 1.

**Dependency:** Refer to: p9802

**Note:**
- The "Safe Brake Control" function is not activated until at least one safety monitoring function has been enabled (i.e. p9501 not equal to 0 and/or p9601 not equal to 0).
- It does not make sense to parameterize "no motor holding brake available" and enable "Safe Brake Control" (p1215 = 0, p9602 = p9802 = 1) if there is no motor holding brake.
- It does not make sense to parameterize "motor holding brake the same as sequence control, connection via BICO" and enable "Safe Brake Control" (p1215 = 3, p9602 = p9802 = 1).
- It is not permissible to parameterize "motor holding brake without feedback signals" and enable "Safe Brake Control" (p1278 = 1, p9602 = p9802 = 1).
- SBC: Safe Brake Control

### p9610

**Parameter:** SI PROFIsafe address (processor 1) / SI PROFIsafe P1

**Description:** Sets the PROFIsafe address for processor 1.

**Dependency:** Refer to: p9810
### p9650 SI F-DI changeover tolerance time (processor 1) / SI F-DI_chg tol P1

**Description:**
Sets the tolerance time for the changeover of the safety-related inputs on processor 1.
An F-DI changeover is not effective simultaneously due to the different runtimes in the two monitoring channels.
After an F-DI changeover, dynamic data is not subject to a crosswise data comparison during this tolerance time.

**Dependency:**
Refer to: p9850

**Note:**
For a crosswise data comparison between p9650 and p9850, a difference of one Safety monitoring clock cycle is tolerated.
The parameterized time is internally rounded-off to an integer multiple of the monitoring clock cycle.

**F-DI:** Failsafe Digital Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Type</th>
<th>Group</th>
<th>Units</th>
<th>Access level</th>
</tr>
</thead>
<tbody>
<tr>
<td>p9650 SI F-DI changeover tolerance time (processor 1) / SI F-DI_chg tol P1</td>
<td>0.00 [ms] - 2000.00 [ms]</td>
<td>FloatingPoint32</td>
<td>Safety Integrated</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

### p9651 SI STO/SBC/SS1 debounce time (processor 1) / SI STO t_debou P1

**Description:**
Sets the debounce time for the digital input used to control STO/SBC/SS1.
The debounce time is rounded down to whole milliseconds. It specifies the maximum duration of a fault pulse at the failsafe digital inputs with no reaction/influence on the selection or deselection of the Safety Basic Functions.

**Example:**
Debounce time = 1 ms: Fault pulses of 1 ms are filtered; only pulses longer than 2 ms are processed.
Debounce time = 3 ms: Fault pulses of 3 ms are filtered; only pulses longer than 4 ms are processed.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Type</th>
<th>Group</th>
<th>Units</th>
<th>Access level</th>
</tr>
</thead>
<tbody>
<tr>
<td>p9651 SI STO/SBC/SS1 debounce time (processor 1) / SI STO t_debou P1</td>
<td>0.00 [ms] - 100.00 [ms]</td>
<td>FloatingPoint32</td>
<td>Safety Integrated</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

### p9652 SI Safe Stop 1 delay time (processor 1) / SI Stop 1 t_del P1

**Description:**
Sets the delay time of the pulse suppression for the *Safe Stop 1* (SS1) function on processor 1 to brake along the OFF3 down ramp (p1135).

**Recommend.:**
In order that the drive can completely ramp-down along the OFF3 ramp and a motor holding brake that is possibly available can close, then the delay time should be set as follows:

- Motor holding brake parameterized: delay time >= p1135 + p1228 + p1217
- Motor holding brake not parameterized: delay time >= p1135 + p1228

**Dependency:**
Refer to: p1135, p9852

**Note:**
For a crosswise data comparison between p9652 and p9852, a difference of one Safety monitoring clock cycle is tolerated.
The parameterized time is rounded internally to an integer multiple of the monitoring clock cycle.

SS1: Safe Stop 1 (corresponds to Stop Category 1 acc. to EN60204)
**p9658**

**SI transition time STOP F to STOP A (processor 1) / SI STOP F->A P1**

Can be changed: C2(95)  
Data type: FloatingPoint32  
P-Group: Safety Integrated  
Not for motor type: -  
Min: 0.00 [ms]  
Max: 30000.00 [ms]  
Factory setting: 0.00 [ms]

**Description:**
Sets the transition period from STOP F to STOP A on processor 1.

**Dependency:**
Refer to: r9795, p9858

**Note:**
- For a crosswise data comparison between p9658 and p9858, a difference of one Safety monitoring clock cycle is tolerated.
- The parameterized time is rounded internally to an integer multiple of the monitoring clock cycle.

**p9659**

**SI forced checking procedure timer / SI FrcdCkProcTimer**

Can be changed: C2(95)  
Data type: FloatingPoint32  
P-Group: Safety Integrated  
Not for motor type: -  
Min: 0.00 [h]  
Max: 9000.00 [h]  
Factory setting: 8.00 [h]

**Description:**
Sets the time interval for carrying out the forced checking procedure and testing the Safety shutdown paths. Within the parameterized time, STO must have been de-selected at least once. The monitoring time is reset each time that STO is de-selected.

**Dependency:**
Refer to: A01699

**Note:**
STO: Safe Torque Off / SH: Safe standstill

**r9660**

**SI forced checking procedure remaining time / SI frc chk remain**

Can be changed: -  
Data type: FloatingPoint32  
P-Group: Safety Integrated  
Not for motor type: -  
Min: - [h]  
Factory setting: - [h]

**Description:**
Displays the time remaining before dynamization and testing of the safety shutdown paths (forced checking procedure).

**Dependency:**
Refer to: A01699

**p9700**

**SI Motion copy function / SI Mtn copy fct**

Can be changed: C2(95), U, T  
Data type: Integer16  
P-Group: Safety Integrated  
Not for motor type: -  
Min: 0000 hex  
Max: 00D0 hex  
Factory setting: 0000 hex

**Description:**
Setting to start the required copy function. After starting, the corresponding parameters are copied from processor 1 to processor 2. Once copying is complete, the parameter is automatically reset to zero.

**Value:**
- 0: [00 hex] Copy function ended
- 29: [1D hex] Start copy function node identifier
### Acknowledge SI motion data change / Ackn SI Mtn dat

#### p9701

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
<th>Can be changed: C2(95), U, T</th>
<th>Calculated: -</th>
<th>Access level: 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type: Integer16</td>
<td>Dynamic index: -</td>
<td>Func. diagram: -</td>
<td></td>
</tr>
<tr>
<td>P-Group: Safety Integrated</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
</tr>
</tbody>
</table>

**Value:**

0: [00 hex] Data unchanged
172: [AC hex] Acknowledge data change complete
220: [DC hex] Acknowledge SI basic parameter change
236: [EC hex] Acknowledge hardware CRC

**Dependency:**
Refer to: r9398, p9399, r9728, p9729, r9798, p9799, r9898, p9899

**Note:**
Re value = AC and DC hex:
These values can only be set if the safety commissioning mode is set and the Safety Integrated password was entered.

**Description:**
Sets to transfer the reference checksums from the associated actual checksums after changes (SI parameters, hardware).

After transferring the reference checksums, parameters are automatically reset to zero.

### BI: SI Motion: Test stop signal source / SI Mtn test stop

#### p9705

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
<th>Can be changed: C2(95)</th>
<th>Calculated: -</th>
<th>Access level: 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type: Unsigned32 / Binary</td>
<td>Dynamic index: -</td>
<td>Func. diagram: -</td>
<td></td>
</tr>
<tr>
<td>P-Group: Safety Integrated</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
</tr>
</tbody>
</table>

**Dependency:**
Refer to: p9705

**Note:**
Re value = AC and DC hex:
These values can only be set if the safety commissioning mode is set and the Safety Integrated password was entered.

**Caution:**
Before setting the signal source in p9705 it must be ensured that the signal source is at a logical 0.

**Notice:**
It is not permissible to use TM54F inputs to start the test stop.

### SI Motion diagnostics result list 1 / SI Mtn res_list 1

#### r9710[0...1]

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
<th>Can be changed: -</th>
<th>Calculated: -</th>
<th>Access level: 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type: Unsigned32</td>
<td>Dynamic index: -</td>
<td>Func. diagram: -</td>
<td></td>
</tr>
<tr>
<td>P-Group: Safety Integrated</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
</tr>
</tbody>
</table>

**Description:**
Displays result list 1 that, for the crosswise data comparison between the monitoring channels, led to the fault.

**Index:**
[0] = Result list, second channel
[1] = Result list, drive

<table>
<thead>
<tr>
<th>Bit field</th>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Actual value &gt; upper limit SOS</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>01</td>
<td>Actual value &gt; lower limit SOS</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>02</td>
<td>Actual value &gt; upper limit, SLP1</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>
### Parameter

#### List of parameters

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>0 signal</th>
<th>1 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Actual value &gt; upper limit SCA1+</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>01</td>
<td>Actual value &gt; lower limit, SCA1+</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>02</td>
<td>Actual value &gt; upper limit SCA1-</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>03</td>
<td>Actual value &gt; lower limit, SCA1-</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>04</td>
<td>Actual value &gt; upper limit SCA2+</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>05</td>
<td>Actual value &gt; lower limit, SCA2+</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>06</td>
<td>Actual value &gt; upper limit SCA2-</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>07</td>
<td>Actual value &gt; lower limit, SCA2-</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>08</td>
<td>Actual value &gt; upper limit SCA3+</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>09</td>
<td>Actual value &gt; lower limit, SCA3+</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>10</td>
<td>Actual value &gt; upper limit SCA3-</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
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<tr>
<td>11</td>
<td>Actual value &gt; lower limit, SCA3-</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>12</td>
<td>Actual value &gt; upper limit SCA4+</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>13</td>
<td>Actual value &gt; lower limit, SCA4+</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
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<tr>
<td>14</td>
<td>Actual value &gt; upper limit SCA4-</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>15</td>
<td>Actual value &gt; lower limit, SCA4-</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
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<tr>
<td>16</td>
<td>Actual value &gt; upper limit, SSM+</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>17</td>
<td>Actual value &gt; lower limit, SSM+</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>18</td>
<td>Actual value &gt; upper limit, SSM-</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>19</td>
<td>Actual value &gt; lower limit, SSM-</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>20</td>
<td>Actual value &gt; upper limit, modulo</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>21</td>
<td>Actual value &gt; lower limit, modulo</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
</tbody>
</table>

**Dependency:**
Refer to: C01711

**Note:**
SAC: Safe Cam
SSM: Safe Speed Monitor (safety-relevant feedback signal from the velocity monitoring)
### r9712  SI Motion diagnostics position actual value motor side / SI Mtn s_act mot

<table>
<thead>
<tr>
<th>Can be changed</th>
<th>Calculated</th>
<th>Access level</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>3</td>
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</tbody>
</table>

**Data type:** Unsigned32  
**Dynamic index:** -  
**Func. diagram:** -  
**P-Group:** Safety Integrated  
**Units group:** -  
**Unit selection:** -  
**Not for motor type:** -  
**Scaling:** -  
**Expert list:** 1  
**Min**  
**Max**  
**Factory setting**  

**Description:** Displays the actual motor-side position actual value for the motion monitoring functions on the Control Unit.

**Dependency:** Refer to: r9724

**Note:**
- For linear axes, the following unit applies: millimeters per minute
- For rotary axes, the following unit applies: revolutions per minute

### r9713[0...3]  SI Motion diagnostics position actual value load side / SI Mtn s_act load

<table>
<thead>
<tr>
<th>Can be changed</th>
<th>Calculated</th>
<th>Access level</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>3</td>
</tr>
</tbody>
</table>

**Data type:** Unsigned32  
**Dynamic index:** -  
**Func. diagram:** -  
**P-Group:** Safety Integrated  
**Units group:** -  
**Unit selection:** -  
**Not for motor type:** -  
**Scaling:** -  
**Expert list:** 1  
**Min**  
**Max**  
**Factory setting**  

**Description:** Displays the actual load-side actual values of both monitoring channels and their difference.

**Index:**
- [0] = Load-side actual value on the Control Unit
- [1] = Load-side actual value on the second channel
- [2] = Load-side actual value difference Control Unit - second channel
- [3] = Load-side max. actual value difference CU - 2nd channel

**Dependency:** Refer to: r9724

**Note:**
- Re index 0: The display of the load-side position actual value on the Control Unit is updated in the monitoring clock cycle.
- Re index 1: The display of the load-side position actual value on the second channel is updated in the CDC clock cycle (r9724) and delayed by one CDC clock cycle.
- Re index 2: The difference between the load-side position actual value on the Control Unit and load-side position actual value in the second channel is updated in the CDC clock cycle (r9724) and delayed by one CDC clock cycle.
- Re index 3: The maximum difference between the load-side position actual value on the Control Unit and the load-side position actual value on the second channel.

**CDC:** Crosswise Data Check

### r9714[0...1]  SI motion diagnostics velocity / SI Mtn diag v

<table>
<thead>
<tr>
<th>Can be changed</th>
<th>Calculated</th>
<th>Access level</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>3</td>
</tr>
</tbody>
</table>

**Data type:** FloatingPoint32  
**Dynamic index:** -  
**Func. diagram:** -  
**P-Group:** Safety Integrated  
**Units group:** -  
**Unit selection:** -  
**Not for motor type:** -  
**Scaling:** -  
**Expert list:** 1  
**Min**  
**Max**  
**Factory setting**  

**Description:** Displays the current velocity actual values for the motion monitoring functions on the Control Unit.

**Index:**
- [0] = Load-side velocity actual value on the Control Unit
- [1] = Actual SAM/SBR velocity limit on the Control Unit

**Note:**
- For linear axes, the following unit applies: millimeters per minute
- For rotary axes, the following unit applies: revolutions per minute
**Parameter**

**List of parameters**

---

**r9714[0...1]**

**SI motion diagnostics velocity / SI Mtn diag v**

<table>
<thead>
<tr>
<th>SERVO_S110-CAN (Safety rot), SERVO_S110-DP (Safety rot), SERVO_S110-PN (Safety rot)</th>
<th>Can be changed: -</th>
<th>Calculated: -</th>
<th>Access level: 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data type: FloatingPoint32</td>
<td>Dynamic index: -</td>
<td>Func. diagram: -</td>
<td></td>
</tr>
<tr>
<td>P-Group: Safety Integrated</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
</tr>
</tbody>
</table>

**Min** | **Max** | **Factory setting**
--- | --- | ---
- [rpm] | - [rpm] | -

**Description:** Displays the current velocity actual values for the motion monitoring functions on the Control Unit.

**Index:**
- [0] = Load-side velocity actual value on the Control Unit
- [1] = Actual SAM/SBR velocity limit on the Control Unit

**Note:**
- For linear axes, the following unit applies: millimeters per minute
- For rotary axes, the following unit applies: revolutions per minute

---

**r9718.23**

**CO/BO: SI Motion control signals 1 / SI Mtn ctrl_sig 1**

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
<th>Can be changed: -</th>
<th>Calculated: -</th>
<th>Access level: 4</th>
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</thead>
<tbody>
<tr>
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<td>Func. diagram: -</td>
<td></td>
</tr>
<tr>
<td>P-Group: Safety Integrated</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
</tr>
</tbody>
</table>

**Min** | **Max** | **Factory setting**
--- | --- | ---
- | - | -

**Description:** Control signal 1 for safety-relevant motion monitoring functions.

**Bit field:**

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>23</td>
<td>Set offset for TfS to the actual torque</td>
<td>Set</td>
<td>Reset</td>
<td>-</td>
</tr>
</tbody>
</table>

**Note:** TfS: Traverse to fixed stop

---

**r9719.0...31**

**CO/BO: SI Motion control signals 2 / SI Mtn ctrl_sig 2**

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
<th>Can be changed: -</th>
<th>Calculated: -</th>
<th>Access level: 3</th>
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</thead>
<tbody>
<tr>
<td>Data type: Unsigned32</td>
<td>Dynamic index: -</td>
<td>Func. diagram: -</td>
<td></td>
</tr>
<tr>
<td>P-Group: Safety Integrated</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
</tr>
</tbody>
</table>

**Min** | **Max** | **Factory setting**
--- | --- | ---
- | - | -

**Description:** Control signal 2 for safety-relevant motion monitoring functions.

**Bit field:**

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>De-select SOS/SLS (SBH/SG)</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>01</td>
<td>De-select SOS (SBH)</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>03</td>
<td>Select SLS (SG) bit 0</td>
<td>Set</td>
<td>Not set</td>
<td>-</td>
</tr>
<tr>
<td>04</td>
<td>Select SLS (SG) bit 1</td>
<td>Set</td>
<td>Not set</td>
<td>-</td>
</tr>
<tr>
<td>05</td>
<td>Deselect SDI positive</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>06</td>
<td>Deselect SDI negative</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>08</td>
<td>Gearbox selection, bit 0</td>
<td>Set</td>
<td>Not set</td>
<td>-</td>
</tr>
<tr>
<td>09</td>
<td>Gearbox selection, bit 1</td>
<td>Set</td>
<td>Not set</td>
<td>-</td>
</tr>
<tr>
<td>10</td>
<td>Gearbox selection, bit 2</td>
<td>Set</td>
<td>Not set</td>
<td>-</td>
</tr>
<tr>
<td>12</td>
<td>Select SLP (SE)</td>
<td>SLP2 (SE2)</td>
<td>SLP1 (SE1)</td>
<td>-</td>
</tr>
<tr>
<td>13</td>
<td>Close brake from control</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>15</td>
<td>Select test stop</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>16</td>
<td>SGE valid</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>18</td>
<td>De-select external STOP A</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>19</td>
<td>De-select external STOP C</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>20</td>
<td>De-select external STOP D</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>21</td>
<td>De-select external STOP E</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>28</td>
<td>SLS (SG) override bit 0</td>
<td>Set</td>
<td>Not set</td>
<td>-</td>
</tr>
<tr>
<td>29</td>
<td>SLS (SG) override bit 1</td>
<td>Set</td>
<td>Not set</td>
<td>-</td>
</tr>
</tbody>
</table>
### List of parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>SLS (SG) override bit 2 Set Not set -</td>
</tr>
<tr>
<td>31</td>
<td>SLS (SG) override bit 3 Set Not set -</td>
</tr>
</tbody>
</table>

**Note:**

Re r9719.0 and r9719.1:

These two bits must be considered together.

- If SOS/SLS (SBH/SG) is de-selected using bit 0, then assignment of bit 1 is irrelevant.
- If SOS/SLS (SBH/SG) is selected using bit 0, then a changeover is made between SOS (SBH) and SLS (SG) using bit 1.

SLP: Safely-Limited Position / SE: Safe software limit switches
SLS: Safely-Limited Speed / SG: Safely reduced speed
SOS: Safe Operating Stop / SBH: Safe operating stop
SDI: Safe Direction (safe motion direction)

#### r9720.0...13

**CO/BO: SI Motion control signals integrated in the drive / SI Mtn integ STW**

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
</tr>
</thead>
</table>

**Can be changed:** -  | **Calculated:** -  | **Access level:** 3  
**Data type:** Unsigned32  | **Dynamic index:** -  | **Func. diagram:** 2840, 2855  
**P-Group:** Safety Integrated  | **Units group:** -  | **Unit selection:** -  
**Not for motor type:** -  | **Scaling:** -  | **Expert list:** 1  

**Min**  | **Max**  | **Factory setting**  
-  | -  | -  

**Description:** Control signals for safety-relevant motion monitoring functions integrated in the drive.

<table>
<thead>
<tr>
<th>Bit field</th>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>De-select STO</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>01</td>
<td>De-select SS1</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>02</td>
<td>De-select SS2</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>03</td>
<td>De-select SOS</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>04</td>
<td>De-select SLS</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>07</td>
<td>Acknowledgement</td>
<td>Signal edge active</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>09</td>
<td>Select SLS bit 0</td>
<td>Set</td>
<td>Not set</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Select SLS bit 1</td>
<td>Set</td>
<td>Not set</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Deselect SDI positive</td>
<td>Yes</td>
<td>No</td>
<td>2861</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Deselect SDI negative</td>
<td>Yes</td>
<td>No</td>
<td>2861</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** This parameter is only supplied with actual values in the case of Safety Integrated Extended Functions. For Safety Integrated Basic Functions (SBC, SS1, STO), the value is equal to zero.

#### r9721.0...15

**CO/BO: SI Motion status signals / SI Mtn stat_sig**

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
</tr>
</thead>
</table>

**Can be changed:** -  | **Calculated:** -  | **Access level:** 3  
**Data type:** Unsigned32  | **Dynamic index:** -  | **Func. diagram:** -  
**P-Group:** Safety Integrated  | **Units group:** -  | **Unit selection:** -  
**Not for motor type:** -  | **Scaling:** -  | **Expert list:** 1  

**Min**  | **Max**  | **Factory setting**  
-  | -  | -  

**Description:** Status signal for safety-relevant motion monitoring functions.

<table>
<thead>
<tr>
<th>Bit field</th>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>SOS or SLS active</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>01</td>
<td>SOS active</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>02</td>
<td>Pulse enable</td>
<td>Deleted</td>
<td>Enabled</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>03</td>
<td>Active SLS stage bit 0</td>
<td>Set</td>
<td>Not set</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>04</td>
<td>Active SLS stage bit 1</td>
<td>Set</td>
<td>Not set</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>05</td>
<td>Velocity below limit value n_x</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>06</td>
<td>Status signals valid</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>07</td>
<td>Safely referenced</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>08</td>
<td>SDI pos active</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>09</td>
<td>SDI neg active</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>STOP A or B active</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>STOP C active</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>STOP D active</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>STOP E active</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>
Note: This parameter is only supplied with actual values in the case of Safety Integrated Extended Functions. For Safety Integrated Basic Functions (SBC, SS1, STO), the value is equal to zero.

**r9722.0...15** CO/BO: SI Motion status signals integrated in the drive / SI Mtn integ stat

**SERVO_S110-CAN,**
**SERVO_S110-DP,**
**SERVO_S110-PN**

Can be changed: -  Calculated: -  Access level: 3  
Data type: Unsigned32  Dynamic index: -  Func. diagram: 2840, 2855  
P-Group: Safety Integrated  Units group: -  Unit selection: -  
Not for motor type: -  Scaling: -  Expert list: 1  
Min Max  Factory setting - - -

**Description:** Status signal for safety-relevant motion monitoring functions integrated in the drive.

**Bit field:**

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>STO active</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>01</td>
<td>SS1 active</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>02</td>
<td>SS2 active</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>03</td>
<td>SOS active</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>04</td>
<td>SLS active</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>07</td>
<td>Internal event</td>
<td>No</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>09</td>
<td>Active SLS stage bit 0</td>
<td>Set</td>
<td>Not set</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Active SLS stage bit 1</td>
<td>Set</td>
<td>Not set</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>SOS selected</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>SDI pos active</td>
<td>Yes</td>
<td>No</td>
<td>2861</td>
</tr>
<tr>
<td>13</td>
<td>SDI neg active</td>
<td>Yes</td>
<td>No</td>
<td>2861</td>
</tr>
<tr>
<td>15</td>
<td>SSM (speed below limit value)</td>
<td>Yes</td>
<td>No</td>
<td>2860</td>
</tr>
</tbody>
</table>

**Notice:**  
Re bit 07:  
The signal state behaves in an opposite way to the PROFIsafe Standard.

**Note:**  
This parameter is only supplied with actual values in the case of Safety Integrated Extended Functions. For Safety Integrated Basic Functions (SBC, SS1, STO), the value is equal to zero.

Re bit 07:  
An internal event is displayed if a STOP A ... F is active.

**r9723.0...16** CO/BO: SI Motion diagnostic signals integrated in the drive / SI Mtn integ diag

**SERVO_S110-CAN,**
**SERVO_S110-DP,**
**SERVO_S110-PN**

Can be changed: -  Calculated: -  Access level: 3  
Data type: Unsigned32  Dynamic index: -  Func. diagram: -  
P-Group: Safety Integrated  Units group: -  Unit selection: -  
Not for motor type: -  Scaling: -  Expert list: 1  
Min Max  Factory setting - - -

**Description:** Displays the diagnostic signals for safety-relevant motion monitoring functions integrated in the drive.

**Bit field:**

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Forced checking procedure required</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>01</td>
<td>For ESR, STOP F and subsequent stop B is active</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>02</td>
<td>Communication failure</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>03</td>
<td>Actual value sensing supplies valid value</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>04</td>
<td>Encoderless act val sensing acc to technique for U/f control</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>16</td>
<td>SAM/SBR active</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
</tbody>
</table>

**Note:**  
ESR: Extended Stop and Retract  
SAM: Safe Acceleration Monitor (safe acceleration monitoring)  
SBR: Safe Brake Ramp (safe brake ramp monitoring)
### r9724
**SI Motion crosswise comparison clock cycle / SI Mtn CDC clk cyc**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Data type</th>
<th>Access level</th>
</tr>
</thead>
<tbody>
<tr>
<td>r9724</td>
<td>Displays the crosswise comparison clock cycle.</td>
<td>FloatingPoint32</td>
<td>3</td>
</tr>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>The value indicates the clock cycle time with which each individual CDC value is compared between the two monitoring channels.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Refer to: p9500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>- [ms]</td>
<td>- [ms]</td>
<td></td>
</tr>
<tr>
<td>Max</td>
<td>Factory setting</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### r9725[0...2]
**SI Motion, diagnostics STOP F / SI Mtn Diag STOP F**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Data type</th>
<th>Access level</th>
</tr>
</thead>
<tbody>
<tr>
<td>r9725</td>
<td>Displays the message value that resulted in the STOP F on the drive.</td>
<td>Unsigned32</td>
<td>3</td>
</tr>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Value = 0: The Control Unit signaled a STOP F.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Value = 1 ... 999: Number of the incorrect date in the crosswise data comparison between the monitoring channels.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Value &gt;= 1000: Additional diagnostic values of the drive.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max</td>
<td>Re index 1: Displays the value of the Control Unit that resulted in the STOP F.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-</td>
<td>Re index 2: Displays the value from the second channel that resulted in the STOP F.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### p9726
**SI Motion, user agreement selection/de-selection / SI Mtn UserAgr sel**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Data type</th>
<th>Access level</th>
</tr>
</thead>
<tbody>
<tr>
<td>p9726</td>
<td>Setting to select and de-select the user agreement.</td>
<td>Integer16</td>
<td>4</td>
</tr>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Value: 0: [00 hex] De-select user agreement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>172: [AC hex] Select user agreement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Factory setting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max</td>
<td>0000 hex</td>
<td>00AC hex</td>
<td></td>
</tr>
</tbody>
</table>
### r9727: SI Motion user agreement, inside the drive / SI Mtn UserAgr int

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
<th>Index</th>
<th>Dependency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Servo</td>
<td>Can be changed: -</td>
<td>Displays the internal state of the user agreement.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data type</td>
<td>Dynamic index: -</td>
<td>Value = 0: User agreement is not set.</td>
<td></td>
<td>p9726</td>
</tr>
<tr>
<td>P-Group</td>
<td>Safety Integrated</td>
<td>Value = AC hex: User agreement is set.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Max</td>
<td>Factories setting</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### r9728[0...2]: SI Motion actual checksum, SI parameters / SI Mtn act CRC

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
<th>Index</th>
<th>Dependency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Servo</td>
<td>Can be changed: -</td>
<td>Displays the checksum over the checked Safety Integrated parameters of the motion monitoring functions (actual checksum).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data type</td>
<td>Dynamic index: -</td>
<td>[0] = Checksum over SI parameters for motion monitoring</td>
<td></td>
<td>F01680</td>
</tr>
<tr>
<td>P-Group</td>
<td>Safety Integrated</td>
<td>[1] = Checksum over SI parameters for actual values</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type</td>
<td>-</td>
<td>[2] = Checksum over SI parameters for hardware</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Max</td>
<td>Factories setting</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### p9729[0...2]: SI Motion reference checksum, SI parameters / SI Mtn ref CRC

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
<th>Index</th>
<th>Dependency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Servo</td>
<td>Can be changed: C2(95)</td>
<td>Sets the checksum using the checksum-tested Safety Integrated parameters for motion monitoring functions (reference checksum).</td>
<td></td>
<td>r9728</td>
</tr>
<tr>
<td>Data type</td>
<td>Dynamic index: -</td>
<td>[0] = Checksum over SI parameters for motion monitoring</td>
<td></td>
<td>F01680</td>
</tr>
<tr>
<td>P-Group</td>
<td>Safety Integrated</td>
<td>[1] = Checksum over SI parameters for actual values</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type</td>
<td>-</td>
<td>[2] = Checksum over SI parameters for hardware</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Max</td>
<td>Factories setting</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### r9730: SI Motion Safe maximum velocity / SI mtn safe v_Max

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
<th>Index</th>
<th>Dependency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Servo</td>
<td>Can be changed: -</td>
<td>Displays the safe maximum velocity (on the load side) that is permissible for the safe motion monitoring functions as a result of the actual value sensing.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data type</td>
<td>Dynamic index: -</td>
<td>This parameter is only of significance for enabled safety with encoder. Otherwise, it is set to &quot;0&quot;.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P-Group</td>
<td>Safety Integrated</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td></td>
<td>- [mm/min]</td>
<td></td>
</tr>
<tr>
<td>Max</td>
<td>Factories setting</td>
<td></td>
<td>[mm/min]</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
<th>Index</th>
<th>Dependency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Servo</td>
<td>Can be changed: -</td>
<td></td>
<td></td>
<td>r9728</td>
</tr>
<tr>
<td>Data type</td>
<td>Dynamic index: -</td>
<td></td>
<td></td>
<td>F01680</td>
</tr>
<tr>
<td>P-Group</td>
<td>Safety Integrated</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td></td>
<td>- [mm/min]</td>
<td></td>
</tr>
<tr>
<td>Max</td>
<td>Factories setting</td>
<td></td>
<td>[mm/min]</td>
<td></td>
</tr>
</tbody>
</table>

### Note:
If the value displayed is exceeded, message C01711 is output indicating relevant subsequent faults.
### List of parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>r9730</td>
<td>Displays the safe maximum velocity (on the load side) that is permissible for the safe motion monitoring functions as a result of the actual value sensing.</td>
<td>Displays the safe maximum velocity (on the load side) that is permissible for the safe motion monitoring functions as a result of the actual value sensing. This parameter is only of significance for enabled safety with encoder. Otherwise, it is set to &quot;0&quot;.</td>
</tr>
<tr>
<td>r9731</td>
<td>Displays the safe position accuracy (on the load side) that can be achieved as a maximum for the safe motion monitoring functions as a result of the actual value sensing. This parameter is only of significance for enabled safety with encoder. Otherwise, it is set to &quot;0&quot;.</td>
<td>Displays the safe position accuracy (on the load side) that can be achieved as a maximum for the safe motion monitoring functions as a result of the actual value sensing. This parameter is only of significance for enabled safety with encoder. Otherwise, it is set to &quot;0&quot;.</td>
</tr>
<tr>
<td>r9732</td>
<td>Displays the safe velocity resolution (load side). Setpoints for velocity limits or parameter changes for velocities below this threshold have no effect.</td>
<td>Displays the safe velocity resolution (load side). Setpoints for velocity limits or parameter changes for velocities below this threshold have no effect. This parameter does not provide any information about the actual accuracy of the velocity sensing. This depends on the type of actual value sensing, the gear factors as well as the quality of the encoder being used.</td>
</tr>
</tbody>
</table>
### r9732
**SI Motion velocity resolution / SI Mtn v_res**

**SERVO_S110-CAN** (Safety rot), **SERVO_S110-DP** (Safety rot), **SERVO_S110-PN** (Safety rot)

**Description:**
Displays the safe velocity resolution (load side).

Setpoints for velocity limits or parameter changes for velocities below this threshold have no effect.

**Note:**
This parameter does not provide any information about the actual accuracy of the velocity sensing. This depends on the type of actual value sensing, the gear factors as well as the quality of the encoder being used.

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>- [rpm]</td>
<td>- [rpm]</td>
<td>- [rpm]</td>
</tr>
</tbody>
</table>

### r9733[0...2]
**CO: SI Motion setpoint speed limit effective / SI Mtn setp_lim**

**SERVO_S110-CAN**, **SERVO_S110-DP**, **SERVO_S110-PN**

**Description:**
Displays the necessary setpoint speed limit as a result of the selected motion monitoring functions.

Contrary to the parameterization of the SI limit values, this parameter specifies the motor-side limit value and not the load-side limit value.

<table>
<thead>
<tr>
<th>Index</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>[0]</td>
<td>Setpoint limiting positive</td>
</tr>
<tr>
<td>[1]</td>
<td>Setpoint limiting negative</td>
</tr>
<tr>
<td>[2]</td>
<td>Setpoint limit absolute</td>
</tr>
</tbody>
</table>

**Dependency:**
For SLS: $r9733[0] = p9531[x] \times p9533$ (converted from the load side to the motor side)
For SDI negative: $r9733[0] = 0$
For SLS: $r9733[1] = -p9531[x] \times p9533$ (converted from the load side to the motor side)
For SDI positive: $r9733[1] = 0$

$[x] =$ Selected SLS stage

**Notice:**
If $p1051 = r9733[0]$ is interconnected, $p1052 = r9733[1]$ must also be interconnected.
If only the absolute value of the setpoint velocity limiting is required, $r9733[2]$ must be interconnected.

**Note:**
The unit changeover between linear and rotary axis is not implemented via the safety changeover ($p9502$) but by the linear motor changeover.

If the "SLS" or "SDI" function is not selected, $r9733[0]$ shows $p1082$ and $r9733[1]$ shows $-p1082$.
The display in $r9733$ can be delayed by up to one Safety monitoring clock cycle as compared to the display in $r9719/r9720$ and $r9721/r9722$.

### r9734.0...15
**CO/BO: SI Motion Safety Info Channel status word / SI Mtn info ch ZSW**

**SERVO_S110-CAN**, **SERVO_S110-DP**, **SERVO_S110-PN**

**Description:**
Displays the status word for the Safety information channel.
### List of parameters

#### Bit field:

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>STO active</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>01</td>
<td>SS1 active</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>02</td>
<td>SS2 active</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>03</td>
<td>SOS active</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>04</td>
<td>SLS active</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>05</td>
<td>SOS selected</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>06</td>
<td>SLS selected</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>07</td>
<td>Internal event</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>12</td>
<td>SDI positive selected</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>13</td>
<td>SDI neg selected</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>14</td>
<td>ESR retract requested</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>15</td>
<td>Safety message present</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
</tbody>
</table>

#### Note:
- This parameter is only supplied with actual values in the case of Safety Integrated Extended Functions. For Safety Integrated Basic Functions (SBC, SS1, STO), the value is equal to zero.
- Re bit 07:
  - An internal event is displayed if a STOP A ... F is active.

### r9742.0...15 CO/BO: SI Motion drive-integrated status signals (processor 2) / SI Mtn int st P2

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

- **Can be changed:** -
- **Calculated:** -
- **Access level:** 4
- **Data type:** Unsigned32
- **Dynamic index:** -
- **Func. diagram:** -
- **P-Group:** Safety Integrated
- **Units group:** -
- **Unit selection:** -
- **Not for motor type:** -
- **Min**
- **Max**
- **Factory setting**

**Description:**
- Status signal for safety-relevant motion monitoring functions integrated in the drive.

**Bit field:**

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>STO active</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>01</td>
<td>SS1 active</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>02</td>
<td>SS2 active</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>03</td>
<td>SOS active</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>04</td>
<td>SLS active</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>07</td>
<td>Internal event</td>
<td>No</td>
<td>Yes</td>
<td>-</td>
</tr>
<tr>
<td>09</td>
<td>Active SLS stage bit 0</td>
<td>Set</td>
<td>Not set</td>
<td>-</td>
</tr>
<tr>
<td>10</td>
<td>Active SLS stage bit 1</td>
<td>Set</td>
<td>Not set</td>
<td>-</td>
</tr>
<tr>
<td>11</td>
<td>SOS selected</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>12</td>
<td>SDI pos active</td>
<td>Yes</td>
<td>No</td>
<td>2861</td>
</tr>
<tr>
<td>13</td>
<td>SDI neg active</td>
<td>Yes</td>
<td>No</td>
<td>2861</td>
</tr>
<tr>
<td>15</td>
<td>SSM (speed below limit value)</td>
<td>Yes</td>
<td>No</td>
<td>2860</td>
</tr>
</tbody>
</table>

**Notice:**
- Re bit 07:
  - An internal event is displayed if a STOP A ... F is active.
- The signal state behaves in an opposite way to the PROFIsafe Standard.

### r9744 SI message buffer changes, counter / SI msg_buffer chng

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

- **Can be changed:** -
- **Calculated:** -
- **Access level:** 3
- **Data type:** Unsigned16
- **Dynamic index:** -
- **Func. diagram:** -
- **P-Group:** Messages
- **Units group:** -
- **Unit selection:** -
- **Not for motor type:** -
- **Min**
- **Max**
- **Factory setting**

**Description:**
- Displays the changes of the safety message buffer. This counter is incremented every time that the safety message buffer changes.

**Recommend:**
- This is used to check whether the safety message buffer has been read out consistently.

**Dependency:**
- Refer to: r9747, r9748, r9749, p9752, r9753, r9754, r9755, r9756
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>r9745[0...63] SI component number / SI comp_num</td>
<td>Displays the component number of the safety message that has occurred.</td>
<td></td>
<td>Displays the component number of the safety message that has occurred.</td>
</tr>
<tr>
<td>r9747[0...63] SI message code / SI msg_code</td>
<td>Displays the numbers of safety messages that have occurred.</td>
<td>Refer to: r9744, r9748, r9749, p9752, r9753, r9754, r9755, r9756</td>
<td>Value = 0: Assignment to a component not possible.</td>
</tr>
<tr>
<td>r9748[0...63] SI message time received in milliseconds / SI t_msg_recv ms</td>
<td>Displays the relative system runtime in milliseconds when the safety message occurred.</td>
<td>Refer to: r9744, r9747, r9749, p9752, r9753, r9754, r9755, r9756</td>
<td></td>
</tr>
</tbody>
</table>
### List of parameters

#### r9749[0...63] SI message value / SI msg_value

<table>
<thead>
<tr>
<th>Parameter Name</th>
<th>Type</th>
<th>Access level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>r9749</td>
<td>Integer32</td>
<td>3</td>
<td>Displays the additional information about the safety message that occurred (as integer number).</td>
</tr>
</tbody>
</table>

Dependency: Refer to: r9744, r9747, r9748, p9752, r9753, r9754, r9755, r9756

#### r9750[0...63] SI diagnostic attributes / SI diag_attr

<table>
<thead>
<tr>
<th>Parameter Name</th>
<th>Type</th>
<th>Access level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>r9750</td>
<td>Unsigned32</td>
<td>3</td>
<td>Displays the diagnostic attributes of the safety messages that have occurred.</td>
</tr>
</tbody>
</table>

Bit field: 00 - Hardware replacement recommended 1 signal 0 signal FP

#### p9752 SI message cases, counter / SI msg_cases count

<table>
<thead>
<tr>
<th>Parameter Name</th>
<th>Type</th>
<th>Access level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>p9752</td>
<td>Unsigned16</td>
<td>3</td>
<td>Number of safety messages that have occurred since the last reset.</td>
</tr>
</tbody>
</table>

Dependency: The safety message buffer is cleared by resetting the parameter to 0. Refer to: r9744, r9747, r9748, r9749, r9753, r9754, r9755, r9756

Note: The parameter is reset to 0 at POWER ON.

#### r9753[0...63] SI message value for float values / SI msg_val float

<table>
<thead>
<tr>
<th>Parameter Name</th>
<th>Type</th>
<th>Access level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>r9753</td>
<td>FloatingPoint32</td>
<td>3</td>
<td>Displays additional information about the safety message that has occurred for float values.</td>
</tr>
</tbody>
</table>

Dependency: Refer to: r9744, r9747, r9748, r9749, p9752, r9754, r9755, r9756

#### r9754[0...63] SI message time received in days / SI t_msg_recv days

<table>
<thead>
<tr>
<th>Parameter Name</th>
<th>Type</th>
<th>Access level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>r9754</td>
<td>Unsigned16</td>
<td>3</td>
<td>Displays the relative system runtime in days when the safety message occurred.</td>
</tr>
</tbody>
</table>

Dependency: Refer to: r9744, r9747, r9748, r9749, p9752, r9754, r9755, r9756
### Parameter

#### List of parameters

#### Dependency:
Refer to: r9744, r9747, r9748, r9749, p9752, r9753, r9755, r9756

#### r9755[0...63] SI message time removed in milliseconds / SI t_msg rem ms

<table>
<thead>
<tr>
<th>Description</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Displays the relative system runtime in milliseconds when the safety message was removed.</td>
<td>- [ms] - [ms] - [ms]</td>
</tr>
</tbody>
</table>

### Dependency:
Refer to: r9744, r9747, r9748, r9749, p9752, r9753, r9754, r9756

#### r9756[0...63] SI message time removed in days / SI t_msg rem days

<table>
<thead>
<tr>
<th>Description</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Displays the relative system runtime in days when the safety message was removed.</td>
<td>- - -</td>
</tr>
</tbody>
</table>

### Dependency:
Refer to: r9744, r9747, r9748, r9749, p9752, r9753, r9754, r9755

#### p9761 SI password input / SI password inp

<table>
<thead>
<tr>
<th>Description</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enters the Safety Integrated password.</td>
<td>0000 hex FFFF FFFF hex 0000 hex</td>
</tr>
</tbody>
</table>

### Dependency:
Refer to: F01659

### Note:
It is not possible to change Safety Integrated parameters until the Safety Integrated password has been entered.

#### p9762 SI password new / SI password new

<table>
<thead>
<tr>
<th>Description</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enters a new Safety Integrated password.</td>
<td>0000 hex FFFF FFFF hex 0000 hex</td>
</tr>
</tbody>
</table>

### Dependency:
A change made to the Safety Integrated password must be acknowledged in the following parameter:
Refer to: p9763

#### p9763 SI password acknowledgement / SI ackn password

<table>
<thead>
<tr>
<th>Description</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acknowledges the new Safety Integrated password.</td>
<td>0000 hex FFFF FFFF hex 0000 hex</td>
</tr>
</tbody>
</table>

#### Dependency:
Refer to: p9763
### r9765

**SI Motion forced check procedure remaining time (Control Unit) / SI Mtn dyn remain**

**Dependency:**
Refer to: p9762

**Note:**
The new password entered into p9762 must be re-entered in order to acknowledge.
p9762 = p9763 = 0 is automatically set after the new Safety Integrated password has been successfully acknowledged.

**Description:**
Displays the time remaining until the next dynamization and testing of the safety motion monitoring functions integrated in the drives.
The signal source to initiate the forced checking procedure is parameterized in p9705.

**Dependency:**
Refer to: p9705
Refer to: C01798

### r9770[0...3]

**SI vers. safety fcts that run indep. in the drive (processor 1) / SI version Drv P1**

**Dependency:**
Refer to: r9890

**Note:**
Example:
r9770[0] = 2, r9770[1] = 60, r9770[2] = 1, r9770[3] = 0 --> Safety version V02.60.01.00

### r9771

**SI common functions (processor 1) / SI general fct P1**

**Dependency:**
Processor 1 determines this display.

**Note:**
Example:
r9771[0] = 2, r9771[1] = 60, r9771[2] = 1, r9771[3] = 0 --> Safety version V02.60.01.00

### Bit field

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>STO supported via terminals</td>
<td>Yes</td>
<td>No</td>
<td>2804</td>
</tr>
<tr>
<td>01</td>
<td>SBC supported</td>
<td>Yes</td>
<td>No</td>
<td>2804</td>
</tr>
<tr>
<td>02</td>
<td>Extended Functions supported (p9501 &gt; 0)</td>
<td>Yes</td>
<td>No</td>
<td>2804</td>
</tr>
<tr>
<td>03</td>
<td>SS1 supported</td>
<td>Yes</td>
<td>No</td>
<td>2804</td>
</tr>
<tr>
<td>04</td>
<td>Extended Functions PROFlsafe supported</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>05</td>
<td>Extended Functions integrated in drive supported (p9601.2 = 1)</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>06</td>
<td>Basic Functions PROFlsafe supported</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>07</td>
<td>Extended Functions encoderless supported</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>08</td>
<td>Safe Brake Adapter supported</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
</tbody>
</table>
### Parameter

#### List of parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>09</td>
<td>Basic Functions PROFIsafe for parallel connection supported</td>
</tr>
<tr>
<td>10</td>
<td>Extended Functions integrated in drive for parallel connection</td>
</tr>
<tr>
<td>11</td>
<td>Extended Functions SDI supported</td>
</tr>
<tr>
<td>12</td>
<td>Extended Functions SSM encoderless supported</td>
</tr>
</tbody>
</table>

**Dependency:** Refer to: r9871

**Note:**
- SBC: Safe Brake Control
- SS1: Safe Stop 1
- STO: Safe Torque Off

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>r9772.0...23</td>
<td>CO/BO: SI status (processor 1) / SI status P1</td>
</tr>
</tbody>
</table>

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

- Can be changed: -
- Calculated: -
- Access level: 2
- Data type: Unsigned32
- Dynamic index: -
- Func. diagram: 2804
- P-Group: Safety Integrated
- Units group: -
- Unit selection: -
- Not for motor type: -
- Scaling: -
- Expert list: 1

**Description:** Displays the Safety Integrated status on processor 1.

**Bit field:**

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>STO selected on Control Unit</td>
<td>Yes</td>
<td>No</td>
<td>2810</td>
</tr>
<tr>
<td>01</td>
<td>STO active on Control Unit</td>
<td>Yes</td>
<td>No</td>
<td>2810</td>
</tr>
<tr>
<td>02</td>
<td>SS1 delay time active on the Control Unit</td>
<td>Yes</td>
<td>No</td>
<td>2810</td>
</tr>
<tr>
<td>04</td>
<td>SBC requested</td>
<td>Yes</td>
<td>No</td>
<td>2814</td>
</tr>
<tr>
<td>05</td>
<td>SS1 selected on the Control Unit (Basic Functions)</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>06</td>
<td>SS1 active on the Control Unit (Basic Functions)</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>09</td>
<td>STOP A cannot be acknowledged, active</td>
<td>Yes</td>
<td>No</td>
<td>2802</td>
</tr>
<tr>
<td>10</td>
<td>STOP A active</td>
<td>Yes</td>
<td>No</td>
<td>2802</td>
</tr>
<tr>
<td>15</td>
<td>STOP F active</td>
<td>Yes</td>
<td>No</td>
<td>2802</td>
</tr>
<tr>
<td>16</td>
<td>STO cse: Safety comm. mode</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>17</td>
<td>STO cause selection via terminal (Basic Functions)</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>18</td>
<td>STO cause: selection via SMM</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>19</td>
<td>STO cause actual value missing</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>20</td>
<td>STO cause selection PROFIsafe (Basic Functions)</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>22</td>
<td>SS1 cause selection terminal (Basic Functions)</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>23</td>
<td>SS1 cause selection PROFIsafe (Basic Functions)</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
</tbody>
</table>

**Dependency:** Refer to: r9872

**Note:**
- When STO is selected, the cause is displayed in bits 16 ... 20.
- Re bit 00:
- When SS1 is selected, the cause is displayed in bits 22 and 23.
- Re bit 18:
- When the bit is set, STO is selected via PROFIsafe.
- Re bit 19:
  - With SMM encoderless no actual value sensing is possible on account of OFF2.
  - With SMM with encoder no actual value sensing is possible on account of parking.
  - SMM: Safe Motion Monitoring
### r9773.0...31  CO/BO: SI status (processor 1 + processor 2) / SI status P1+P2

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Bit field</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>r9773.0...31</td>
<td>Displays the Safety Integrated status on the drive (processor 1 + processor 2).</td>
<td></td>
<td>This status is formed from the AND operation of the relevant status of the two monitoring channels.</td>
</tr>
</tbody>
</table>

#### Bit field:
- **00**: STO selected in drive
- **01**: STO active in drive
- **02**: SS1 delay time active in the drive
- **04**: SBC requested
- **05**: SS1 selected in the drive (Basic Functions)
- **06**: SS1 active in the drive (Basic Functions)
- **31**: Shutdown paths must be tested

### r9776  SI diagnostics / SI diagnostics

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Bit field</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>r9776</td>
<td>The parameter is used for diagnostics.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Bit field:
- **00**: Safety parameter changed POWER ON required

### r9780  SI monitoring clock cycle (Control Unit) / SI monitor_clck CU

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
</tr>
</thead>
<tbody>
<tr>
<td>r9780</td>
<td>Displays the clock cycle time for the Safety Integrated Basic Functions on the Control Unit.</td>
<td>Refer to: r9880</td>
</tr>
</tbody>
</table>

### r9781[0...1]  SI checksum to check changes (Control Unit) / SI chg chksm CU

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>r9781[0...1]</td>
<td>Displays the checksum for tracking changes for Safety Integrated.</td>
<td>These are additional checksums that are created to track changes (fingerprint for the &quot;safety logbook&quot; functionality) to safety parameters (that are relevant for checksums).</td>
</tr>
</tbody>
</table>
### p9783  
**SI motion synchr. motor current injection sensorless / SI Mtn SM Id SL**

- **Can be changed:** U, T
- **Data type:** FloatingPoint32
- **P-Group:** Safety Integrated
- **Not for motor type:** -
- **Min:** -50.00 [%]  
- **Max:** 0.00 [%]  
- **Factory setting:** -20.00 [%]

**Description:**
Sets the field-generating current for sensorless actual value sensing of synchronous motors.  
For synchronous motors, this current is fed in using sensorless safety functions.  
The value must fulfill the following condition: \(|p0305 \times p9783| \geq p9588 \times 1.2\)

**Dependency:**
Refer to: p9588  
Refer to: C01711

**Notice:**
Reducing this percentage value can adversely affect actual value sensing with synchronous motors.  
If the value is increased, this results in an increased motor power loss.

**Note:**
This parameter is only effective for encoderless actual value sensing (p9306/p9506 = 1).

### r9794[0...19]  
**SI crosswise comparison list (processor 1) / SI CDC_list P1**

- **Can be changed:** -
- **Data type:** Unsigned16
- **P-Group:** Safety Integrated
- **Not for motor type:** -
- **Min:** -
- **Max:** -

**Description:**
Displays the numbers of the data items that are currently being compared crosswise on processor 1.  
The content of the list of crosswise-compared data is dependent upon the particular application.

**Dependency:**
Refer to: r9894

**Note:**
Example:  
r9794[0] = 1 (monitoring clock cycle)  
r9794[1] = 2 (enable safety functions)  
r9794[2] = 3 (F-DI changeover, tolerance time)  

A complete list of numbers for crosswise-compared data items appears in fault F01611.
### List of Parameters

#### Parameter r9795

**SI diagnostics STOP F (Control Unit) / SI diag STOP F CU**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed:</td>
<td>-</td>
</tr>
<tr>
<td>Calculated:</td>
<td>-</td>
</tr>
<tr>
<td>Access level:</td>
<td>2</td>
</tr>
<tr>
<td>Data type:</td>
<td>Unsigned32</td>
</tr>
<tr>
<td>Dynamic index:</td>
<td>-</td>
</tr>
<tr>
<td>P-Group:</td>
<td>Safety Integrated</td>
</tr>
<tr>
<td>Units group:</td>
<td>-</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Description:** Displays the number of the cross-checked data which has caused STOP F on the Control Unit.

**Dependency:**
- Refer to: r9895
- Refer to: F01611

**Note:**
- A complete list of numbers for crosswise-compared data items appears in fault F01611.

#### Parameter r9798

**SI actual checksum SI parameters (Control Unit) / SI act_checksum CU**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed:</td>
<td>-</td>
</tr>
<tr>
<td>Calculated:</td>
<td>-</td>
</tr>
<tr>
<td>Access level:</td>
<td>3</td>
</tr>
<tr>
<td>Data type:</td>
<td>Unsigned32</td>
</tr>
<tr>
<td>Dynamic index:</td>
<td>-</td>
</tr>
<tr>
<td>P-Group:</td>
<td>Safety Integrated</td>
</tr>
<tr>
<td>Units group:</td>
<td>-</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Description:** Displays the checksum over the checked Safety Integrated parameters on the Control Unit (actual checksum).

**Dependency:**
- Refer to: p9799, r9898

#### Parameter p9799

**SI reference checksum SI parameters (Control Unit) / SI set_checksum CU**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed:</td>
<td>C2(95)</td>
</tr>
<tr>
<td>Calculated:</td>
<td>-</td>
</tr>
<tr>
<td>Access level:</td>
<td>3</td>
</tr>
<tr>
<td>Data type:</td>
<td>Unsigned32</td>
</tr>
<tr>
<td>Dynamic index:</td>
<td>-</td>
</tr>
<tr>
<td>P-Group:</td>
<td>Safety Integrated</td>
</tr>
<tr>
<td>Units group:</td>
<td>-</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td>0000 hex</td>
<td>FFFF FFFF hex</td>
</tr>
</tbody>
</table>

**Description:**
Sets the checksum for the checked Safety Integrated parameters on the Control Unit (reference checksum).

**Dependency:**
- Refer to: p9799, p9899

#### Parameter p9801

**SI enable, functions integrated in the drive (processor 2) / SI enable fct P2**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed:</td>
<td>C2(95)</td>
</tr>
<tr>
<td>Calculated:</td>
<td>-</td>
</tr>
<tr>
<td>Access level:</td>
<td>3</td>
</tr>
<tr>
<td>Data type:</td>
<td>Unsigned16</td>
</tr>
<tr>
<td>Dynamic index:</td>
<td>-</td>
</tr>
<tr>
<td>P-Group:</td>
<td>Safety Integrated</td>
</tr>
<tr>
<td>Units group:</td>
<td>-</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Description:**
Sets the enable signals for safety functions on processor 2 that are integrated in the drive.

**Dependency:**
- Refer to: p9601, r9871

**Notice:**
This parameter is overwritten by the copy function of the safety functions integrated in the drive.

**Note:**
- STO: Safe Torque Off
- SMM: Safe Motion Monitoring
- A change only becomes effective after a POWER ON.
**p9801**  
**SI enable, functions integrated in the drive (processor 2) / SI enable fct P2**

**SERVO_S110-DP, SERVO_S110-PN**

**Can be changed:** C2(95)  
**Calculated:** -  
**Access level:** 3

**Data type:** Unsigned16  
**Dynamic index:** -  
**Func. diagram:** -

**P-Group:** Safety Integrated  
**Units group:** -  
**Unit selection:** -

**Not for motor type:** -  
**Scaling:** -  
**Expert list:** 1

**Min**  
**Max**  
**Factory setting**  
0000 bin

**Description:**  
Sets the enable signals for safety functions on processor 2 that are integrated in the drive. Not all possible settings may be permissible, depending on the Control Unit and Motor Module or Power Module being used.

**Dependency:**  
Refer to: p9601, r9871

**Notice:**  
This parameter is overwritten by the copy function of the safety functions integrated in the drive.

**Note:**  
STO: Safe Torque Off  
SMM: Safe Motion Monitoring  
A change only becomes effective after a POWER ON.

**p9802**  
**SI enable Safe Brake Control (processor 2) / SI enable SBC P2**

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

**Can be changed:** C2(95)  
**Calculated:** -  
**Access level:** 3

**Data type:** Integer32  
**Dynamic index:** -  
**Func. diagram:** 2814

**P-Group:** Safety Integrated  
**Units group:** -  
**Unit selection:** -

**Not for motor type:** -  
**Scaling:** -  
**Expert list:** 1

**Min**  
**Max**  
**Factory setting**  
0 1 0

**Description:**  
Sets the enable signal for the "Safe Brake Control" (SBC) function on processor 2.  
0: Inhibit SBC  
1: Enable SBC

**Dependency:**  
Refer to: p9602

**Notice:**  
This parameter is overwritten by the copy function of the safety functions integrated in the drive.

**Note:**  
The "Safe Brake Control" function is not activated until at least one safety monitoring function has been enabled (i.e. p9501 not equal to 0 and/or p9801 not equal to 0).  
It does not make sense to parameterize "no motor holding brake available" and enable "Safe Brake Control" (p1215 = 0, p9602 = p9802 = 1) if there is no motor holding brake.  
It does not make sense to parameterize "motor holding brake the same as sequence control, connection via BICO" and enable "Safe Brake Control" (p1215 = 3, p9602 = p9802 = 1).  
It is not permissible to parameterize "motor holding brake without feedback signals" and enable "Safe Brake Control" (p1278 = 1, p9602 = p9802 = 1).  
SBC: Safe Brake Control

**p9810**  
**SI PROFIsafe address (processor 2) / SI PROFIsafe P2**

**SERVO_S110-DP, SERVO_S110-PN**

**Can be changed:** C2(95)  
**Calculated:** -  
**Access level:** 3

**Data type:** Unsigned16  
**Dynamic index:** -  
**Func. diagram:** -

**P-Group:** Safety Integrated  
**Units group:** -  
**Unit selection:** -

**Not for motor type:** -  
**Scaling:** -  
**Expert list:** 1

**Min**  
**Max**  
**Factory setting**  
0000 hex  
0FFE hex  
0000 hex

**Description:**  
Sets the PROFIsafe address on processor 2.

**Notice:**  
This parameter is overwritten by the copy function of the safety functions integrated in the drive.
### p9850  SI F-DI changeover tolerance time (processor 2) / SI F-DI_chg tol P2

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Type</th>
<th>Access</th>
<th>Dynamic Index</th>
<th>Units Group</th>
<th>Expert List</th>
</tr>
</thead>
<tbody>
<tr>
<td>p9850</td>
<td>Can be changed: C2(95)</td>
<td>Calculated: -</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td>Dynamic index: -</td>
<td>Dynamic index: -</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
<td>1</td>
</tr>
<tr>
<td>P-Group: Safety Integrated</td>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td>0.00 [µs]</td>
<td>2000000.00 [µs]</td>
<td>500000.00 [µs]</td>
</tr>
</tbody>
</table>

**Description:**
Sets the tolerance time for the changeover of the safety-related inputs on processor 2. An F-DI changeover is not effective simultaneously due to the different runtimes in the two monitoring channels. After an F-DI changeover, dynamic data is not subject to a crosswise data comparison during this tolerance time.

**Dependency:**
Refer to: p9650

**Notice:**
This parameter is overwritten by the copy function of the safety functions integrated in the drive.

**Note:**
For a crosswise data comparison between p9650 and p9850, a difference of one Safety monitoring clock cycle is tolerated.

The parameterized time is internally rounded-off to an integer multiple of the monitoring clock cycle.

**F-DI:** Failsafe Digital Input

### p9851  SI STO/SBC/SS1 debounce time (processor 2) / SI STO t_debou P2

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Type</th>
<th>Access</th>
<th>Dynamic Index</th>
<th>Units Group</th>
<th>Expert List</th>
</tr>
</thead>
<tbody>
<tr>
<td>p9851</td>
<td>Can be changed: C2(95)</td>
<td>Calculated: -</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td>Dynamic index: -</td>
<td>Dynamic index: -</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
<td>1</td>
</tr>
<tr>
<td>P-Group: Safety Integrated</td>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td>0.00 [µs]</td>
<td>1000000.00 [µs]</td>
<td>0.00 [µs]</td>
</tr>
</tbody>
</table>

**Description:**
Sets the debounce time for the digital input used to control STO/SBC/SS1.

**Notice:**
This parameter is overwritten by the copy function of the safety functions integrated in the drive.

**Note:**
The debounce time is rounded to whole milliseconds. It specifies the maximum duration of a fault pulse at the failsafe digital inputs with no reaction/influence on the selection or deselection of the Safety Basic Functions.

Example:
Debounce time = 1 ms: Fault pulses of 1 ms are filtered; only pulses longer than 2 ms are processed.
Debounce time = 3 ms: Fault pulses of 3 ms are filtered; only pulses longer than 4 ms are processed.

### p9852  SI Safe Stop 1 delay time (processor 2) / SI Stop 1 t_del P2

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Type</th>
<th>Access</th>
<th>Dynamic Index</th>
<th>Units Group</th>
<th>Expert List</th>
</tr>
</thead>
<tbody>
<tr>
<td>p9852</td>
<td>Can be changed: C2(95)</td>
<td>Calculated: -</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td>Dynamic index: -</td>
<td>Dynamic index: -</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
<td>1</td>
</tr>
<tr>
<td>P-Group: Safety Integrated</td>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td>0.00 [ms]</td>
<td>300000.00 [ms]</td>
<td>0.00 [ms]</td>
</tr>
</tbody>
</table>

**Description:**
Sets the delay time of the pulse suppression for the "Safe Stop 1" (SS1) function on processor 2 to brake along the OFF3 down ramp (p1135).

**Recommend.:**
In order that the drive can completely ramp-down along the OFF3 ramp and a motor holding brake that is possibly available can close, then the delay time should be set as follows:
Motor holding brake parameterized: delay time >= p1135 + p1228 + p1217
Motor holding brake not parameterized: delay time >= p1135 + p1228

**Dependency:**
Refer to: p1135, p9652

**Notice:**
This parameter is overwritten by the copy function of the safety functions integrated in the drive.

**Note:**
For a crosswise data comparison between p9652 and p9852, a difference of one Safety monitoring clock cycle is tolerated.

The parameterized time is rounded internally to an integer multiple of the monitoring clock cycle.

SS1: Safe Stop 1 (corresponds to Stop Category 1 acc. to EN60204)
### p9858
**SI transition time STOP F to STOP A (processor 2) / SI STOP F->A P2**

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
<th>Can be changed: C2(95)</th>
<th>Calculated: -</th>
<th>Access level: 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Data type:</strong> FloatingPoint32</td>
<td><strong>Dynamic index:</strong> -</td>
<td><strong>Func. diagram:</strong> 2802</td>
<td></td>
</tr>
<tr>
<td><strong>P-Group:</strong> Safety Integrated</td>
<td><strong>Units group:</strong> -</td>
<td><strong>Unit selection:</strong> -</td>
<td></td>
</tr>
<tr>
<td><strong>Not for motor type:</strong> -</td>
<td><strong>Scaling:</strong> -</td>
<td><strong>Expert list:</strong> 1</td>
<td></td>
</tr>
<tr>
<td><strong>Min</strong></td>
<td><strong>Max</strong></td>
<td><strong>Factory setting</strong></td>
<td></td>
</tr>
<tr>
<td>0.00 [µs]</td>
<td>30000000.00 [µs]</td>
<td>0.00 [µs]</td>
<td></td>
</tr>
</tbody>
</table>

**Description:**
Sets the transition period from STOP F to STOP A on processor 2.

**Dependency:**
- Refer to: p9658, r9859
- Refer to: F30611

**Notice:**
This parameter is overwritten by the copy function of the safety functions integrated in the drive.

**Note:**
For a crosswise data comparison between p9658 and p9858, a difference of one Safety monitoring clock cycle is tolerated.

The parameterized time is rounded internally to an integer multiple of the monitoring clock cycle.

**STOP F:** Defect in a monitoring channel (error in the crosswise data comparison)

**STOP A:** Pulse suppression via the safety shutdown path

### r9871
**SI common functions (processor 2) / SI common fct P2**

<table>
<thead>
<tr>
<th>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</th>
<th>Can be changed: -</th>
<th>Calculated: -</th>
<th>Access level: 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Data type:</strong> Unsigned32</td>
<td><strong>Dynamic index:</strong> -</td>
<td><strong>Func. diagram:</strong> 2804</td>
<td></td>
</tr>
<tr>
<td><strong>P-Group:</strong> Safety Integrated</td>
<td><strong>Units group:</strong> -</td>
<td><strong>Unit selection:</strong> -</td>
<td></td>
</tr>
<tr>
<td><strong>Not for motor type:</strong> -</td>
<td><strong>Scaling:</strong> -</td>
<td><strong>Expert list:</strong> 1</td>
<td></td>
</tr>
<tr>
<td><strong>Min</strong></td>
<td><strong>Max</strong></td>
<td><strong>Factory setting</strong></td>
<td></td>
</tr>
<tr>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

**Description:**
Displays the Safety Integrated monitoring functions supported on processor 1 and processor 2.

**Bit field:**

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>STO supported via terminals</td>
<td>Yes</td>
<td>No</td>
<td>2804</td>
</tr>
<tr>
<td>01</td>
<td>SBC supported</td>
<td>Yes</td>
<td>No</td>
<td>2804</td>
</tr>
<tr>
<td>02</td>
<td>Extended Functions supported (p9501 &gt; 0)</td>
<td>Yes</td>
<td>No</td>
<td>2804</td>
</tr>
<tr>
<td>03</td>
<td>SS1 supported</td>
<td>Yes</td>
<td>No</td>
<td>2804</td>
</tr>
<tr>
<td>04</td>
<td>Extended Functions PROFIsafe supported</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>05</td>
<td>Extended Functions integrated in drive supported (p9801.2 = 1)</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>06</td>
<td>Basic Functions PROFIsafe supported</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>07</td>
<td>Extended Functions encoderless supported</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>08</td>
<td>Safe Brake Adapter supported</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>09</td>
<td>Basic Functions PROFIsafe for parallel connection supported</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>10</td>
<td>Extended Functions integrated in drive for parallel connection</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>11</td>
<td>Extended Functions SDI supported</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>12</td>
<td>Extended Functions SSM encoderless supported</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
</tbody>
</table>

**Dependency:**
- Refer to: r9771

**Note:**
- MM: Motor Module
- SBC: Safe Brake Control
- SDI: Safe Direction (safe motion direction)
- SI: Safety Integrated
- SS1: Safe Stop 1
- STO: Safe Torque Off / SH: Safe standstill
- SSM: Safe Speed Monitor (safety-relevant feedback signal from the velocity monitoring) / SGA n < nx: Safety-related output n < nx
- ESR: Extended Stop and Retract
### List of parameters

**r9872.0...24**  
**CO/BO: SI status (processor 2) / SI Status P2**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Notice</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>r9872.0...24</td>
<td><strong>Can be changed:</strong></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>SERVO_S110-CAN</td>
<td><strong>Data type:</strong> Unsigned32</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>SERVO_S110-DP</td>
<td><strong>Dependency:</strong> Refer to: r9772</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>SERVO_S110-PN</td>
<td><strong>Notice:</strong> If communication between processor 1 and processor 2 is interrupted, then this display parameter is no longer updated. The last transferred status of processor 2 is displayed.</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td><strong>Bit field:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Description:</strong> Displays the Safety Integrated status on processor 2.</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td><strong>Bit Signal name</strong></td>
<td><strong>1 signal</strong></td>
<td><strong>0 signal</strong></td>
<td><strong>FP</strong></td>
</tr>
<tr>
<td>00</td>
<td>STO on Motor Module selected</td>
<td>Yes</td>
<td>No</td>
<td>2810</td>
</tr>
<tr>
<td>01</td>
<td>STO on Motor Module active</td>
<td>Yes</td>
<td>No</td>
<td>2810</td>
</tr>
<tr>
<td>02</td>
<td>SS1 delay time on Motor Module active</td>
<td>Yes</td>
<td>No</td>
<td>2810</td>
</tr>
<tr>
<td>03</td>
<td>Safe Brake Adapter feedback signal</td>
<td>Yes</td>
<td>No</td>
<td>2814</td>
</tr>
<tr>
<td>04</td>
<td>SBC requested</td>
<td>Yes</td>
<td>No</td>
<td>2814</td>
</tr>
<tr>
<td>05</td>
<td>SS1 selected on the Motor Module (Basic Functions)</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>06</td>
<td>SS1 active on the Motor Module (Basic Functions)</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>09</td>
<td>STOP A cannot be acknowledged, active</td>
<td>Yes</td>
<td>No</td>
<td>2802</td>
</tr>
<tr>
<td>10</td>
<td>STOP A active</td>
<td>Yes</td>
<td>No</td>
<td>2802</td>
</tr>
<tr>
<td>15</td>
<td>STOP F active</td>
<td>Yes</td>
<td>No</td>
<td>2802</td>
</tr>
<tr>
<td>16</td>
<td>STO cse: Safety comm. mode</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>17</td>
<td>STO cause selection via terminal (Basic Functions)</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>18</td>
<td>STO cause: selection via SMM</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>20</td>
<td>STO cause selection PROFIsafe (Basic Functions)</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>22</td>
<td>SS1 cause selection terminal (Basic Functions)</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>23</td>
<td>SS1 cause selection PROFIsafe (Basic Functions)</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>24</td>
<td>Slave Motor Module ready for communication</td>
<td>Yes</td>
<td>No</td>
<td>-</td>
</tr>
</tbody>
</table>

**Dependency:** Refer to: r9772

**Notice:**

If communication between processor 1 and processor 2 is interrupted, then this display parameter is no longer updated. The last transferred status of processor 2 is displayed.

**Note:**

Re bit 00:

When STO is selected, the cause is displayed in bits 16 ... 18 and in bit 20.

Re bit 05:

When SS1 is selected, the cause is displayed in bits 22 and 23.

Re bit 18:

When the bit is set, STO is selected via PROFIsafe.

SMM: Safe Motion Monitoring

---

**r9880**  
**SI monitoring clock cycle (processor 2) / SI mon_clk cyc P2**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Dependency</th>
<th>Notice</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>r9880</td>
<td><strong>Can be changed:</strong></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>SERVO_S110-CAN</td>
<td><strong>Data type:</strong> FloatingPoint32</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>SERVO_S110-DP</td>
<td><strong>Dependency:</strong> Refer to: r9780</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>SERVO_S110-PN</td>
<td><strong>Notice:</strong></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td><strong>Bit field:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Description:</strong> Displays the clock cycle time for the Safety Integrated Basic Functions on processor 2.</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

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SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3
### Parameter List

#### r9881[0...11] SI Motion Sensor Module Node Identifier second channel / SI Mtn SM Ident

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Displays the Node Identifier of the Sensor Module that the second channel uses for the motion monitoring functions.</td>
<td>-</td>
<td>-</td>
<td>3</td>
</tr>
</tbody>
</table>

**Data type:** Unsigned8  
**P-Group:** Safety Integrated  
**Not for motor type:** -  
**Min:** -  
**Max:** -  
**Index:** [0] = Safety Version (major release), [1] = Safety Version (minor release), [2] = Safety Version (baselevel or patch)

#### r9890[0...2] SI version (Sensor Module) / SI version SM

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Displays the Safety Integrated version on the Sensor Module.</td>
<td>-</td>
<td>-</td>
<td>3</td>
</tr>
</tbody>
</table>

**Data type:** Unsigned16  
**P-Group:** Safety Integrated  
**Not for motor type:** -  
**Min:** -  
**Max:** -  
**Index:** [0] = Safety Version (major release), [1] = Safety Version (minor release), [2] = Safety Version (baselevel or patch)

**Dependency:** Refer to: r9770  
**Note:** Example: r9890[0] = 2, r9890[1] = 3, r9890[2] = 1 --> Safety-Version V02.03.01

#### r9894[0...19] SI crosswise comparison list (processor 2) / SI CDC_list P2

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Displays the numbers of the data items that are currently being compared crosswise on processor 2. The content of the list of crosswise-compared data is dependent upon the particular application.</td>
<td>-</td>
<td>-</td>
<td>3</td>
</tr>
</tbody>
</table>

**Data type:** Unsigned16  
**P-Group:** Safety Integrated  
**Not for motor type:** -  
**Min:** -  
**Max:** -  
**Dependency:** Refer to: r9794  
**Note:** Example: r9894[0] = 1 (monitoring clock cycle), r9894[1] = 2 (enable safety functions), r9894[2] = 3 (F-DI changeover, tolerance time)  
... The complete list of numbers for crosswise data comparison is listed in Fault F30611.

#### r9895 SI diagnostics STOP F (processor 2) / SI diag STOP F P2

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>Displays the number of the cross-checked data item which caused STOP F on processor 2.</td>
<td>-</td>
<td>-</td>
<td>2</td>
</tr>
</tbody>
</table>

**Data type:** Unsigned32  
**P-Group:** Safety Integrated  
**Not for motor type:** -  
**Min:** -  
**Max:** -  
**Dependency:** Refer to: r9795  
Refer to: F30611
### Note:
The complete list of numbers for crosswise data comparison is listed in Fault F30611.

### r9898  
**SI actual checksum SI parameters (processor 2) / SI act_chksm P2**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Can be changed</th>
<th>Calculated</th>
<th>P-Group</th>
<th>Not for motor type</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>-</td>
<td>-</td>
<td>Safety Integrated</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Data type: Unsigned32</td>
<td>Dynamic index: -</td>
<td>Units group: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>-</td>
<td>Factory setting</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Displays the checksum for the Safety Integrated parameters checked using checksums on processor 2 (actual checksum).

**Dependency:** Refer to: r9798, p9899

### p9899  
**SI setpoint checksum SI parameters (processor 2) / SI setp_chksm P2**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Can be changed</th>
<th>Calculated</th>
<th>P-Group</th>
<th>Not for motor type</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>C2(95)</td>
<td>-</td>
<td>Safety Integrated</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Data type: Unsigned32</td>
<td>Dynamic index: -</td>
<td>Units group: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>FFFF FFFF hex</td>
<td>Factory setting</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Sets the checksum for the Safety Integrated parameters checked using checksums on processor 2 (setpoint checksum).

**Dependency:** Refer to: p9798, r9899

### r9900  
**Actual topology number of indices / Act topo indices**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Can be changed</th>
<th>Calculated</th>
<th>P-Group</th>
<th>Not for motor type</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>CU_S110-CAN, CU_S110-DP, CU_S110-PN</td>
<td>-</td>
<td>-</td>
<td>Topology</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Data type: Unsigned16</td>
<td>Dynamic index: -</td>
<td>Units group: -</td>
<td>Scaling: -</td>
<td>Expert list: 0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>-</td>
<td>Factory setting</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Displays the number of indices of the actual topology.

**Dependency:** Refer to: r9901

**Note:** Only for internal Siemens use.

The parameter is not displayed for the STARTER commissioning software.

### r9901[0...n]  
**Actual topology / Act topo**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Can be changed</th>
<th>Calculated</th>
<th>P-Group</th>
<th>Not for motor type</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>CU_S110-CAN, CU_S110-DP, CU_S110-PN</td>
<td>-</td>
<td>-</td>
<td>Topology</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Data type: Unsigned16</td>
<td>Dynamic index: r9900</td>
<td>Units group: -</td>
<td>Scaling: -</td>
<td>Expert list: 0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>-</td>
<td>Factory setting</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Displays the actual topology of the drive unit.

The actual topology is sub-divided into several sections. Each of the following data is saved under an index.

General data on the topology:
- version
- attribute to compare the actual topology and target topology
- number of components

Data on a component:
- type component of the node ID of the component
- number of DRIVE-CLiQ sockets in the Node Identifier
- manufacturer and version of the Node Identifier

---

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SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3 1-611
**Parameter**

**List of parameters**

- serial number of the Node Identifier (4 indices)
- index of the component
- order number (8 indices)
- attribute to compare the actual topology and target topology of the component
- communications address
- number of port types
  - port type
  - number of ports of the port type
- communications address of the associated/linked component
- number of the associated/linked port
- communications address of the associated/linked component
- number of the associated port, etc.

Data on the next component:
- etc.

**Dependency:**
Refer to: r9900

**Note:**
Only for internal Siemens use.

The parameter is not displayed for the STARTER commissioning software.

---

**p9902**

**Target topology number of indices / TargetTopo indices**

| CU_S110-CAN, | Can be changed: - | Calculated: - | Access level: 3 |
| CU_S110-DP, | Data type: Unsigned16 | Dynamic index: - | Func. diagram: - |
| CU_S110-PN | P-Group: Topology | Units group: - | Unit selection: - |
| Not for motor type: - | Scaling: - | Expert list: 0 |

**Min**

<table>
<thead>
<tr>
<th>1</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>65535</td>
<td>1</td>
</tr>
</tbody>
</table>

**Description:**
Sets the number of target topology indices.

**Dependency:**
Refer to: p9903

**Note:**
Only for internal Siemens use.

The parameter is not displayed for the STARTER commissioning software.

---

**p9903[0...n]**

**Target topology / Target topo**

| CU_S110-CAN, | Can be changed: - | Calculated: - | Access level: 3 |
| CU_S110-DP, | Data type: Unsigned16 | Dynamic index: p9902 | Func. diagram: - |
| CU_S110-PN | P-Group: Topology | Units group: - | Unit selection: - |
| Not for motor type: - | Scaling: - | Expert list: 0 |

**Min**

<table>
<thead>
<tr>
<th>0000 hex</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>FFFF hex</td>
<td>0000 hex</td>
</tr>
</tbody>
</table>

**Description:**
Sets the target topology of the drive unit.

The target topology is sub-divided into several sections. Each of the following data is saved under an index.

**General data on the topology:**
- version
- attribute to compare the actual topology and target topology
- number of components

**Data on a component:**
- type component of the Node Identifier of the component
- number of DRIVE-CLIQ sockets in the Node Identifier
- manufacturer and version of the Node Identifier
- serial number of the Node Identifier (4 indices)
- index of the component
- order number (8 indices)
- attribute to compare the actual topology and target topology of the component
- component number
- number of port types
Parameter

List of parameters

- port type
- number of ports of the port type
- component number of the associated/linked component
- number of the associated/linked port
- component number of the associated/linked component
- number of the associated port, etc.
Data on the next component:
- etc.

Dependency:
Refer to: p9902

Note:
The target topology can only be modified using the commissioning software.
Only for internal Siemens use.
The parameter is not displayed for the STARTER commissioning software.
Changes do not become effective until they have been accepted with p9428 = 1, or on change of status from p0009 = 101 to 0 or 111.

Description:
If, when comparing the actual topology and target topology, only error has occurred, that can be acknowledged, then using this parameter, a new comparison can be started - acknowledging the error in the target topology.

Differences that can be acknowledged:
- topology comparison, component shifted
- topology comparison, serial number of a component has been detected to be different (byte 3 = 1)
- topology comparison shows one component that is connected differently

The following parameter values are available:
p9904 = 1 --> the procedure is started.
p9904 = 0 after starting --> the procedure has been successfully completed.
p9904 = 1 after starting --> the procedure has not been successfully completed.
The possible causes for an unsuccessful procedure are located in bytes 4, 3, 2.

Byte 2:
Number of structural differences.

Byte 3:
Number of differences that can be acknowledged (p9904).

Byte 4:
Number of differences. These differences can be resolved as follows:
- sets the topology comparison (p9906 or p9907/p9908).
- change over the actual topology.

The appropriate action should be selected corresponding to the message that is displayed/output.

Note:
In order to permanently accept the acknowledgement of the fault that can be resolved, then it must be saved in a non-volatile fashion (p0977).
**Parameter**

**List of parameters**

### p9905
**Device specialization / Specialization**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>p9905</td>
<td>1</td>
<td>With p9905 = 1, the serial numbers and the hardware versions of all of the components are transferred from the actual topology into the target topology and a new comparison is started. For this device specialization, the components of the target topology may only differ from those of the actual topology by the serial numbers.</td>
</tr>
<tr>
<td>p9905</td>
<td>2</td>
<td>With p9905 = 2, the serial numbers, the hardware versions and the order numbers of all of the components are transferred from the actual topology into the target topology and a new comparison is started. For this device specialization, the components of the target topology may only differ from those of the actual topology by the serial numbers and order numbers.</td>
</tr>
<tr>
<td>p9905</td>
<td>0</td>
<td>p9905 is automatically set to 0 at the end of the operation. In order to permanently accept the data, it is necessary to save in a non-volatile fashion (p0977).</td>
</tr>
</tbody>
</table>

### p9910
**Transfer additional components into the target topology / Transfer comp**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>p9910</td>
<td>0</td>
<td>No selection</td>
</tr>
<tr>
<td>p9910</td>
<td>1</td>
<td>Drive object type SERVO</td>
</tr>
<tr>
<td>p9910</td>
<td>2</td>
<td>Drive object type VECTOR</td>
</tr>
<tr>
<td>p9910</td>
<td>3</td>
<td>SINAMICS GM (DFEMV &amp; VECTORMV)</td>
</tr>
<tr>
<td>p9910</td>
<td>4</td>
<td>SINAMICS SM (AFEMV &amp; VECTORMV)</td>
</tr>
<tr>
<td>p9910</td>
<td>5</td>
<td>SINAMICS GL (VECTORGL)</td>
</tr>
<tr>
<td>p9910</td>
<td>6</td>
<td>SINAMICS SL (VECTORSL)</td>
</tr>
</tbody>
</table>

### p9915
**DRIVE-CLiQ data transfer error shutdown threshold master / DLQ fault master**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>p9915</td>
<td>0</td>
<td>Not for motor type</td>
</tr>
<tr>
<td>p9915</td>
<td>1</td>
<td>Expert list</td>
</tr>
</tbody>
</table>

### p9916
**DRIVE-CLiQ data transfer error shutdown threshold slave / DLQ fault slave**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>p9916</td>
<td>0</td>
<td>Not for motor type</td>
</tr>
<tr>
<td>p9916</td>
<td>1</td>
<td>Expert list</td>
</tr>
</tbody>
</table>

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### Description:
Enters the license key for this drive unit.

Example of the license key:
EACZ-QBCA = 69 65 67 90 45 81 66 67 65 dec (ASCII characters)

Index 0 = license key character 1 (e.g. 69 dec)
Index 1 = license key character 2 (e.g. 65 dec)
...
Index 8 = license key character 9 (e.g. 65 dec)
Index 9 = license key character 20 (e.g. 0 dec)
...

With the STARTER commissioning software, ASCII characters are not entered coded, i.e. the characters of the license key can be entered as printed in the Certificate of License. In this case, STARTER codes the characters.

### Dependency:
Refer to: r7843, p9921
Refer to: A13000, A13001, F13010

### Notice:
An ASCII table (excerpt) can be found, for example, in the appendix to the List Manual.

### Note:
If there is not a valid license key present, all the indices have the value 0 dec.

Only the ASCII characters, contained in a license key can be entered.

When changing p9920[x] to the value 0 dec, all the values of all the following indices are also set to 0 dec.

After entering the license key, the license key must be activated (p9921).

If the licensing is not adequate, then the following alarm is displayed together with LED:
- A13000 --> licensing not sufficient
- LED READY --> flashes green/red with 0.5 Hz

### p9920
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p9920[0...99]</td>
<td>Licensing, enter license key / Enter license key</td>
<td>Can be changed: U, T</td>
<td>Calculated: -</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Data type: Unsigned8</td>
<td>Dynamic index: -</td>
</tr>
<tr>
<td></td>
<td></td>
<td>P-Group: -</td>
<td>Units group: -</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0</td>
</tr>
</tbody>
</table>

### p9921
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p9921</td>
<td>Licensing, activate license key / Act license key</td>
<td>Can be changed: U, T</td>
<td>Calculated: -</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Data type: Integer16</td>
<td>Dynamic index: -</td>
</tr>
<tr>
<td></td>
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<td>P-Group: -</td>
<td>Units group: -</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0</td>
</tr>
</tbody>
</table>

### Value:
0: Inactive
1: Activate start license key

### Dependency:
Refer to: p9920
Refer to: A13000, A13001, F13010

### Note:
Before activation, the license key entered using parameter p9920 is checked. If this check identifies an error, activation is rejected. In this case, writing a 1 to p9921 is rejected.

When the license key has been activated, p9921 is automatically set to 0.
### r9925[0...99] Firmware file incorrect / FW file incorr

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CU_S110-CAN, CU_S110-DP, CU_S110-PN</strong></td>
<td>Displays the directory and name of the file whose status as shipped from the factory was identified as impermissible.</td>
</tr>
</tbody>
</table>

**Dependency:**
- Refer to: r9926
- Refer to: A01016

**Note:**
- The directory and name of the file is displayed in the ASCII code.

### r9926 Firmware check status / FW check status

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CU_S110-CAN, CU_S110-DP, CU_S110-PN</strong></td>
<td>Displays the status when the firmware is checked when the system is booted.</td>
</tr>
</tbody>
</table>

0: Firmware not yet checked.
1: Check running.
2: Check successfully completed.
3: Check indicates an error.

**Dependency:**
- Refer to: r9925
- Refer to: A01016

### p9930[0...8] System logbook activation / SYSLOG activation

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CU_S110-CAN, CU_S110-DP, CU_S110-PN</strong></td>
<td>Only for service purposes.</td>
</tr>
</tbody>
</table>

**Index:**
- [0] = System logbook stage (0: Not active)
- [1] = COM2/COM1 (0: COM2, 1: COM1)
- [2] = Activate file write (0: Not active)
- [3] = Display time stamp (0: Not displayed)
- [4] = Reserved
- [5] = Reserved
- [6] = Reserved
- [7] = Reserved
- [8] = System logbook file size (stages, each 10 kB)

**Notice:**
- Before powering down the Control Unit, ensure that the system logbook is switched out (p9930[0] = 0).
- If writing to the file is activated (p9930[2] = 1), writing to the file must be de-activated again before switching off the Control Unit (p9930[2] = 0) in order to ensure that the system logbook has been completely written to the file.
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Index</th>
<th>Dependency</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p9931[0...129]</td>
<td>System logbook module selection / SYSLOG mod select.</td>
<td>Only for service purposes.</td>
<td>Refer to: r9976, r9979, r9980, r9981</td>
<td>Re index 3 ... 5: The total utilizations are determined using all sampling times used. The largest total utilizations are mapped here. The sampling time with the largest total utilization is displayed in r9979. Total utilization: Computing time load of sampling time involved including load from higher-priority sampling times (interrupts).</td>
</tr>
<tr>
<td>p9932</td>
<td>Save system logbook EEPROM / SYSLOG EEPROM save</td>
<td>Only for service purposes.</td>
<td>Refer to: F01054, F01205</td>
<td></td>
</tr>
<tr>
<td>r9975[0...7]</td>
<td>System utilization measured / Sys util meas</td>
<td>Displays the measured system utilization. The higher the value displayed, the higher the system utilization.</td>
<td>Refer to: r9976, r9979, r9980, r9981</td>
<td></td>
</tr>
<tr>
<td>r9976[0...7]</td>
<td>System utilization / Sys util</td>
<td>Displays the system utilization. If the utilization is greater than 100%, fault F01054 is output.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Parameter**

**List of parameters**

**Index:**

- [0] = Reserved
- [1] = Computing time utilization
- [2] = Reserved
- [3] = Reserved
- [4] = Reserved
- [5] = Largest total utilization
- [6] = Reserved
- [7] = Reserved

**Dependency:**

Refer to: r9979, r9980

Refer to: F01054, F01205

**Note:**

Re index 1:
The value shows the total computing time load of the system.

Re index 5:
The total utilization is determined using all sampling times used. The largest total utilization is mapped here. The sampling time with the largest total utilization is displayed in r9979.

**Total utilization:**

Computing time load of sampling time involved including load from higher-priority sampling times (interrupts).

**r9979 Sampling time with largest total utilization / t_sampl lg total**

**CU_S110-CAN, CU_S110-DP, CU_S110-PN**

Can be changed: -

Data type: FloatingPoint32

P-Group: -

Not for motor type: -

Min - [µs]

Max - [µs]

**Calculated: -**

Dynamic index: -

Units group: -

Scaling: -

Expert list: 1

Access level: 3

Units group: -

Unit selection: -

Factory setting

**Description:**

Displays the sampling time with the largest total utilization.

**Dependency:**

Refer to: r7901, r9976

Refer to: F01054

**Note:**

The largest total utilization is displayed in r9976[5].

**Total utilization:**

Computing time load of sampling time involved including load from higher-priority sampling times (interrupts).

**r9980[0...101] Sampling times utilization calculated / t_sampl util calc**

**CU_S110-CAN, CU_S110-DP, CU_S110-PN**

Can be changed: -

Data type: FloatingPoint32

P-Group: -

Not for motor type: -

Min - [%]

Max - [%]

**Calculated: -**

Dynamic index: -

Units group: -

Scaling: -

Expert list: 1

Access level: 4

Units group: -

Unit selection: -

Factory setting

**Description:**

Displays the calculated utilizations for the active sampling times based on the existing target topology.

**Index:**

- [0] = Net utilization 0
- [1] = Total utilization 0
- [2] = Net utilization 1
- [3] = Total utilization 1
- [5] = Total utilization 2
- [6] = Net utilization 3
- [7] = Total utilization 3
- [8] = Net utilization 4
- [9] = Total utilization 4
- [10] = Net utilization 5
- [12] = Net utilization 6
- [13] = Total utilization 6
- [14] = Net utilization 7
- [15] = Total utilization 7
- [16] = Net utilization 8
List of parameters

[17] = Total utilization 8
[18] = Net utilization 9
[19] = Total utilization 9
[20] = Net utilization 10
[21] = Total utilization 10
[22] = Net utilization 11
[23] = Total utilization 11
[24] = Net utilization 12
[25] = Total utilization 12
[26] = Net utilization 13
[27] = Total utilization 13
[28] = Net utilization 14
[29] = Total utilization 14
[30] = Net utilization 15
[31] = Total utilization 15
[32] = Net utilization 16
[33] = Total utilization 16
[34] = Net utilization 17
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[37] = Total utilization 18
[38] = Net utilization 19
[39] = Total utilization 19
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[58] = Net utilization 29
[59] = Total utilization 29
[60] = Net utilization 30
[61] = Total utilization 30
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[63] = Total utilization 31
[64] = Net utilization 32
[65] = Total utilization 32
[66] = Net utilization 33
[67] = Total utilization 33
[68] = Net utilization 34
[69] = Total utilization 34
[70] = Net utilization 35
[71] = Total utilization 35
[72] = Net utilization 36
[73] = Total utilization 36
[74] = Net utilization 37
[75] = Total utilization 37
[76] = Net utilization 38
[77] = Total utilization 38
[78] = Net utilization 39
[79] = Total utilization 39
[80] = Net utilization 40
Parameter

List of parameters

<table>
<thead>
<tr>
<th>Index</th>
<th>Description</th>
<th>Access level</th>
</tr>
</thead>
<tbody>
<tr>
<td>[0]</td>
<td>= Net utilization 0</td>
<td></td>
</tr>
<tr>
<td>[1]</td>
<td>= Net utilization 1</td>
<td></td>
</tr>
<tr>
<td>[3]</td>
<td>= Net utilization 3</td>
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<tr>
<td>[4]</td>
<td>= Net utilization 4</td>
<td></td>
</tr>
<tr>
<td>[7]</td>
<td>= Net utilization 7</td>
<td></td>
</tr>
<tr>
<td>[8]</td>
<td>= Net utilization 8</td>
<td></td>
</tr>
<tr>
<td>[9]</td>
<td>= Net utilization 9</td>
<td></td>
</tr>
<tr>
<td>[10]</td>
<td>= Total utilization 6</td>
<td></td>
</tr>
<tr>
<td>[12]</td>
<td>= Total utilization 8</td>
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<tr>
<td>[14]</td>
<td>= Net utilization 10</td>
<td></td>
</tr>
<tr>
<td>[15]</td>
<td>= Total utilization 10</td>
<td></td>
</tr>
</tbody>
</table>

Dependency:
Refer to: r7901, r9976, r9979
Refer to: F01054

Note:
The corresponding sampling times can be read out in parameter r7901.
Net utilization:
Computing time load that is only called by the sampling time involved.
Total utilization:
Computing time load of sampling time involved including load from higher-priority sampling times (interrupts).

r9981[0...101] Sampling times utilization measured / \textit{t\_sampl\_util\_meas}

CU_S110-CAN, CU_S110-DP, CU_S110-PN

<table>
<thead>
<tr>
<th>Index</th>
<th>Description</th>
<th>Access level</th>
</tr>
</thead>
<tbody>
<tr>
<td>[0]</td>
<td>= Net utilization 0</td>
<td></td>
</tr>
<tr>
<td>[1]</td>
<td>= Net utilization 1</td>
<td></td>
</tr>
<tr>
<td>[3]</td>
<td>= Net utilization 3</td>
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<tr>
<td>[7]</td>
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<td></td>
</tr>
<tr>
<td>[8]</td>
<td>= Net utilization 8</td>
<td></td>
</tr>
<tr>
<td>[9]</td>
<td>= Net utilization 9</td>
<td></td>
</tr>
<tr>
<td>[10]</td>
<td>= Total utilization 6</td>
<td></td>
</tr>
<tr>
<td>[12]</td>
<td>= Total utilization 8</td>
<td></td>
</tr>
</tbody>
</table>

Dependency:
Refer to: r7901, r9976, r9979
Refer to: F01054

Note:
The corresponding sampling times can be read out in parameter r7901.
Net utilization:
Computing time load that is only called by the sampling time involved.
Total utilization:
Computing time load of sampling time involved including load from higher-priority sampling times (interrupts).

r9981[0...101] Sampling times utilization measured / \textit{t\_sampl\_util\_meas}

CU_S110-CAN, CU_S110-DP, CU_S110-PN

<table>
<thead>
<tr>
<th>Index</th>
<th>Description</th>
<th>Access level</th>
</tr>
</thead>
<tbody>
<tr>
<td>[0]</td>
<td>= Net utilization 0</td>
<td></td>
</tr>
<tr>
<td>[1]</td>
<td>= Net utilization 1</td>
<td></td>
</tr>
<tr>
<td>[3]</td>
<td>= Net utilization 3</td>
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<td>[7]</td>
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<td>[8]</td>
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<td>[9]</td>
<td>= Net utilization 9</td>
<td></td>
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<tr>
<td>[10]</td>
<td>= Total utilization 6</td>
<td></td>
</tr>
<tr>
<td>[12]</td>
<td>= Total utilization 8</td>
<td></td>
</tr>
</tbody>
</table>

Dependency:
Refer to: r7901, r9976, r9979
Refer to: F01054

Note:
The corresponding sampling times can be read out in parameter r7901.
Net utilization:
Computing time load that is only called by the sampling time involved.
Total utilization:
Computing time load of sampling time involved including load from higher-priority sampling times (interrupts).
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>[23]</td>
<td>Total utilization 11</td>
</tr>
<tr>
<td>[24]</td>
<td>Net utilization 12</td>
</tr>
<tr>
<td>[25]</td>
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<td>[27]</td>
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<td>[38]</td>
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<td>[39]</td>
<td>Total utilization 19</td>
</tr>
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<td>[40]</td>
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<td>[41]</td>
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<td>[42]</td>
<td>Net utilization 21</td>
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<tr>
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<td>Total utilization 41</td>
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<tr>
<td>[84]</td>
<td>Net utilization 42</td>
</tr>
<tr>
<td>[85]</td>
<td>Total utilization 42</td>
</tr>
<tr>
<td>[86]</td>
<td>Net utilization 43</td>
</tr>
</tbody>
</table>
Parameter
List of parameters

[87] = Total utilization 43
[88] = Net utilization 44
[89] = Total utilization 44
[90] = Net utilization 45
[91] = Total utilization 45
[92] = Net utilization 46
[93] = Total utilization 46
[94] = Net utilization 47
[95] = Total utilization 47
[96] = Net utilization 48
[97] = Total utilization 48
[98] = Net utilization 49
[99] = Total utilization 49
[100] = Net utilization 50
[101] = Total utilization 50

Dependency:
Refer to: r7901, r9975, r9980
Refer to: F01054

Note:
The corresponding sampling times can be read out in parameter r7901.
Net utilization:
Computing time load that is only called by the sampling time involved.
Total utilization:
Computing time load of sampling time involved including load from higher-priority sampling times (interrupts).

<table>
<thead>
<tr>
<th>r9982[0...4]</th>
<th>Data memory utilization / Mem_util dat_mem</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CU_S110-CAN, CU_S110-DP, CU_S110-PN</strong></td>
<td><strong>Can be changed:</strong> -</td>
</tr>
<tr>
<td><strong>Data type:</strong> FloatingPoint32</td>
<td><strong>Dynamic index:</strong> -</td>
</tr>
<tr>
<td><strong>P-Group:</strong> -</td>
<td><strong>Units group:</strong> -</td>
</tr>
<tr>
<td><strong>Not for motor type:</strong> -</td>
<td><strong>Scaling:</strong> -</td>
</tr>
<tr>
<td><strong>Min</strong></td>
<td><strong>Max</strong></td>
</tr>
<tr>
<td>- [%]</td>
<td>- [%]</td>
</tr>
</tbody>
</table>

Description:
Displays the calculated data memory utilization rates based on the existing target topology.

Index:
[0] = Fast Memory 1
[1] = Fast Memory 2
[3] = Fast Memory 4
[4] = Reserved

Dependency:
Refer to: F01068

<table>
<thead>
<tr>
<th>r9983[0...4]</th>
<th>Measured data memory utilization (actual load) / Mem_ut dat_mem ms</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CU_S110-CAN, CU_S110-DP, CU_S110-PN</strong></td>
<td><strong>Can be changed:</strong> -</td>
</tr>
<tr>
<td><strong>Data type:</strong> FloatingPoint32</td>
<td><strong>Dynamic index:</strong> -</td>
</tr>
<tr>
<td><strong>P-Group:</strong> -</td>
<td><strong>Units group:</strong> -</td>
</tr>
<tr>
<td><strong>Not for motor type:</strong> -</td>
<td><strong>Scaling:</strong> -</td>
</tr>
<tr>
<td><strong>Min</strong></td>
<td><strong>Max</strong></td>
</tr>
<tr>
<td>- [%]</td>
<td>- [%]</td>
</tr>
</tbody>
</table>

Description:
Displays the measured data memory utilization rates based on the existing target topology.

Index:
[0] = Fast Memory 1
[1] = Fast Memory 2
[3] = Fast Memory 4
[4] = Heap

Dependency:
Refer to: F01068
## List of parameters

### r9984[0...4] Data memory utilization OA / Mem_ut dat_mem OA

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CU_S110-CAN, CU_S110-DP, CU_S110-PN</strong></td>
<td>Can be changed: - Calculated: - Access level: 3</td>
</tr>
<tr>
<td><strong>Data type:</strong> FloatingPoint32</td>
<td>Dynamic index: - Func. diagram: -</td>
</tr>
<tr>
<td><strong>P-Group:</strong> -</td>
<td>Units group: - Unit selection: -</td>
</tr>
<tr>
<td><strong>Not for motor type:</strong> -</td>
<td>Scaling: - Expert list: 1</td>
</tr>
<tr>
<td><strong>Min</strong></td>
<td>Max</td>
</tr>
<tr>
<td>- [%]</td>
<td>- [%]</td>
</tr>
</tbody>
</table>

**Description:** Displays the utilization of the data memory by OA applications.

**Index:**
- [0] = Fast Memory 1
- [1] = Fast Memory 2
- [2] = Fast Memory 3
- [3] = Fast Memory 4
- [4] = Reserved

**Dependency:** Refer to: F01068

### r9986[0...7] DRIVE-CLiQ system load / DQ system load

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CU_S110-CAN, CU_S110-DP, CU_S110-PN</strong></td>
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<td><strong>Data type:</strong> FloatingPoint32</td>
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<tr>
<td><strong>P-Group:</strong> -</td>
<td>Units group: - Unit selection: -</td>
</tr>
<tr>
<td><strong>Not for motor type:</strong> -</td>
<td>Scaling: - Expert list: 1</td>
</tr>
<tr>
<td><strong>Min</strong></td>
<td>Max</td>
</tr>
<tr>
<td>- [%]</td>
<td>- [%]</td>
</tr>
</tbody>
</table>

**Description:** Displays the calculated DRIVE-CLiQ system load based on the existing target topology. The values are not made available until the RUNUP READY (800) state is adopted (see p3988).

**Index:** 0 ... 7 corresponds to DRIVE-CLiQ socket X100 ... X107.

### r9987[0...7] DRIVE-CLiQ bandwidth load / DQ bandw load

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CU_S110-CAN, CU_S110-DP, CU_S110-PN</strong></td>
<td>Can be changed: - Calculated: - Access level: 3</td>
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<td><strong>Data type:</strong> FloatingPoint32</td>
<td>Dynamic index: - Func. diagram: -</td>
</tr>
<tr>
<td><strong>P-Group:</strong> -</td>
<td>Units group: - Unit selection: -</td>
</tr>
<tr>
<td><strong>Not for motor type:</strong> -</td>
<td>Scaling: - Expert list: 1</td>
</tr>
<tr>
<td><strong>Min</strong></td>
<td>Max</td>
</tr>
<tr>
<td>- [%]</td>
<td>- [%]</td>
</tr>
</tbody>
</table>

**Description:** Displays the calculated DRIVE-CLiQ bandwidth load based on the existing target topology. The values are not made available until the RUNUP READY (800) state is adopted (see p3988).

**Index:** 0 ... 7 corresponds to DRIVE-CLiQ socket X100 ... X107.

### r9988[0...7] DRIVE-CLiQ DPRAM load / DQ DPRAM load

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CU_S110-CAN, CU_S110-DP, CU_S110-PN</strong></td>
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<td><strong>Data type:</strong> FloatingPoint32</td>
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<tr>
<td><strong>P-Group:</strong> -</td>
<td>Units group: - Unit selection: -</td>
</tr>
<tr>
<td><strong>Not for motor type:</strong> -</td>
<td>Scaling: - Expert list: 1</td>
</tr>
<tr>
<td><strong>Min</strong></td>
<td>Max</td>
</tr>
<tr>
<td>- [%]</td>
<td>- [%]</td>
</tr>
</tbody>
</table>

**Description:** Displays the calculated DRIVE-CLiQ DPRAM load based on the existing target topology. The values are not made available until the RUNUP READY (800) state is adopted (see p3988).

**Index:** 0 ... 7 corresponds to DRIVE-CLiQ socket X100 ... X107.
# Parameter

## List of parameters

### p9990  DO memory usage actual value determination selection / Mem_use ActVal sel

<p>| | | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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<td>Func. diagram:</td>
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<tr>
<td></td>
<td>P-Group:</td>
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<td>Units group:</td>
<td>-</td>
<td>Unit selection:</td>
<td>-</td>
<td></td>
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<tr>
<td></td>
<td>Not for motor type:</td>
<td>-</td>
<td>Scaling:</td>
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<td>Expert list:</td>
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<tr>
<td></td>
<td>Min</td>
<td>0</td>
<td>Max</td>
<td>65535</td>
<td>Factory setting</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

**Description:**
The meaning of the parameter differs for reading and writing.

**Read:**
- Returns the number of memory areas monitored.

**Write:**
- Memory usage of a drive object: Enter drive object number
- Memory usage of the complete system: Enter value 65535

### r9991[0...4]  Memory usage actual values per DO / Mem_use ActVal/DO

<p>| | | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
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<td></td>
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<td>Dynamic index:</td>
<td>-</td>
<td>Func. diagram:</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>P-Group:</td>
<td>-</td>
<td>Units group:</td>
<td>-</td>
<td>Unit selection:</td>
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</tr>
<tr>
<td></td>
<td>Not for motor type:</td>
<td>-</td>
<td>Scaling:</td>
<td>-</td>
<td>Expert list:</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Min</td>
<td>-</td>
<td>Max</td>
<td>-</td>
<td>Factory setting</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

**Index:**
[0] = Fast Memory 1
[1] = Fast Memory 2
[3] = Fast Memory 4
[4] = Heap

### r9992[0...4]  Memory usage setpoints per DO / Mem_use setp/DO

<p>| | | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
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<th></th>
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<tr>
<td></td>
<td>Data type:</td>
<td>Unsigned32</td>
<td>Dynamic index:</td>
<td>-</td>
<td>Func. diagram:</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>P-Group:</td>
<td>-</td>
<td>Units group:</td>
<td>-</td>
<td>Unit selection:</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not for motor type:</td>
<td>-</td>
<td>Scaling:</td>
<td>-</td>
<td>Expert list:</td>
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<td></td>
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<tr>
<td></td>
<td>Min</td>
<td>-</td>
<td>Max</td>
<td>-</td>
<td>Factory setting</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

**Index:**
[0] = Fast Memory 1
[1] = Fast Memory 2
[3] = Fast Memory 4
[4] = Heap

### r9993[0...4]  OA memory usage / Mem_use OA

<p>| | | | | | | | |</p>
<table>
<thead>
<tr>
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<th></th>
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</thead>
<tbody>
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<td>Can be changed:</td>
<td>-</td>
<td>Calculated:</td>
<td>-</td>
<td>Access level:</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Data type:</td>
<td>Unsigned32</td>
<td>Dynamic index:</td>
<td>-</td>
<td>Func. diagram:</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>P-Group:</td>
<td>-</td>
<td>Units group:</td>
<td>-</td>
<td>Unit selection:</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not for motor type:</td>
<td>-</td>
<td>Scaling:</td>
<td>-</td>
<td>Expert list:</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Min</td>
<td>-</td>
<td>Max</td>
<td>-</td>
<td>Factory setting</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

**Index:**
[0] = Fast Memory 1
[1] = Fast Memory 2
[3] = Fast Memory 4
[4] = Heap
### p10001 SI delay time for test stop at DO / SI t_delay DO

**Description:**
Sets the delay time for testing the digital output. Within this time, for a forced checking procedure of the digital output, the signal must have been detected via the corresponding readback input (p10047).

**Dependency:**
Refer to: p10003, p10007, p10017, p10046

**Note:**
The delay time must be set to a value greater than the debounce time (p10017). Regardless of p10001, the forced checking procedure will pause for at least two safety monitoring clock cycles between each stage of the test. The test stop is only performed if the safety output is being used (see p10042).

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p10001</td>
<td>SI delay time for test stop at DO / SI t_delay DO</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>4.00 [ms]</td>
<td>500.00 [ms]</td>
</tr>
<tr>
<td>Max</td>
<td>2000.00 [ms]</td>
<td></td>
</tr>
</tbody>
</table>

### p10002 SI discrepancy monitoring time / SI discrep t_monit

**Description:**
Sets the monitoring time for the discrepancy for the digital inputs. The signal states at the two associated digital inputs (F-DI) must assume the same state within this monitoring time.

**Dependency:**
Refer to: p10102

**Note:**
F-DI: Failsafe Digital Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p10002</td>
<td>SI discrepancy monitoring time / SI discrep t_monit</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>1.00 [ms]</td>
<td>500.00 [ms]</td>
</tr>
<tr>
<td>Max</td>
<td>2000.00 [ms]</td>
<td></td>
</tr>
</tbody>
</table>

### p10003 SI forced checking procedure timer / SI FrcdCkProcTimer

**Description:**
Sets the time to carry out the forced checking procedure (test stop). Within the parameterized time, the digital inputs/outputs must must have been subject to a forced checking procedure at least once. The forced checking procedure is started with BI: p10007 = 0/1 signal.

**Dependency:**
Refer to: p10002, p10007, p10046

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p10003</td>
<td>SI forced checking procedure timer / SI FrcdCkProcTimer</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>0.00 [h]</td>
<td>8.00 [h]</td>
</tr>
<tr>
<td>Max</td>
<td>8760.00 [h]</td>
<td></td>
</tr>
</tbody>
</table>

### p10006 SI acknowledgement internal event F-DI (processor 1) / SI ackn int evt P1

**Description:**
Select a safety-relevant digital input for the signal "acknowledge internal event" (internal fault). The falling edge at this input resets the status "internal event" in the drive.

**Value:**
- 0: Statically active
- 1: F-DI 0
- 2: F-DI 1
### List of parameters

#### p10007 BI: SI forced checking procedure F-DO signal source / SI frc_chF-DO s_sc

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</strong></td>
<td></td>
</tr>
<tr>
<td>Can be changed: C2(95)</td>
<td>Calculated: -</td>
</tr>
<tr>
<td>Data type: Unsigned32 / Binary</td>
<td>Dynamic index: -</td>
</tr>
<tr>
<td>P-Group: Safety Integrated</td>
<td>Units group: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Min</td>
<td>Scaling: -</td>
</tr>
<tr>
<td>Max</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td>0.00 [ms]</td>
<td>100.00 [ms]</td>
</tr>
<tr>
<td>0.00 [ms]</td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Selects an input terminal to start the test stop. The test stop is started with a 0/1 signal at the input terminal and is then only possible if the drive is not in commissioning mode.

**Dependency:** Refer to: p10001, p10002, p10003, p10040, p10046

#### p10017 SI digital inputs debounce time (processor 1) / SI DI t_debounceP1

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</strong></td>
<td></td>
</tr>
<tr>
<td>Can be changed: C2(95)</td>
<td>Calculated: -</td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td>Dynamic index: -</td>
</tr>
<tr>
<td>P-Group: Safety Integrated</td>
<td>Units group: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Min</td>
<td>Scaling: -</td>
</tr>
<tr>
<td>Max</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td>0.00 [ms]</td>
<td>100.00 [ms]</td>
</tr>
<tr>
<td>0.00 [ms]</td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Sets the debounce time for digital inputs. The debounce time is accepted rounded off to whole milliseconds. The debounce time acts on the following digital inputs:
- Fail-safe digital inputs (F-DI).
- Single-channel digital inputs (DI).
- Single-channel digital input 22 (DI 22, read back input for the forced checking procedure).

**Dependency:** Refer to: p10117

**Note:** Example:
Debounce time = 1 ms: Fault pulses of 1 ms are filtered; only pulses longer than 2 ms are processed.
Debounce time = 3 ms: Fault pulses of 3 ms are filtered; only pulses longer than 4 ms are processed.
The debounce result can be read in r10051.

#### p10022 SI STO input terminal (processor 1) / SI STO F-DI P1

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</strong></td>
<td></td>
</tr>
<tr>
<td>Can be changed: C2(95)</td>
<td>Calculated: -</td>
</tr>
<tr>
<td>Data type: Integer16</td>
<td>Dynamic index: -</td>
</tr>
<tr>
<td>P-Group: Safety Integrated</td>
<td>Units group: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Unit selection: -</td>
</tr>
<tr>
<td>Min</td>
<td>Scaling: -</td>
</tr>
<tr>
<td>Max</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>255</td>
</tr>
</tbody>
</table>

**Description:** Sets the fail-safe digital input (F-DI) for the "STO" function.

**Value:**
- 0: Statically active
- 1: F-DI 0
- 2: F-DI 1
- 3: F-DI 2
- 255: Statically inact

**Dependency:** Refer to: p10122
### p10023  SI SS1 input terminal (processor 1) / SI SS1 F-DI P1

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

**Description:**
Sets the fail-safe digital input (F-DI) for the "SS1" function.

**Value:**
- 0: Statically active
- 1: F-DI 0
- 2: F-DI 1
- 3: F-DI 2
- 255: Statically inactive

**Dependency:**
Refer to: p10123

**Note:**
- If value = 0: No terminal assigned, safety function always active.
- If value = 255: No terminal assigned, safety function always inactive.

### p10024  SI SS2 input terminal (processor 1) / SI SS2 F-DI P1

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

**Description:**
Sets the fail-safe digital input (F-DI) for the "SS2" function.

**Value:**
- 0: Statically active
- 1: F-DI 0
- 2: F-DI 1
- 3: F-DI 2
- 255: Statically inactive

**Note:**
- If value = 0: No terminal assigned, safety function always active.
- If value = 255: No terminal assigned, safety function always inactive.
### p10025 SI SOS input terminal (processor 1) / SI SOS F-DI P1

**Data type:** Integer16  
**P-Group:** Safety Integrated  
**Not for motor type:** -  
**Min:** 0  
**Max:** 255  
**Description:** Sets the fail-safe digital input (F-DI) for the "SOS" function.  
**Value:**  
- 0: Statically active  
- 1: F-DI 0  
- 2: F-DI 1  
- 3: F-DI 2  
- 255: Statically inact  
**Note:**  
- If value = 0: No terminal assigned, safety function always active.  
- If value = 255: No terminal assigned, safety function always inactive.  

### p10026 SI SLS input terminal (processor 1) / SI SLS F-DI P1

**Data type:** Integer16  
**P-Group:** Safety Integrated  
**Not for motor type:** -  
**Min:** 0  
**Max:** 255  
**Description:** Sets the fail-safe digital input (F-DI) for the "SLS" function.  
**Value:**  
- 0: Statically active  
- 1: F-DI 0  
- 2: F-DI 1  
- 3: F-DI 2  
- 255: Statically inact  
**Dependency:** Refer to: p10126  
**Note:**  
- If value = 0: No terminal assigned, safety function always active.  
- If value = 255: No terminal assigned, safety function always inactive.  

### p10027 SI SLS limit bit 0 input terminal (processor 1) / SI SLS lim 0 DI P1

**Data type:** Integer16  
**P-Group:** Safety Integrated  
**Not for motor type:** -  
**Min:** 0  
**Max:** 255  
**Description:** Sets the fail-safe digital input (F-DI) for the limit value bit 0 of the "SLS" function.  
**Value:**  
- 0: Statically active  
- 1: F-DI 0  
- 2: F-DI 1  
- 3: F-DI 2  
- 255: Statically inact
### p10028  SI SLS limit bit 1 input terminal (processor 1) / SI SLS lim 1 DI P1

| Description: | Sets the fail-safe digital input (F-DI) for the limit value bit 1 of the "SLS" function. |
| Value: | 0: Statically active  
1: F-DI 0  
2: F-DI 1  
3: F-DI 2  
255: Statically inactive |
| Note: | If value = 0:  
No terminal assigned, selection bit remains statically at "0".  
If value = 255:  
No terminal assigned, selection bit remains statically at "1". |

### p10030  SI SDI positive input terminal (processor 1) / SI SDI pos F-DI P1

| Description: | Sets the fail-safe digital input (F-DI) for the "SDI positive" function. |
| Value: | 0: Statically active  
1: F-DI 0  
2: F-DI 1  
3: F-DI 2  
255: Statically inactive |
| Note: | If value = 0:  
No terminal assigned, safety function always active.  
If value = 255:  
No terminal assigned, safety function always inactive. |

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SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3

1-629
### p10031  SI SDI negative input terminal (processor 1) / SI SDI neg F-DI P1

<table>
<thead>
<tr>
<th>Data type: Integer16</th>
<th>P-Group: Safety Integrated</th>
<th>Not for motor type:</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed: C2(95)</td>
<td>Calculated: -</td>
<td>Dynamic index: -</td>
<td>0</td>
<td>255</td>
<td>0</td>
</tr>
<tr>
<td>SDI: Safe Direction (safe motion direction)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:**
Sets the fail-safe digital input (F-DI) for the "SDI negative" function.

**Value:**
- 0: Statically active
- 1: F-DI 0
- 2: F-DI 1
- 3: F-DI 2
- 255: Statically inact

**Note:**
- If value = 0: No terminal assigned, safety function always active.
- If value = 255: No terminal assigned, safety function always inactive.

### p10039  SI Safe State signal selection / SI Safe State Sel

<table>
<thead>
<tr>
<th>Data type: Unsigned32</th>
<th>P-Group: Safety Integrated</th>
<th>Not for motor type:</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed: C2(95)</td>
<td>Calculated: -</td>
<td>Dynamic index: -</td>
<td>-</td>
<td>-</td>
<td>0000 0001 bin</td>
</tr>
<tr>
<td>SDI: Safe Direction (safe motion direction)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:**
Sets the signals for the drive group specific signal "Safe State".

**Bit field:**

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Power_removed</td>
<td>Selected</td>
<td>Not selected</td>
<td>-</td>
</tr>
<tr>
<td>01</td>
<td>SS1_active</td>
<td>Selected</td>
<td>Not selected</td>
<td>-</td>
</tr>
<tr>
<td>02</td>
<td>SS2_active</td>
<td>Selected</td>
<td>Not selected</td>
<td>-</td>
</tr>
<tr>
<td>03</td>
<td>SOS_active</td>
<td>Selected</td>
<td>Not selected</td>
<td>-</td>
</tr>
<tr>
<td>04</td>
<td>SLS_active</td>
<td>Selected</td>
<td>Not selected</td>
<td>-</td>
</tr>
<tr>
<td>05</td>
<td>SDI_pos_active</td>
<td>Selected</td>
<td>Not selected</td>
<td>-</td>
</tr>
<tr>
<td>06</td>
<td>SDI_neg_active</td>
<td>Selected</td>
<td>Not selected</td>
<td>-</td>
</tr>
</tbody>
</table>

**Note:**
- Bit = 0 signal -> not selected
- Bit = 1 signal -> selected
The selected signals (high-active) are OR'ed The result of the logic operation results in the status "Safe State".
### Parameter p10040
**SI F-DI input mode / SI F-DI inp_mode**

**Description:**
Sets the input mode for the safety digital inputs (F-DI).

**Bit field:**
- | Bit | Signal name | 1 signal | 0 signal | FP |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>F-DI 1 (X130.2)</td>
<td>NO contact</td>
<td>NC contact</td>
<td>2850</td>
</tr>
<tr>
<td>01</td>
<td>F-DI 2 (X130.5)</td>
<td>NO contact</td>
<td>NC contact</td>
<td>2850</td>
</tr>
<tr>
<td>02</td>
<td>F-DI 3 (X131.2)</td>
<td>NO contact</td>
<td>NC contact</td>
<td>2850</td>
</tr>
</tbody>
</table>

**Note:**
Only an NC contact can be connected for the safety digital inputs not listed.

### Parameter p10042[0...5]
**SI F-DO 0 signal sources / SI F-DO 0 S_src**

**Description:**
Sets the signal sources for F-DO 0 (X131.5). The 6 signal sources in p10042[0...5] are AND'ed and the result is output at F-DO 0.

**Value:**
- | 0 | No function |
- | 1 | STO active |
- | 2 | SS1 active |
- | 3 | SS2 active |
- | 4 | SOS active |
- | 5 | SLS active |
- | 6 | SSM feedback signal active |
- | 7 | Safe state |
- | 8 | SOS selected |
- | 9 | Internal event |
- | 10 | Active SLS stage bit 0 |
- | 11 | Active SLS stage bit 1 |
- | 12 | SDI positive active |
- | 13 | SDI negative active |

**Index:**
- \([0] = \text{AND logic operation input 1}\)
- \([1] = \text{AND logic operation input 2}\)
- \([2] = \text{AND logic operation input 3}\)
- \([3] = \text{AND logic operation input 4}\)
- \([4] = \text{AND logic operation input 5}\)
- \([5] = \text{AND logic operation input 6}\)

**Note:**
F-DO: Failsafe Digital Output

### Parameter p10046
**SI F-DO feedback signal input activation / SI F-DO FS act**

**Description:**
Activates the readback input for the safety digital output (F-DO)
The test mode for the particular safety digital output is set in p10047.
### p10047 SI F-DO test stop mode / SI F-DO test mode

<table>
<thead>
<tr>
<th>Bit field:</th>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Test F-DO 0</td>
<td>Test active</td>
<td>No test</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

**Dependency:** Refer to: p10001, p10003, p10007, p10047

**Note:** The test stop is only performed if the safety output of the Control Unit is being used (see p10042).

### r10049 SI F-DI monitoring status (processor 1) / SI F-DI status P1

<table>
<thead>
<tr>
<th>Bit field:</th>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>F-DI 0</td>
<td>Safety monitored</td>
<td>Freely available</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>01</td>
<td>F-DI 1</td>
<td>Safety monitored</td>
<td>Freely available</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>02</td>
<td>F-DI 2</td>
<td>Safety monitored</td>
<td>Freely available</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

**Dependency:** p10006 / p10106, p10022 / p10122, p10023 / p10123, p10024 / p10124, p10025 / p10125, p10026 / p10126, p10027 / p10127, p10028 / p10128, p10030 / p10130, p10031 / p10131, p10036 / p10136, p10050 / p10150

**Refer to:** r10149

**Description:** Displays the monitoring status of the fail-safe digital inputs (F-DI). The F-DIs that are being used by the Safety Integrated functions are displayed. If the module used has fewer than 3 F-DIs, "Freely available" is displayed for the F-DIs which are not in use.

### Bit field: Bit Signal name 1 signal 0 signal FP
| 00 | Test F-DO 0 | Test active | No test | - |
| 01 | F-DI 0 | Safety monitored | Freely available | - |
| 02 | F-DI 1 | Safety monitored | Freely available | - |

**Dependency:** p10006 / p10106, p10022 / p10122, p10023 / p10123, p10024 / p10124, p10025 / p10125, p10026 / p10126, p10027 / p10127, p10028 / p10128, p10030 / p10130, p10031 / p10131, p10036 / p10136, p10050 / p10150

**Refer to:** r10149
### r10051.0...2  CO/BO: SI digital inputs status (processor 1) / SI DI status P1

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

- **Data type:** Unsigned32
- **Units group:** -
- **Expert list:** 1
- **Access level:** 3

**Description:**
Displays the single-channel debounced status of the digital inputs DI 16, DI 18, and DI 20.

**Dependency:**
Refer to: p9501, p9601, p10017, p10040, r10151

**Note:**
If a safety function is assigned to an input (e.g. via p10022), then the following applies:
- logical "0": Safety function is selected
- logical "1": Safety function is de-selected

The interrelationship between the logical level and the external voltage level at the input depends on the parameterization (refer to p10040) of the input as either NC or NO contact and is aligned to the use of a safety function:
- With 24 V at the input, NC contacts have a logical "1" level, for 0 V at the input, a logical "0" level.
- With 24 V at the input, NO contacts have a logical "0" level, for 0 V at the input, a logical "1" level.

**F-DI:** Failsafe Digital Input
The state of parameter r10151 is delayed by one monitoring clock cycle in relation to r10051.
The parameter is only updated in the following cases:
- If the Safety Extended Functions are enabled by means of activation via F-DI.
- If transfer of the F-DIs via PROFIsafe is enabled (see p9501).

In this case only the F-DIs transferred for PROFIsafe are displayed and updated (see p10050/p10150). All F-DIs which have not been transferred have a static zero value.

### r10052.0  CO/BO: SI digital outputs status (processor 1) / SI DO status P1

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

- **Data type:** Unsigned32
- **Units group:** -
- **Expert list:** 1
- **Access level:** 3

**Description:**
Displays the status of digital output DO 16+ (X131.5) from processor 1.

**Bit field:**

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>F-DI 0 CU</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>01</td>
<td>F-DI 1 CU</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>02</td>
<td>F-DI 2 CU</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
</tbody>
</table>

**Dependency:**
Refer to: p9501, p9601, p10017, p10040, r10151

**Note:**
If a safety function is assigned to an output (e.g. via p10022), then the following applies:
- logical "0": Safety function is selected
- logical "1": Safety function is de-selected

**p10101  SI delay time for test stop at DO / SI t_delay DO**

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

- **Data type:** FloatingPoint32
- **Units group:** -
- **Expert list:** 1
- **Access level:** 3

**Description:**
Sets the delay time for testing the digital output.
Within this time, for a forced checking procedure of the digital output, the signal must have been detected via the corresponding readback input (p10047).

**Dependency:**
Refer to: p10003, p10007, p10046

**Note:**
The delay time must be set to a value greater than the debounce time (p10017).
Regardless of p10001, the forced checking procedure will pause for at least two safety monitoring clock cycles between each stage of the test.
The test stop is only performed if the safety output is being used (p10142).

### p10102  
**SI discrepancy monitoring time (processor 2) / SI discr t_mon P2**

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

**Can be changed:** C2(95)
**Calculated:** -
**Access level:** 3

**Data type:** FloatingPoint32
**Dynamic index:** -
**Func. diagram:** 2850, 2851

**P-Group:** Safety Integrated
**Units group:** -
**Unit selection:** -

**Not for motor type:** -
**Scaling:** -
**Expert list:** 1

**Min**
1.00 [ms]
2000.00 [ms]

**Max**
500.00 [ms]

**Description:**
Sets the monitoring time for the discrepancy for the digital inputs.
The signal states at the two associated digital inputs (F-DI) must assume the same state within this monitoring time.

**Dependency:**
Refer to: p10002

**Note:**
F-DI: Failsafe Digital Input

### p10106  
**SI acknowledgement internal event F-DI (processor 2) / SI ackn int evt P2**

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

**Can be changed:** C2(95)
**Calculated:** -
**Access level:** 3

**Data type:** Integer16
**Dynamic index:** -
**Func. diagram:** -

**P-Group:** Safety Integrated
**Units group:** -
**Unit selection:** -

**Not for motor type:** -
**Scaling:** -
**Expert list:** 1

**Min**
0
255

**Max**
0

**Description:**
Select a safety-relevant digital input for the signal "acknowledge internal event" (internal fault).
The falling edge at this input resets the status "internal event" in the drive.

**Value:**
0: Statically active
1: F-DI 0
2: F-DI 1
3: F-DI 2
255: Statically inact

**Dependency:**
Refer to: p10006

**Note:**
If value = 0:
No terminal assigned, acknowledge input has a static zero value.

### p10117  
**SI digital inputs debounce time (processor 2) / SI DI t_debounceP2**

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

**Can be changed:** C2(95)
**Calculated:** -
**Access level:** 3

**Data type:** FloatingPoint32
**Dynamic index:** -
**Func. diagram:** -

**P-Group:** Safety Integrated
**Units group:** -
**Unit selection:** -

**Not for motor type:** -
**Scaling:** -
**Expert list:** 1

**Min**
0.00 [ms]
100.00 [ms]

**Max**
0.00 [ms]

**Description:**
Sets the debounce time for digital inputs.
The debounce time acts on the following digital inputs:
- Fail-safe digital inputs (F-DI).
- Single-channel digital input 22 (DI 22, read back input for the forced checking procedure).
The debounce time is accepted rounded off to whole milliseconds.

**Dependency:**
Refer to: p10017
List of parameters

Note:
Example:
Debounce time = 1 ms: Fault pulses of 1 ms are filtered; only pulses longer than 2 ms are processed.
Debounce time = 3 ms: Fault pulses of 3 ms are filtered; only pulses longer than 4 ms are processed.
The debounce result can be read in r10151.

p10122  
SI STO input terminal (processor 2) / SI STO F-DI P2

SERVO_S110-CAN,  
SERVO_S110-DP,  
SERVO_S110-PN

Can be changed: C2(95)  
Data type: Integer16  
P-Group: Safety Integrated

Not for motor type: -

Min  
Max

0  
255

Value:
0:  Statically active  
1:  F-DI 0  
2:  F-DI 1  
3:  F-DI 2  
255:  Statically inact

Dependency:
Refer to: p10022

Note:
If value = 0:
No terminal assigned, safety function always active.
If value = 255:
No terminal assigned, safety function always inactive.

F-DI: Failsafe Digital Input  
STO: Safe Torque Off

p10123  
SI SS1 input terminal (processor 2) / SI SS1 F-DI P2

SERVO_S110-CAN,  
SERVO_S110-DP,  
SERVO_S110-PN

Can be changed: C2(95)  
Data type: Integer16  
P-Group: Safety Integrated

Not for motor type: -

Min  
Max

0  
255

Value:
0:  Statically active  
1:  F-DI 0  
2:  F-DI 1  
3:  F-DI 2  
255:  Statically inact

Dependency:
Refer to: p10023

Note:
If value = 0:
No terminal assigned, safety function always active.
If value = 255:
No terminal assigned, safety function always inactive.

F-DI: Failsafe Digital Input  
SS1: Safe Stop 1
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Note</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p10124</td>
<td><strong>SI SS2 input terminal (processor 2) / SI SS2 F-DI P2</strong></td>
<td>Sets the fail-safe digital input (F-DI) for the &quot;SS2&quot; function.</td>
<td>0: Statically active 1: F-DI 0 2: F-DI 1 3: F-DI 2 255: Statically inact</td>
<td>If value = 0: No terminal assigned, safety function always active. If value = 255: No terminal assigned, safety function always inactive.</td>
</tr>
<tr>
<td>p10125</td>
<td><strong>SI SOS input terminal (processor 2) / SI SOS F-DI P2</strong></td>
<td>Sets the fail-safe digital input (F-DI) for the &quot;SOS&quot; function.</td>
<td>0: Statically active 1: F-DI 0 2: F-DI 1 3: F-DI 2 255: Statically inact</td>
<td>If value = 0: No terminal assigned, safety function always active. If value = 255: No terminal assigned, safety function always inactive.</td>
</tr>
<tr>
<td>p10126</td>
<td><strong>SI SLS input terminal (processor 2) / SI SLS F-DI P2</strong></td>
<td>Sets the fail-safe digital input (F-DI) for the &quot;SLS&quot; function.</td>
<td>0: Statically active 1: F-DI 0 2: F-DI 1 3: F-DI 2 255: Statically inact</td>
<td>If value = 0: No terminal assigned, safety function always active. If value = 255: No terminal assigned, safety function always inactive.</td>
</tr>
</tbody>
</table>
**Note:**

If value = 0:
No terminal assigned, safety function always active.

If value = 255:
No terminal assigned, safety function always inactive.

**F-DI:** Failsafe Digital Input

**SLS:** Safely-Limited Speed

### p10127

**SI SLS limit bit 0 input terminal (processor 2) / SI SLS lim 0 DI P2**

**Can be changed:** C2(95)

**Data type:** Integer16

**P-Group:** Safety Integrated

**Not for motor type:** -

**Min**

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Statically active</td>
</tr>
<tr>
<td>1</td>
<td>F-DI 0</td>
</tr>
<tr>
<td>2</td>
<td>F-DI 1</td>
</tr>
<tr>
<td>3</td>
<td>F-DI 2</td>
</tr>
<tr>
<td>255</td>
<td>Statically inact</td>
</tr>
</tbody>
</table>

**Calculated:** -

**Dynamic index:** -

**Units group:** -

**Scaling:** -

**Expert list:** 1

**Factory setting**

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>255</td>
</tr>
</tbody>
</table>

**Description:**
Sets the fail-safe digital input (F-DI) for the limit value bit 0 of the "SLS" function.

**Value:**

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Statically active</td>
</tr>
<tr>
<td>1</td>
<td>F-DI 0</td>
</tr>
<tr>
<td>2</td>
<td>F-DI 1</td>
</tr>
<tr>
<td>3</td>
<td>F-DI 2</td>
</tr>
<tr>
<td>255</td>
<td>Statically inact</td>
</tr>
</tbody>
</table>

**Note:**

If value = 0:
No terminal assigned, selection bit remains statically at "0".
If value = 255:
No terminal assigned, selection bit remains statically at "1".

**F-DI:** Failsafe Digital Input

**SLS:** Safely-Limited Speed

### p10128

**SI SLS limit bit 1 input terminal (processor 2) / SI SLS lim 1 DI P2**

**Can be changed:** C2(95)

**Data type:** Integer16

**P-Group:** Safety Integrated

**Not for motor type:** -

**Min**

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Statically active</td>
</tr>
<tr>
<td>1</td>
<td>F-DI 0</td>
</tr>
<tr>
<td>2</td>
<td>F-DI 1</td>
</tr>
<tr>
<td>3</td>
<td>F-DI 2</td>
</tr>
<tr>
<td>255</td>
<td>Statically inact</td>
</tr>
</tbody>
</table>

**Calculated:** -

**Dynamic index:** -

**Units group:** -

**Scaling:** -

**Expert list:** 1

**Factory setting**

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>255</td>
</tr>
</tbody>
</table>

**Description:**
Sets the fail-safe digital input (F-DI) for the limit value bit 1 of the "SLS" function.

**Value:**

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Statically active</td>
</tr>
<tr>
<td>1</td>
<td>F-DI 0</td>
</tr>
<tr>
<td>2</td>
<td>F-DI 1</td>
</tr>
<tr>
<td>3</td>
<td>F-DI 2</td>
</tr>
<tr>
<td>255</td>
<td>Statically inact</td>
</tr>
</tbody>
</table>

**Note:**

If value = 0:
No terminal assigned, selection bit remains statically at "0".
If value = 255:
No terminal assigned, selection bit remains statically at "1".

**F-DI:** Failsafe Digital Input

**SLS:** Safely-Limited Speed
### p10130 SI SDI positive input terminal (processor 2) / SI SDI pos DI P2

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Note</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0:</td>
<td>Statically active</td>
<td>F-DI 0</td>
<td>No terminal assigned, safety function always active.</td>
<td></td>
</tr>
<tr>
<td>1:</td>
<td>F-DI 1</td>
<td>F-DI 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2:</td>
<td>F-DI 2</td>
<td>F-DI 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>255:</td>
<td>Statically inactive</td>
<td>No terminal assigned, safety function always inactive.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**F-DI**: Failsafe Digital Input  
**SDI**: Safe Direction (safe motion direction)

### p10131 SI SDI negative input terminal (processor 2) / SI SDI neg DI P2

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Note</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0:</td>
<td>Statically active</td>
<td>F-DI 0</td>
<td>No terminal assigned, safety function always active.</td>
<td></td>
</tr>
<tr>
<td>1:</td>
<td>F-DI 1</td>
<td>F-DI 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2:</td>
<td>F-DI 2</td>
<td>F-DI 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>255:</td>
<td>Statically inactive</td>
<td>No terminal assigned, safety function always inactive.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**F-DI**: Failsafe Digital Input  
**SDI**: Safe Direction (safe motion direction)

### p10139 SI Safe State signal selection (processor 2) / SI Safe State Sel

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Note</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bit 0 = Power_removed</td>
<td>Sets the signals for the drive group specific signal &quot;Safe State&quot;.</td>
<td></td>
<td></td>
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<tr>
<td>Bit 1 = SS1_active</td>
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<tr>
<td>Bit 2 = SS2_active</td>
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<td></td>
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<tr>
<td>Bit 3 = SOS_active</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Bit 4 = SLS_active</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

**Access level**: 3  
**Expert list**: 1  
**Unit selection**: -  
**Data type**: Unsigned32  
**Scaling**: -  
**Dynamic index**: -  
**Func. diagram**: 2856  
**Units group**: -  
**P-Group**: Safety Integrated
Bit 5 = SDI_pos_active
Bit 6 = SDI_neg_active

**Note:**
Bit = 0 signal --> not selected
Bit = 1 signal --> selected
The selected signals (high-active) are OR'ed The result of the logic operation results in the status "Safe State".

### p10140 SI F-DI input mode (processor 2) / SI F-DI mode P2

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

**Can be changed:** C2(95)
**Data type:** Unsigned32
**P-Group:** Safety Integrated
**Not for motor type:** -
**Min**
**Max**
**Factory setting**

**Description:**
Sets the input mode for the safety digital inputs (F-DI).

---

### p10142[0...5] SI F-DO 0 signal sources (processor 2) / SI F-DO 0 S_src P2

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

**Can be changed:** C2(95)
**Data type:** Integer16
**P-Group:** Safety Integrated
**Not for motor type:** -
**Min**
**Max**
**Factory setting**

**Description:**
Sets the signal sources for F-DO 0 (X131.6).
The 6 signal sources in p10142[0...5] are AND'ed and the result is output at F-DO 0.

**Value:**
0: No function
1: STO active
2: SS1 active
3: SS2 active
4: SOS active
5: SLS active
6: SSM feedback signal active
7: Safe state
8: SOS selected
9: Internal event
10: Active SLS stage bit 0
11: Active SLS stage bit 1
12: SDI positive active
13: SDI negative active

**Index:**
[0] = AND logic operation input 1
[1] = AND logic operation input 2
[2] = AND logic operation input 3
[3] = AND logic operation input 4
[4] = AND logic operation input 5
[5] = AND logic operation input 6
Parameter
List of parameters

Note:
F-DO: Failsafe Digital Output

p10146  SI test sensor feedback signal / SI test sens FS
SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Data type: Unsigned32
P-Group: Safety Integrated
Not for motor type: -
Min Max Factory setting
0000 bin
Description: Sets the test of the feedback line for forced checking procedure.
Bit field: Bit Signal name 1 signal 0 signal FP
00 Test F-DO 0 Test active No test -

Note:
F-DO: Failsafe Digital Output

p10147  SI F-DO test stop mode / SI F-DO test mode
SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Data type: Integer16
P-Group: Safety Integrated
Not for motor type: -
Min Max Factory setting
0001 bin 0011 bin 0010 bin
Description: Sets the test stop mode for the safety digital output (F-DO)
Value:
1: Test mode 1 evaluation of int. diagnostic signal (passive load)
2: Test mode 2 read back F-DO in DI (relay circuit)
3: Test mode 3 read back F-DO in DI (actuator with feedback signal)
Dependency:
Refer to: p10001, p10003, p10046

p10149  SI F-DI monitoring status (processor 2) / SI F-DI status P2
SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Data type: Unsigned32
P-Group: Safety Integrated
Not for motor type: -
Min Max Factory setting
- -
Description: Displays the monitoring status of the fail-safe digital inputs (F-DI).
The F-DIs that are being used by the Safety Integrated functions are displayed.
If the module used has fewer than 3 F-DIs, "Freely available" is displayed for the F-DIs which are not in use.
Bit field: Bit Signal name 1 signal 0 signal FP
00 F-DI 0 Safety monitored Freely available -
01 F-DI 1 Safety monitored Freely available -
02 F-DI 2 Safety monitored Freely available -
Dependency:
p10006 / p10106
p10022 / p10122
p10023 / p10123
p10024 / p10124
p10025 / p10125
p10026 / p10126
p10027 / p10127
p10028 / p10128
p10030 / p10130
p10031 / p10131
p10036 / p10136
p10050 / p10150
Refer to: r10049

**r10151.0...2**

**CO/BO: SI digital inputs status (processor 2) / SI DI status P2**

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

<table>
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<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
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</table>

**Data type:** Unsigned32  
**Dynamic index:** -  
**Func. diagram:** -  
**Units group:** -  
**Unit selection:** -  
**Not for motor type:** -  
**Scaling:** -  
**Expert list:** 1  
**Min** | **Max** | **Factory setting** |
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<tr>
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</tbody>
</table>

**Description:** Displays the single-channel debounced status of the digital inputs DI 17, DI 19, and DI 21.

**Bit field:**

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>F-DI 0 second channel</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>01</td>
<td>F-DI 1 second channel</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
<tr>
<td>02</td>
<td>F-DI 2 second channel</td>
<td>High</td>
<td>Low</td>
<td>-</td>
</tr>
</tbody>
</table>

**Dependency:**

Refer to: p9501, p9601, p10117, p10140  
Refer to: r9501, p9601, p10117, p10140

**Note:**

F-DI: Failsafe Digital Input

If a safety function is assigned to an input (e.g. via p10122), then the following applies:
- logical "0": Safety function is selected
- logical "1": Safety function is de-selected

The interrelationship between the logical level and the external voltage level at the input depends on the parameterization (refer to p10140) of the input as either NC or NO contact and is aligned to the use of a safety function:

With 24 V at the input, NC contacts have a logical "1" level, for 0 V at the input, a logical "0" level.

This means that an NC/NC contact parameterization of 0 V at both inputs of the F-DI selects the safety function, for 24 V at both inputs, de-selects the safety function.

With 24 V at the input, NO contacts have a logical "0" level, for 0 V at the input, a logical "1" level.

This means that for an NC/NO contact parameterization, the level 0 V/24 V selects the safety function, the level 24 V/0 V de-selects the safety function.

The state of parameter r10151 is delayed by one monitoring clock cycle in relation to r10051.

The parameter is only updated in the following cases:
- If the Safety Extended Functions are enabled by means of activation via F-DI.
- If transfer of the F-DIs via PROFINET is enabled (see p9501).

This case only the F-DIs transferred for PROFINET are displayed and updated (see p10050/p10150). All F-DIs which have not been transferred have a static zero value.

**r10152.0**

**CO/BO: SI digital outputs status (processor 2) / SI DO status P2**

**SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN**

<table>
<thead>
<tr>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

**Data type:** Unsigned32  
**Dynamic index:** -  
**Func. diagram:** -  
**Units group:** -  
**Unit selection:** -  
**Not for motor type:** -  
**Scaling:** -  
**Expert list:** -  
**Min** | **Max** | **Factory setting** |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
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<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Description:** Displays the status of digital output DO 16- (X131.6) from processor 2.

**Bit field:**

<table>
<thead>
<tr>
<th>Bit</th>
<th>Signal name</th>
<th>1 signal</th>
<th>0 signal</th>
<th>FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>DO 0</td>
<td>High</td>
<td>Low</td>
<td>2853</td>
</tr>
</tbody>
</table>

**Note:**

F-DO: Failsafe Digital Output
### Description:
Allocates properties to run-time groups 0 to 9. This property comprises the sampling time and for p20000[x] = 9003, the instant of the call within the sampling time. Index x of p20000 corresponds to the number of the run-time group. p20000[0] is used to set the property of run-time group 0. ...

p20000[9] is used to set the property of run-time group 9.
p20000[x] = 0 run-time group is not calculated.
p20000[x] = 1 free run-time group T_sample = 1 * r20002
p20000[x] = 2 free run-time group T_sample = 2 * r20002
p20000[x] = 3 free run-time group T_sample = 3 * r20002
p20000[x] = 4 free run-time group T_sample = 4 * r20002
...

p20000[x] = 255 free run-time group T_sample = 255 * r20002
p20000[x] = 256 free run-time group T_sample = 256 * r20002
p20000[x] = 1001 free run-time group T_sample = 1 * r20003
p20000[x] = 1002 free run-time group T_sample = 2 * r20003
p20000[x] = 1003 free run-time group T_sample = 3 * r20003
p20000[x] = 1004 free run-time group T_sample = 4 * r20003
p20000[x] = 1005 free run-time group T_sample = 5 * r20003
p20000[x] = 1006 free run-time group T_sample = 6 * r20003
p20000[x] = 1007 free run-time group T_sample = 7 * r20003
p20000[x] = 1008 free run-time group T_sample = 8 * r20003
p20000[x] = 1010 free run-time group T_sample = 10 * r20003
p20000[x] = 1012 free run-time group T_sample = 12 * r20003
p20000[x] = 1016 free run-time group T_sample = 16 * r20003
p20000[x] = 1020 free run-time group T_sample = 20 * r20003
p20000[x] = 1024 free run-time group T_sample = 24 * r20003
p20000[x] = 1032 free run-time group T_sample = 32 * r20003
p20000[x] = 1040 free run-time group T_sample = 40 * r20003
p20000[x] = 1048 free run-time group T_sample = 48 * r20003
p20000[x] = 1064 free run-time group T_sample = 64 * r20003
p20000[x] = 1088 free run-time group T_sample = 96 * r20003
p20000[x] = 9003 fixed run-time group "calculate before setpoint channel" (only VECTOR, SERVO)

### Value:

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Do not calculate</td>
</tr>
<tr>
<td>1</td>
<td>T = 1 * r20002</td>
</tr>
<tr>
<td>2</td>
<td>T = 2 * r20002</td>
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<tr>
<td>3</td>
<td>T = 3 * r20002</td>
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<td>4</td>
<td>T = 4 * r20002</td>
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<td>5</td>
<td>T = 5 * r20002</td>
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<td>6</td>
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<td>8</td>
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<td>9</td>
<td>T = 9 * r20002</td>
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<tr>
<td>10</td>
<td>T = 10 * r20002</td>
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<tr>
<td>Parameter</td>
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<td>-----------</td>
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<tr>
<td>11: $T = 11 \times r20002$</td>
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<td>12: $T = 12 \times r20002$</td>
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<td>13: $T = 13 \times r20002$</td>
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<td>17: $T = 17 \times r20002$</td>
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Parameter

List of parameters

75:  T = 75 * r20002
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<td>151: T = 151 * r20002</td>
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<td>1010</td>
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<td>1012</td>
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<td>1016</td>
</tr>
</tbody>
</table>
1020: \( T = 20 \times r20003 \)
1024: \( T = 24 \times r20003 \)
1032: \( T = 32 \times r20003 \)
1040: \( T = 40 \times r20003 \)
1048: \( T = 48 \times r20003 \)
1064: \( T = 64 \times r20003 \)
1080: \( T = 80 \times r20003 \)
1096: \( T = 96 \times r20003 \)
9003: Before setp chann

Index:
[0] = Run-time group 0
[1] = Run-time group 1
[3] = Run-time group 3
[4] = Run-time group 4
[5] = Run-time group 5
[6] = Run-time group 6
[7] = Run-time group 7
[8] = Run-time group 8
[9] = Run-time group 9

Dependency:
Refer to: r20008

Caution:
The assignment of the properties of the run-time groups should not be changed on drives in operation as this could result in discontinuous signal transitions depending on the blocks used. At the 1st arithmetic cycle after the change, the respective internal initialization value is present at the block connections and in each subsequent cycle the calculated value is then present.

Note:
Re value = 1 ... 256:
This value can only be set if, for sampling time \( T_{\text{sample}} \) of this run-time group, the following applies: \( 1 \text{ ms} \leq T_{\text{sample}} \leq r20003 \).
If value = 9003:
The fixed run-time groups \( p20000[x] = 9003 \) log on with the sampling time of the setpoint channel, although the sampling time must be at least 1 ms. If, as a result of this limit, the actual sampling time deviates from the sampling time of the setpoint channel \( p0115[3] \), alarm A20103 is output. Another run-time group with a sampling time >= 1 ms should be selected. "Calculate before setpoint channel" means before function diagrams 3010, 3020, 3030, 3040, etc. are calculated, if the setpoint channel is activated (\( p0108.8 = 1 \)). If, e.g. for SERVO, a setpoint channel has not been configured (\( p0108.8 = 0 \)), then the calculation is made before function diagram 3095.

### r20001[0...9]

**Run-time group sampling time / RTG sampling time**

- **Can be changed:** `-`
- **Data type:** FloatingPoint32
- **Dynamic index:** `-`
- **Units group:** `-`
- **Expert list:** `1`
- **Min** `- [ms]`
- **Max** `- [ms]`
- **Access level:** `1`
- **Func. diagram:** `-`
- **Scaling:** `-`
- **Unit selection:** `-`

**Description:** Displays the current sampling time of the run-time group 0 to 9.

**Index:**
[0] = Run-time group 0
[1] = Run-time group 1
[3] = Run-time group 3
[4] = Run-time group 4
[5] = Run-time group 5
[6] = Run-time group 6
[7] = Run-time group 7
[8] = Run-time group 8
[9] = Run-time group 9
**Parameter**

**List of parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Notation</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>r20002</td>
<td>Basis sampling time, hardware / Basis samp time HW</td>
<td>Can be changed: -</td>
<td>[ms]</td>
<td>[ms]</td>
<td>[ms]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Calculated: -</td>
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<td></td>
<td>Access level: 1</td>
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<td></td>
<td>Data type: FloatingPoint32</td>
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<td>Dynamic index: -</td>
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<td></td>
<td>Units group: -</td>
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<td></td>
<td>Unit selection: -</td>
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<td></td>
<td>Not for motor type: -</td>
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<td></td>
<td>Scaling: -</td>
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<tr>
<td></td>
<td>Displays the lowest sampling time effective at this drive object for values 1 to 256 of p20000.</td>
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<tr>
<td></td>
<td>T_sample = p20000 * r20002</td>
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<tr>
<td>r20003</td>
<td>Basis sampling time, software / Basis samp time SW</td>
<td>Can be changed: -</td>
<td>[ms]</td>
<td>[ms]</td>
<td>[ms]</td>
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<td></td>
<td>Calculated: -</td>
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<td>Access level: 1</td>
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<td>Data type: FloatingPoint32</td>
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<td>Dynamic index: -</td>
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<td>Units group: -</td>
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<td>Unit selection: -</td>
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<td>Not for motor type: -</td>
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<td>Scaling: -</td>
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<tr>
<td></td>
<td>Displays the sampling time as factor effective on this drive object for values 1001 to 1096 of p20000.</td>
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<tr>
<td></td>
<td>T_sample = (p20000 - 1000) * r20003</td>
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<tr>
<td>r20005[0...9]</td>
<td>Average computing time load of the run-time groups / Comp_load RTG</td>
<td>Can be changed: -</td>
<td>[%]</td>
<td>[%]</td>
<td>[%]</td>
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<td></td>
<td>Calculated: -</td>
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<td>Access level: 3</td>
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<td>Data type: FloatingPoint32</td>
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<td>Dynamic index: -</td>
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<td>Units group: -</td>
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<td>Unit selection: -</td>
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<td>Not for motor type: -</td>
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<td>Scaling: -</td>
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<td></td>
<td>Share of the average computing time load which the FBLOCKS run-time group contributes to the overall computing time load for the drive unit (r9976).</td>
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<td>Index:</td>
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<td></td>
<td>0 = Run-time group 0</td>
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<td>1 = Run-time group 1</td>
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<td>2 = Run-time group 2</td>
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<td>3 = Run-time group 3</td>
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<td>4 = Run-time group 4</td>
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<td>5 = Run-time group 5</td>
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<td>6 = Run-time group 6</td>
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<td>7 = Run-time group 7</td>
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<td>8 = Run-time group 8</td>
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<td>9 = Run-time group 9</td>
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<td>Note: The run-time group to be measured has to be logged on (p20000[x] &gt; 0).</td>
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<tr>
<td></td>
<td>The value for the computation time load is calculated in the drive unit using the project loaded. As such, the r20005[x] values are not available in the expert list in SCOUT/STARTER offline mode.</td>
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</tbody>
</table>
### r20008[0...12]

**Hardware sampling times available / HW t_samp**

- **Value:** Can be changed: -
- **Data type:** FloatingPoint32
- **P-Group:** -
- **Not for motor type:** -

**Description:** Displays the assignment of the available hardware sampling times of the drive unit. The term "hardware sampling times" refers to those r20002 sampling times that are formed as a multiple of the basic sampling time and always < r20003.

**Dependency:** Refer to: p20000

**Notice:** For internal purposes, the drive unit always requires at least two (or several, depending on the parameterization of p0115 of the drive objects) free hardware sampling times. Therefore the current number of hardware sampling times that are still free can be read out in r7903.

If r7903=0, no additional sampling time that differs from r20008[0...12] can be provided from the Control Unit. If, when selecting in this state, a run-time group with a sampling time < r20003 (p20000 <= 255) is to be set in p20000, only run-time groups whose sampling time is already provided in r20008[0...12] can be selected.

**Note:** The 13 different sampling times available are displayed in r20008[0...12]. If the value of r20008[0...12] is not equal to 0, then it specifies the sampling time in ms. A sampling time that is provided can be simultaneously used by system functions, several FBLOCKS run-time groups, and several DCC run-time groups.

If the value of r20008[0...12] = 0, then this sampling time can still be freely assigned. It should be noted that the basic system, depending on the selected basic sampling times p0115[0], requires at least two (sometimes several) freely assignable hardware sampling times for internal functions. The number of hardware sampling times that can still be freely assigned can be read out in r7903.

- **r20008[11] = 99999.00000** → Hardware sampling time is not supported.
- **r20008[12] = 99999.00000** → Hardware sampling time is not supported.

The sampling time of run-time groups that have been assigned to the PROFIBUS run-time groups (p20000 = 4000...4004) is not displayed in r20008. For this sampling time, one of the internally and permanently assigned hardware sampling times is used.

**min** | **max** | **factory setting**
---|---|---
- [ms] | - [ms] | - [ms]

### p20020

**Computing time measurement run-time group / t_meas RTG**

- **Value:** Can be changed: U, T
- **Data type:** Unsigned32
- **P-Group:** -
- **Not for motor type:** -

**Description:** Only for internal Siemens service purposes.

**min** | **max** | **factory setting**
---|---|---
0 | 10 | 0
### p20022 Computing time measurement, duration / t_meas duration

**CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p20022</td>
<td>Computing time measurement, duration / t_meas duration</td>
<td>Only for internal Siemens service purposes.</td>
</tr>
<tr>
<td>Min</td>
<td>60 [s]</td>
<td>60 [s]</td>
</tr>
<tr>
<td>Max</td>
<td>10000 [s]</td>
<td></td>
</tr>
</tbody>
</table>

**Index:**

- [0] = Run-time group 0
- [1] = Run-time group 1
- [3] = Run-time group 3
- [4] = Run-time group 4
- [5] = Run-time group 5
- [6] = Run-time group 6
- [7] = Run-time group 7

**Access level:** 4
**Data type:** Unsigned32
**P-Group:** -
**Units group:** -
**Scaling:** -
**Expert list:** 1

**Can be changed:** U, T
**Calculated:** -
**Dynamic index:** -
**Unit selection:** -

**Description:**

- [0...9] Computing time, minimum value / t_comp min.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>r20024</td>
<td>Computing time, minimum value / t_comp min.</td>
<td>Only for internal Siemens service purposes.</td>
</tr>
<tr>
<td>Min</td>
<td>- [µs]</td>
<td>- [µs]</td>
</tr>
<tr>
<td>Max</td>
<td>- [µs]</td>
<td>- [µs]</td>
</tr>
</tbody>
</table>

**Index:**

- [0] = Run-time group 0
- [1] = Run-time group 1
- [3] = Run-time group 3
- [4] = Run-time group 4
- [5] = Run-time group 5
- [6] = Run-time group 6
- [7] = Run-time group 7

**Access level:** 4
**Data type:** FloatingPoint32
**P-Group:** -
**Units group:** -
**Scaling:** -
**Expert list:** 1

**Can be changed:** -
**Calculated:** -
**Dynamic index:** -
**Unit selection:** -

**Description:**

- [0...9] Computing time, mean value / t_comp average

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>r20025</td>
<td>Computing time, mean value / t_comp average</td>
<td>Only for internal Siemens service purposes.</td>
</tr>
<tr>
<td>Min</td>
<td>- [µs]</td>
<td>- [µs]</td>
</tr>
<tr>
<td>Max</td>
<td>- [µs]</td>
<td>- [µs]</td>
</tr>
</tbody>
</table>

**Index:**

- [0] = Run-time group 0
- [1] = Run-time group 1
- [3] = Run-time group 3
- [4] = Run-time group 4
- [5] = Run-time group 5
- [6] = Run-time group 6
- [7] = Run-time group 7

**Access level:** 4
**Data type:** FloatingPoint32
**P-Group:** -
**Units group:** -
**Scaling:** -
**Expert list:** 1

**Can be changed:** -
**Calculated:** -
**Dynamic index:** -
**Unit selection:** -

**Description:**
### List of parameters

[r20026][0...9] Computing time, maximum value / \( t_{\text{comp max.}} \)

**CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)**

<table>
<thead>
<tr>
<th>Description</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Only for internal Siemens service purposes.</td>
<td>- [( \mu \text{s} )]</td>
<td>- [( \mu \text{s} )]</td>
<td>- [( \mu \text{s} )]</td>
</tr>
</tbody>
</table>

**Index:**

- [0] = Run-time group 0
- [1] = Run-time group 1
- [3] = Run-time group 3
- [4] = Run-time group 4
- [5] = Run-time group 5
- [6] = Run-time group 6
- [7] = Run-time group 7
- [8] = Run-time group 8
- [9] = Run-time group 9

### p20030[0...3] BI: AND 0 inputs / AND 0 inputs

**CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)**

<table>
<thead>
<tr>
<th>Description</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sets the signal source of input quantities I0, I1, I2, I3 of instance AND 0 of the AND function block.</td>
<td>-</td>
<td>-</td>
<td>0</td>
</tr>
</tbody>
</table>

**Index:**

- [0] = Input I0
- [1] = Input I1
- [2] = Input I2
- [3] = Input I3

### r20031 BO: AND 0 output Q / AND 0 output Q

**CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)**

<table>
<thead>
<tr>
<th>Description</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display parameter for binary quantity Q = I0 &amp; I1 &amp; I2 &amp; I3 of instance AND 0 of the AND function block.</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
p20032  
**AND 0 run-time group / AND 0 RTG**

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Setting parameter for the run-time group in which the instance AND 0 of the AND function block is to be called.</td>
<td>0: Run-time group 0</td>
<td>9999</td>
</tr>
<tr>
<td>1: Run-time group 1</td>
<td></td>
<td>9999</td>
</tr>
<tr>
<td>2: Run-time group 2</td>
<td></td>
<td>9999</td>
</tr>
<tr>
<td>3: Run-time group 3</td>
<td></td>
<td>9999</td>
</tr>
<tr>
<td>4: Run-time group 4</td>
<td></td>
<td>9999</td>
</tr>
<tr>
<td>5: Run-time group 5</td>
<td></td>
<td>9999</td>
</tr>
<tr>
<td>6: Run-time group 6</td>
<td></td>
<td>9999</td>
</tr>
<tr>
<td>7: Run-time group 7</td>
<td></td>
<td>9999</td>
</tr>
<tr>
<td>8: Run-time group 8</td>
<td></td>
<td>9999</td>
</tr>
<tr>
<td>9: Run-time group 9</td>
<td></td>
<td>9999</td>
</tr>
<tr>
<td>9999: Do not calculate</td>
<td></td>
<td>9999</td>
</tr>
</tbody>
</table>

**Value:**
- 0: Run-time group 0
- 1: Run-time group 1
- 2: Run-time group 2
- 3: Run-time group 3
- 4: Run-time group 4
- 5: Run-time group 5
- 6: Run-time group 6
- 7: Run-time group 7
- 8: Run-time group 8
- 9: Run-time group 9
- 9999: Do not calculate

**Note:**
- The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

p20033  
**AND 0 run sequence / AND 0 RunSeq**

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Setting parameter for the run sequence of instance AND 0 within the run-time group set in p20032.</td>
<td>0: Run-time group 0</td>
<td>10</td>
</tr>
<tr>
<td>1: Run-time group 1</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>2: Run-time group 2</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>3: Run-time group 3</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>4: Run-time group 4</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>5: Run-time group 5</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>6: Run-time group 6</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>7: Run-time group 7</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>8: Run-time group 8</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>9: Run-time group 9</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>9999: Do not calculate</td>
<td></td>
<td>10</td>
</tr>
</tbody>
</table>

**Value:**
- 0: Run-time group 0
- 1: Run-time group 1
- 2: Run-time group 2
- 3: Run-time group 3
- 4: Run-time group 4
- 5: Run-time group 5
- 6: Run-time group 6
- 7: Run-time group 7
- 8: Run-time group 8
- 9: Run-time group 9
- 9999: Do not calculate

**Note:**
- The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

p20034[0...3]  
**BI: AND 1 inputs / AND 1 inputs**

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sets the signal source of input quantities I0, I1, I2, I3 of instance AND 1 of the AND function block.</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Index:**
- [0] = Input I0
- [1] = Input I1
- [2] = Input I2
- [3] = Input I3
### List of parameters

#### r20035
**BO: AND 1 output Q / AND 1 output Q**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>p20036</td>
<td>Can be changed: -</td>
<td>Calculated: -</td>
</tr>
<tr>
<td>Data type: Unsigned32</td>
<td>Dynamic index: -</td>
<td></td>
</tr>
<tr>
<td>P-Group: -</td>
<td>Units group: -</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td></td>
</tr>
</tbody>
</table>

**Value:**

- 0: Run-time group 0
- 1: Run-time group 1
- 2: Run-time group 2
- 3: Run-time group 3
- 4: Run-time group 4
- 5: Run-time group 5
- 6: Run-time group 6
- 7: Run-time group 7
- 8: Run-time group 8
- 9: Run-time group 9
- 9999: Do not calculate

**Min:** -
**Max:** -
**Factory setting:** -

**Description:**
Display parameter for binary quantity Q = I0 & I1 & I2 & I3 of instance AND 1 of the AND function block.

**Note:**
The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

#### p20036
**AND 1 run-time group / AND 1 RTG**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>p20036</td>
<td>Can be changed: T</td>
<td>Calculated: -</td>
</tr>
<tr>
<td>Data type: Integer16</td>
<td>Dynamic index: -</td>
<td></td>
</tr>
<tr>
<td>P-Group: -</td>
<td>Units group: -</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td></td>
</tr>
</tbody>
</table>

**Value:**

- 0: Run-time group 0
- 1: Run-time group 1
- 2: Run-time group 2
- 3: Run-time group 3
- 4: Run-time group 4
- 5: Run-time group 5
- 6: Run-time group 6
- 7: Run-time group 7
- 8: Run-time group 8
- 9: Run-time group 9
- 9999: Do not calculate

**Min:** 0
**Max:** 9999
**Factory setting:** 9999

**Description:**
Setting parameter for the run-time group in which the instance AND 1 of the AND function block is to be called.

#### p20037
**AND 1 run sequence / AND 1 RunSeq**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>p20037</td>
<td>Can be changed: T</td>
<td>Calculated: -</td>
</tr>
<tr>
<td>Data type: Unsigned16</td>
<td>Dynamic index: -</td>
<td></td>
</tr>
<tr>
<td>P-Group: -</td>
<td>Units group: -</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td></td>
</tr>
</tbody>
</table>

**Value:**

- 0: Run-time group 0
- 1: Run-time group 1
- 2: Run-time group 2
- 3: Run-time group 3
- 4: Run-time group 4
- 5: Run-time group 5
- 6: Run-time group 6
- 7: Run-time group 7
- 8: Run-time group 8
- 9: Run-time group 9
- 9999: Do not calculate

**Min:** 0
**Max:** 32000
**Factory setting:** 20

**Description:**
Setting parameter for the run sequence of instance AND 1 within the run-time group set in p20036.

**Note:**
The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.
**Parameter**

**List of parameters**

---

**p20038[0...3]**

BI: AND 2 inputs / AND 2 inputs

- **Can be changed:** T
- **Data type:** Unsigned32 / Binary
- **P-Group:** -
- **Not for motor type:** -

**Description:**
Sets the signal source of input quantities I0, I1, I2, I3 of instance AND 2 of the AND function block.

**Index:**
- [0] = Input I0
- [1] = Input I1
- [2] = Input I2
- [3] = Input I3

**Value:**

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>0</td>
</tr>
</tbody>
</table>

---

**r20039**

BO: AND 2 output Q / AND 2 output Q

- **Can be changed:** -
- **Data type:** Unsigned32
- **P-Group:** -
- **Not for motor type:** -

**Description:**
Display parameter for binary quantity Q = I0 & I1 & I2 & I3 of instance AND 2 of the AND function block.

**Value:**

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

---

**p20040**

AND 2 run-time group / AND 2 RTG

- **Can be changed:** T
- **Data type:** Integer16
- **P-Group:** -
- **Not for motor type:** -

**Description:**
Setting parameter for the run-time group in which the instance AND 2 of the AND function block is to be called.

**Value:**

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>9999</td>
<td>9999</td>
</tr>
</tbody>
</table>

---

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SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3
**Description:** Setting parameter for the run sequence of instance AND 2 within the run-time group set in p20040.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

**Description:** Sets the signal source of input quantities I0, I1, I2, I3 of instance AND 3 of the AND function block.

**Description:** Display parameter for binary quantity Q = I0 & I1 & I2 & I3 of instance AND 3 of the AND function block.
### p20044
**AND 3 run-time group / AND 3 RTG**

**CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)**

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>9999</td>
<td>9999</td>
</tr>
</tbody>
</table>

**Description:** Setting parameter for the run-time group in which the instance AND 3 of the AND function block is to be called.

**Value:**
- 0: Run-time group 0
- 1: Run-time group 1
- 2: Run-time group 2
- 3: Run-time group 3
- 4: Run-time group 4
- 5: Run-time group 5
- 6: Run-time group 6
- 7: Run-time group 7
- 8: Run-time group 8
- 9: Run-time group 9
- 9999: Do not calculate

**Data type:** Integer16
**P-Group:** -
**Not for motor type:** -
**Calculated:** -
**Dynamic index:** -
**Units group:** -
**Scaling:** -
**Access level:** 1
**Func. diag:** 7210

### p20045
**AND 3 run sequence / AND 3 RunSeq**

**CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)**

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>32000</td>
<td>40</td>
</tr>
</tbody>
</table>

**Description:** Setting parameter for the run sequence of instance AND 3 within the run-time group set in p20044.

**Note:**
The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

**Data type:** Unsigned16
**P-Group:** -
**Not for motor type:** -
**Calculated:** -
**Dynamic index:** -
**Units group:** -
**Scaling:** -
**Access level:** 1
**Func. diag:** 7210

### p20046[0...3]
**BI: OR 0 inputs / OR 0 inputs**

**CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)**

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>0</td>
</tr>
</tbody>
</table>

**Description:** Sets the signal source of input quantities I0, I1, I2, I3 of instance OR 0 of the OR function block.

**Data type:** Unsigned32 / Binary
**P-Group:** -
**Not for motor type:** -
**Calculated:** -
**Dynamic index:** -
**Units group:** -
**Scaling:** -
**Access level:** 1
**Func. diag:** 7212

**Index:**
- [0] = Input I0
- [1] = Input I1
- [2] = Input I2
- [3] = Input I3
### List of parameters

#### r20047
**BO: OR 0 output Q / OR 0 output Q**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CU_S110-CAN</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CU_S110-DP</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CU_S110-PN</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SERVO_S110-CAN</strong></td>
<td>(FBLOCKS)</td>
<td></td>
</tr>
<tr>
<td><strong>SERVO_S110-DP</strong></td>
<td>(FBLOCKS)</td>
<td></td>
</tr>
<tr>
<td><strong>SERVO_S110-PN</strong></td>
<td>(FBLOCKS)</td>
<td></td>
</tr>
<tr>
<td><strong>Can be changed:</strong></td>
<td>-</td>
<td>Display parameter for binary quantity Q = I0</td>
</tr>
<tr>
<td><strong>Data type:</strong></td>
<td>Unsigned32</td>
<td></td>
</tr>
<tr>
<td><strong>P-Group:</strong></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td><strong>Not for motor type:</strong></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td><strong>Min</strong></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td><strong>Max</strong></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td><strong>Factory setting</strong></td>
<td>9999</td>
<td></td>
</tr>
</tbody>
</table>

#### p20048
**OR 0 run-time group / OR 0 RTG**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CU_S110-CAN</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CU_S110-DP</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CU_S110-PN</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SERVO_S110-CAN</strong></td>
<td>(FBLOCKS)</td>
<td></td>
</tr>
<tr>
<td><strong>SERVO_S110-DP</strong></td>
<td>(FBLOCKS)</td>
<td></td>
</tr>
<tr>
<td><strong>SERVO_S110-PN</strong></td>
<td>(FBLOCKS)</td>
<td></td>
</tr>
<tr>
<td><strong>Can be changed:</strong></td>
<td>T</td>
<td>Setting parameter for the run-time group in which the instance OR 0 of the OR function block is to be called.</td>
</tr>
<tr>
<td><strong>Data type:</strong></td>
<td>Integer16</td>
<td></td>
</tr>
<tr>
<td><strong>P-Group:</strong></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td><strong>Not for motor type:</strong></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td><strong>Min</strong></td>
<td>0</td>
<td></td>
</tr>
<tr>
<td><strong>Max</strong></td>
<td>9999</td>
<td></td>
</tr>
<tr>
<td><strong>Factory setting</strong></td>
<td>9999</td>
<td></td>
</tr>
</tbody>
</table>

#### p20049
**OR 0 run sequence / OR 0 RunSeq**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CU_S110-CAN</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CU_S110-DP</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CU_S110-PN</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SERVO_S110-CAN</strong></td>
<td>(FBLOCKS)</td>
<td></td>
</tr>
<tr>
<td><strong>SERVO_S110-DP</strong></td>
<td>(FBLOCKS)</td>
<td></td>
</tr>
<tr>
<td><strong>SERVO_S110-PN</strong></td>
<td>(FBLOCKS)</td>
<td></td>
</tr>
<tr>
<td><strong>Can be changed:</strong></td>
<td>T</td>
<td>Setting parameter for the run sequence of instance OR 0 within the run-time group set in p20048.</td>
</tr>
<tr>
<td><strong>Data type:</strong></td>
<td>Unsigned16</td>
<td></td>
</tr>
<tr>
<td><strong>P-Group:</strong></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td><strong>Not for motor type:</strong></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td><strong>Min</strong></td>
<td>0</td>
<td></td>
</tr>
<tr>
<td><strong>Max</strong></td>
<td>32000</td>
<td></td>
</tr>
<tr>
<td><strong>Factory setting</strong></td>
<td>60</td>
<td></td>
</tr>
</tbody>
</table>
**Parameter**

**List of parameters**

---

**p20050[0...3]**

**BI: OR 1 inputs / OR 1 inputs**

- **Can be changed:** T
- **Data type:** Unsigned32 / Binary
- **P-Group:** -
- **Not for motor type:** -

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>0</td>
</tr>
</tbody>
</table>

**Description:**
Sets the signal source of input quantities I0, I1, I2, I3 of instance OR 1 of the OR function block.

**Index:**

- [0] = Input I0
- [1] = Input I1
- [2] = Input I2
- [3] = Input I3

---

**r20051**

**BO: OR 1 output Q / OR 1 output Q**

- **Can be changed:** -
- **Data type:** Unsigned32
- **P-Group:** -
- **Not for motor type:** -

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Description:**
Display parameter for binary quantity Q = I0 | I1 | I2 | I3 of instance OR 1 of the OR function block.

---

**p20052**

**OR 1 run-time group / OR 1 RTG**

- **Can be changed:** T
- **Data type:** Integer16
- **P-Group:** -
- **Not for motor type:** -

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>9999</td>
<td>9999</td>
</tr>
</tbody>
</table>

**Description:**
Setting parameter for the run-time group in which the instance OR 1 of the OR function block is to be called.

**Value:**

- 0: Run-time group 0
- 1: Run-time group 1
- 2: Run-time group 2
- 3: Run-time group 3
- 4: Run-time group 4
- 5: Run-time group 5
- 6: Run-time group 6
- 7: Run-time group 7
- 8: Run-time group 8
- 9: Run-time group 9
- 9999: Do not calculate
### p20053  OR 1 run sequence / OR 1 RunSeq

- **CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)**
- **Can be changed**: T
- **Data type**: Unsigned16
- **P-Group**: -
- **Not for motor type**: -

<table>
<thead>
<tr>
<th>Description</th>
<th>Setting parameter for the run sequence of instance OR 1 within the run-time group set in p20052.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Note</td>
<td>The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>32000</td>
<td>70</td>
</tr>
</tbody>
</table>

### p20054[0...3]  BI: OR 2 inputs / OR 2 inputs

- **CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)**
- **Can be changed**: T
- **Data type**: Unsigned32 / Binary
- **P-Group**: -
- **Not for motor type**: -

<table>
<thead>
<tr>
<th>Description</th>
<th>Sets the signal source of input quantities I0, I1, I2, I3 of instance OR 2 of the OR function block.</th>
</tr>
</thead>
</table>
| Index       | [0] = Input I0  
|             | [1] = Input I1  
|             | [2] = Input I2  
|             | [3] = Input I3  |

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>0</td>
</tr>
</tbody>
</table>

### r20055  BO: OR 2 output Q / OR 2 output Q

- **CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)**
- **Can be changed**: -
- **Data type**: Unsigned32
- **P-Group**: -
- **Not for motor type**: -

| Description | Display parameter for binary quantity Q = I0 | I1 | I2 | I3 of instance OR 2 of the OR function block. |

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

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SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3
### p20056

**OR 2 run-time group / OR 2 RTG**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CU_S110-CAN,</strong></td>
<td>Run-time group 0</td>
</tr>
<tr>
<td><strong>CU_S110-DP,</strong></td>
<td>Run-time group 1</td>
</tr>
<tr>
<td><strong>CU_S110-PN,</strong></td>
<td>Run-time group 2</td>
</tr>
<tr>
<td><strong>SERVO_S110-CAN</strong></td>
<td>Run-time group 3</td>
</tr>
<tr>
<td><strong>(FBLOCKS),</strong></td>
<td>Run-time group 4</td>
</tr>
<tr>
<td><strong>SERVO_S110-DP</strong></td>
<td>Run-time group 5</td>
</tr>
<tr>
<td><strong>(FBLOCKS),</strong></td>
<td>Run-time group 6</td>
</tr>
<tr>
<td><strong>SERVO_S110-PN</strong></td>
<td>Run-time group 7</td>
</tr>
<tr>
<td><strong>(FBLOCKS)</strong></td>
<td>Run-time group 8</td>
</tr>
<tr>
<td><strong>9999:</strong></td>
<td>Run-time group 9</td>
</tr>
</tbody>
</table>

**Description:** Setting parameter for the run-time group in which the instance OR 2 of the OR function block is to be called.

**Value:**

- 0: Run-time group 0
- 1: Run-time group 1
- 2: Run-time group 2
- 3: Run-time group 3
- 4: Run-time group 4
- 5: Run-time group 5
- 6: Run-time group 6
- 7: Run-time group 7
- 8: Run-time group 8
- 9: Run-time group 9
- 9999: Do not calculate

### p20057

**OR 2 run sequence / OR 2 RunSeq**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CU_S110-CAN,</strong></td>
<td>Run-time group 0</td>
</tr>
<tr>
<td><strong>CU_S110-DP,</strong></td>
<td>Run-time group 1</td>
</tr>
<tr>
<td><strong>CU_S110-PN,</strong></td>
<td>Run-time group 2</td>
</tr>
<tr>
<td><strong>SERVO_S110-CAN</strong></td>
<td>Run-time group 3</td>
</tr>
<tr>
<td><strong>(FBLOCKS),</strong></td>
<td>Run-time group 4</td>
</tr>
<tr>
<td><strong>SERVO_S110-DP</strong></td>
<td>Run-time group 5</td>
</tr>
<tr>
<td><strong>(FBLOCKS),</strong></td>
<td>Run-time group 6</td>
</tr>
<tr>
<td><strong>SERVO_S110-PN</strong></td>
<td>Run-time group 7</td>
</tr>
<tr>
<td><strong>(FBLOCKS)</strong></td>
<td>Run-time group 8</td>
</tr>
<tr>
<td><strong>9999:</strong></td>
<td>Run-time group 9</td>
</tr>
</tbody>
</table>

**Description:** Setting parameter for the run sequence of instance OR 2 within the run-time group set in p20056.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

### p20058[0...3]

**BI: OR 3 inputs / OR 3 inputs**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CU_S110-CAN,</strong></td>
<td>Input I0</td>
</tr>
<tr>
<td><strong>CU_S110-DP,</strong></td>
<td>Input I1</td>
</tr>
<tr>
<td><strong>CU_S110-PN,</strong></td>
<td>Input I2</td>
</tr>
<tr>
<td><strong>SERVO_S110-CAN</strong></td>
<td>Input I3</td>
</tr>
<tr>
<td><strong>(FBLOCKS),</strong></td>
<td></td>
</tr>
<tr>
<td><strong>SERVO_S110-DP</strong></td>
<td></td>
</tr>
<tr>
<td><strong>(FBLOCKS),</strong></td>
<td></td>
</tr>
<tr>
<td><strong>SERVO_S110-PN</strong></td>
<td></td>
</tr>
<tr>
<td><strong>(FBLOCKS)</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Sets the signal source of input quantities I0, I1, I2, I3 of instance OR 3 of the OR function block.

**Index:**

- [0] = Input I0
- [1] = Input I1
- [2] = Input I2
- [3] = Input I3
### r20059
**BO: OR 3 output Q / OR 3 output Q**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Setting</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BO: OR 3 output Q / OR 3 output Q</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can be changed:</td>
<td>-</td>
<td>Calculated:</td>
<td>Access level:</td>
</tr>
<tr>
<td>Data type:</td>
<td>Unsigned32</td>
<td>Dynamic index:</td>
<td>1</td>
</tr>
<tr>
<td>P-Group:</td>
<td>-</td>
<td>Units group:</td>
<td></td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
<td>Scaling:</td>
<td></td>
</tr>
</tbody>
</table>

**Min** | **Max** | **Factory setting**
--- | --- | ---
- | - | -

**Description:**
Display parameter for binary quantity Q = I0 | I1 | I2 | I3 of instance OR 3 of the OR function block.

**Value:**
- Run-time group 0
- Run-time group 1
- Run-time group 2
- Run-time group 3
- Run-time group 4
- Run-time group 5
- Run-time group 6
- Run-time group 7
- Run-time group 8
- Run-time group 9
- Do not calculate

### p20060
**OR 3 run-time group / OR 3 RTG**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Setting</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>p20060 OR 3 run-time group / OR 3 RTG</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can be changed:</td>
<td>T</td>
<td>Calculated:</td>
<td>Access level:</td>
</tr>
<tr>
<td>Data type:</td>
<td>Integer16</td>
<td>Dynamic index:</td>
<td>1</td>
</tr>
<tr>
<td>P-Group:</td>
<td>-</td>
<td>Units group:</td>
<td></td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
<td>Scaling:</td>
<td></td>
</tr>
</tbody>
</table>

**Min** | **Max** | **Factory setting**
--- | --- | ---
0 | 9999 | 9999

**Description:**
Setting parameter for the run-time group in which the instance OR 3 of the OR function block is to be called.

**Value:**
- Run-time group 0
- Run-time group 1
- Run-time group 2
- Run-time group 3
- Run-time group 4
- Run-time group 5
- Run-time group 6
- Run-time group 7
- Run-time group 8
- Run-time group 9
- Do not calculate

### p20061
**OR 3 run sequence / OR 3 RunSeq**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Setting</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>p20061 OR 3 run sequence / OR 3 RunSeq</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can be changed:</td>
<td>T</td>
<td>Calculated:</td>
<td>Access level:</td>
</tr>
<tr>
<td>Data type:</td>
<td>Unsigned16</td>
<td>Dynamic index:</td>
<td>1</td>
</tr>
<tr>
<td>P-Group:</td>
<td>-</td>
<td>Units group:</td>
<td></td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
<td>Scaling:</td>
<td></td>
</tr>
</tbody>
</table>

**Min** | **Max** | **Factory setting**
--- | --- | ---
0 | 32000 | 90

**Description:**
Setting parameter for the run sequence of instance OR 3 within the run-time group set in p20060.

**Note:**
The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.
## List of parameters

### p20062[0...3]

**Bi: XOR 0 inputs / XOR 0 inputs**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Index</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>p20062[0...3]</td>
<td>Can be changed: T</td>
<td>[0] = Input I0</td>
<td>0</td>
</tr>
<tr>
<td>Data type: Unsigned32 / Binary</td>
<td>[1] = Input I1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>[2] = Input I2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[3] = Input I3</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Sets the signal source of input quantities I0, I1, I2, I3 of instance XOR 0 of the XOR function block.

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>0</td>
</tr>
</tbody>
</table>

**Index:**

- [0] = Input I0
- [1] = Input I1
- [2] = Input I2
- [3] = Input I3

### r20063

**Bo: XOR 0 output Q / XOR 0 output Q**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>r20063</td>
<td>Can be changed: -</td>
<td></td>
</tr>
<tr>
<td>Data type: Unsigned32</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Display parameter for binary quantity Q of instance XOR 0 of the XOR function block.

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

### p20064

**XOR 0 run-time group / XOR 0 RTG**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>p20064</td>
<td>Can be changed: T</td>
<td>Run-time group 0</td>
</tr>
<tr>
<td>Data type: Integer16</td>
<td>Run-time group 1</td>
<td></td>
</tr>
<tr>
<td>P-Group: -</td>
<td>Run-time group 2</td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Run-time group 3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Run-time group 4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Run-time group 5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Run-time group 6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Run-time group 7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Run-time group 8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Run-time group 9</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Do not calculate</td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Setting parameter for the run-time group in which the instance XOR 0 of the XOR function block is to be called.

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>9999</td>
<td>9999</td>
</tr>
<tr>
<td>Parameter</td>
<td>Description</td>
<td>Data type</td>
</tr>
<tr>
<td>-----------</td>
<td>-------------</td>
<td>-----------</td>
</tr>
<tr>
<td>p20065</td>
<td>XOR 0 run sequence / XOR 0 RunSeq</td>
<td>Unsigned16</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dynamic Index: -</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Units group: -</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Scaling: -</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
</tr>
<tr>
<td>0</td>
<td>32000</td>
<td>110</td>
</tr>
<tr>
<td>Note:</td>
<td>Setting parameter for the run sequence of instance XOR 0 within the run-time group set in p20064.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.</td>
<td></td>
</tr>
</tbody>
</table>

| p20066[0...3] | BI: XOR 1 inputs / XOR 1 inputs | Unsigned32 / Binary | 1            | -           | 1           |
|               | Calculated: - | Dynamic Index: - |             | -           |             |
|               | Units group: - | Scaling: - |             |             |             |
| Min       | Max         | Factory setting |
| -         | -          | 0           |
| Description: | Sets the signal source of input quantities I0, I1, I2, I3 of instance XOR 1 of the XOR function block. | | |

<p>| r20067 | BO: XOR 1 output Q / XOR 1 output Q | Unsigned32 | 1            | -           | 1           |
|        | Calculated: - | Dynamic Index: - |             | -           |             |
|        | Units group: - | Scaling: - |             |             |             |</p>
<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description:</td>
<td>Display parameter for binary quantity Q of instance XOR 1 of the XOR function block.</td>
<td></td>
</tr>
</tbody>
</table>
### p20068 XOR 1 run-time group / XOR 1 RTG

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p20068</td>
<td>Setting parameter for the run-time group in which the instance XOR 1 of the XOR function block is to be called.</td>
<td>0: Run-time group 0, 1: Run-time group 1, 2: Run-time group 2, 3: Run-time group 3, 4: Run-time group 4, 5: Run-time group 5, 6: Run-time group 6, 7: Run-time group 7, 8: Run-time group 8, 9: Run-time group 9, 9999: Do not calculate</td>
<td>9999</td>
</tr>
</tbody>
</table>

**Data type:** Integer16  
**P-Group:** -  
**Not for motor type:** -  
**Access level:** 1  
**Func. diagram:** 7214  
**Unit selection:** -  
**Expert list:** 1

### p20069 XOR 1 run sequence / XOR 1 RunSeq

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p20069</td>
<td>Setting parameter for the run sequence of instance XOR 1 within the run-time group set in p20068. The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.</td>
<td>0: Run-time group 0, 1: Run-time group 1, 2: Run-time group 2, 3: Run-time group 3, 4: Run-time group 4, 5: Run-time group 5, 6: Run-time group 6, 7: Run-time group 7, 8: Run-time group 8, 9: Run-time group 9, 9999: Do not calculate</td>
<td>120</td>
</tr>
</tbody>
</table>

**Data type:** Unsigned16  
**P-Group:** -  
**Not for motor type:** -  
**Access level:** 1  
**Func. diagram:** 7214  
**Unit selection:** -  
**Expert list:** 1

### p20070[0...3] BI: XOR 2 inputs / XOR 2 inputs

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p20070</td>
<td>Sets the signal source of input quantities I0, I1, I2, I3 of instance XOR 2 of the XOR function block.</td>
<td>[0] = Input I0, [1] = Input I1, [2] = Input I2, [3] = Input I3</td>
<td>0</td>
</tr>
</tbody>
</table>

**Data type:** Unsigned32 / Binary  
**P-Group:** -  
**Not for motor type:** -  
**Access level:** 1  
**Func. diagram:** 7214  
**Unit selection:** -  
**Expert list:** 1
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Can be changed</th>
<th>Calculated</th>
<th>Data type</th>
<th>Dynamic index</th>
<th>P-Group</th>
<th>Units group</th>
<th>Access level</th>
<th>Func. diagram</th>
<th>Expert list</th>
<th>Not for motor type</th>
<th>Access level</th>
<th>Units group</th>
<th>Unit selection</th>
<th>Scaling</th>
<th>Expert list</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>r20071 BO: XOR 2 output Q / XOR 2 output Q</td>
<td>Display parameter for binary quantity Q of instance XOR 2 of the XOR function block.</td>
<td>-</td>
<td>-</td>
<td>Unsigned32</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>7214</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>p20072 XOR 2 run-time group / XOR 2 RTG</td>
<td>Setting parameter for the run-time group in which the instance XOR 2 of the XOR function block is to be called.</td>
<td>T</td>
<td>-</td>
<td>Integer16</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>7214</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>p20073 XOR 2 run sequence / XOR 2 RunSeq</td>
<td>Setting parameter for the run sequence of instance XOR 2 within the run-time group set in p20072.</td>
<td>T</td>
<td>-</td>
<td>Unsigned16</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>7214</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### p20074[0...3]
**BI: XOR 3 inputs / XOR 3 inputs**

**Description:**
Sets the signal source of input quantities I0, I1, I2, I3 of instance XOR 3 of the XOR function block.

**Index:**
- [0] = Input I0
- [1] = Input I1
- [2] = Input I2
- [3] = Input I3

**Values:**
- 0: Run-time group 0
- 1: Run-time group 1
- 2: Run-time group 2
- 3: Run-time group 3
- 4: Run-time group 4
- 5: Run-time group 5
- 6: Run-time group 6
- 7: Run-time group 7
- 8: Run-time group 8
- 9: Run-time group 9
- 9999: Do not calculate

**Type:**
- Can be changed: T
- Data type: Unsigned32 / Binary
- P-Group: -
- Not for motor type: -
- Calculated: -
- Dynamic index: -
- Units group: -
- Scaling: -
- Access level: 1

### r20075
**BO: XOR 3 output Q / XOR 3 output Q**

**Description:**
Display parameter for binary quantity Q of instance XOR 3 of the XOR function block.

**Values:**
- 0: Run-time group 0
- 1: Run-time group 1
- 2: Run-time group 2
- 3: Run-time group 3
- 4: Run-time group 4
- 5: Run-time group 5
- 6: Run-time group 6
- 7: Run-time group 7
- 8: Run-time group 8
- 9: Run-time group 9
- 9999: Do not calculate

**Type:**
- Can be changed: -
- Data type: Unsigned32
- P-Group: -
- Not for motor type: -
- Calculated: -
- Dynamic index: -
- Units group: -
- Scaling: -
- Access level: 1

### p20076
**XOR 3 run-time group / XOR 3 RTG**

**Description:**
Setting parameter for the run-time group in which the instance XOR 3 of the XOR function block is to be called.

**Values:**
- 0: Run-time group 0
- 1: Run-time group 1
- 2: Run-time group 2
- 3: Run-time group 3
- 4: Run-time group 4
- 5: Run-time group 5
- 6: Run-time group 6
- 7: Run-time group 7
- 8: Run-time group 8
- 9: Run-time group 9
- 9999: Do not calculate

**Type:**
- Can be changed: T
- Data type: Integer16
- P-Group: -
- Not for motor type: -
- Calculated: -
- Dynamic index: -
- Units group: -
- Scaling: -
- Access level: 1
### List of parameters

#### p20077 XOR 3 run sequence / XOR 3 RunSeq

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p20077</td>
<td></td>
<td>0</td>
<td>32000</td>
<td>140</td>
</tr>
</tbody>
</table>

**Description:** Setting parameter for the run sequence of instance XOR 3 within the run-time group set in p20076.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

#### p20078 BI: NOT 0 input I / NOT 0 input I

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p20078</td>
<td></td>
<td></td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Sets the signal source of input quantity I of instance NOT 0 of the inverter.

#### r20079 BO: NOT 0 inverted output / NOT 0 inv output

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>r20079</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Display parameter for the inverted output of instance NOT 0 of the inverter.

#### p20080 NOT 0 run-time group / NOT 0 RTG

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p20080</td>
<td></td>
<td>0</td>
<td>9999</td>
<td>9999</td>
</tr>
</tbody>
</table>

**Description:** Setting parameter for the run-time group in which the instance NOT 0 of the inverter is to be called.
### List of parameters

#### p20081 NOT 0 run sequence / NOT 0 RunSeq

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Run-time group 0</td>
<td>Setting parameter for the run sequence of instance NOT 0 within the run-time group set in p20080.</td>
</tr>
<tr>
<td>1</td>
<td>Run-time group 1</td>
<td>The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.</td>
</tr>
<tr>
<td>2</td>
<td>Run-time group 2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Run-time group 3</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Run-time group 4</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Run-time group 5</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Run-time group 6</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Run-time group 7</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Run-time group 8</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Run-time group 9</td>
<td></td>
</tr>
<tr>
<td>9999</td>
<td>Do not calculate</td>
<td></td>
</tr>
</tbody>
</table>

**Value:**
- 0: Run-time group 0
- 1: Run-time group 1
- 2: Run-time group 2
- 3: Run-time group 3
- 4: Run-time group 4
- 5: Run-time group 5
- 6: Run-time group 6
- 7: Run-time group 7
- 8: Run-time group 8
- 9: Run-time group 9
- 9999: Do not calculate

**Description:**
- Setting parameter for the run sequence of instance NOT 0 within the run-time group set in p20080.
- The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

**Data type:** Unsigned16
**Dynamic index:** -
**Units group:** -
**Expert list:** 1
**Func. diagram:** 7216
**Access level:** 1

**Data type:** Unsigned32
**Dynamic index:** -
**Units group:** -
**Expert list:** 1
**Func. diagram:** 7216
**Access level:** 1

**Description:**
- Setting parameter for the run sequence of instance NOT 0 within the run-time group set in p20080.
- The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

#### p20082 BI: NOT 1 input I / NOT 1 input I

**Value:**
- 0: Run-time group 0
- 1: Run-time group 1
- 2: Run-time group 2
- 3: Run-time group 3
- 4: Run-time group 4
- 5: Run-time group 5
- 6: Run-time group 6
- 7: Run-time group 7
- 8: Run-time group 8
- 9: Run-time group 9
- 9999: Do not calculate

**Description:**
- Setting parameter for the run sequence of instance NOT 0 within the run-time group set in p20080.
- The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

**Data type:** Unsigned32 / Binary
**Dynamic index:** -
**Units group:** -
**Expert list:** 1
**Func. diagram:** 7216
**Access level:** 1

**Description:**
- Setting parameter for the run sequence of instance NOT 0 within the run-time group set in p20080.
- The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

#### p20083 BO: NOT 1 inverted output / NOT 1 inv output

**Value:**
- 0: Run-time group 0
- 1: Run-time group 1
- 2: Run-time group 2
- 3: Run-time group 3
- 4: Run-time group 4
- 5: Run-time group 5
- 6: Run-time group 6
- 7: Run-time group 7
- 8: Run-time group 8
- 9: Run-time group 9
- 9999: Do not calculate

**Description:**
- Display parameter for the inverted output of instance NOT 1 of the inverter.

**Data type:** Unsigned32
**Dynamic index:** -
**Units group:** -
**Expert list:** 1
**Func. diagram:** 7216
**Access level:** 1

**Description:**
- Display parameter for the inverted output of instance NOT 1 of the inverter.
### p20084 NOT 1 run-time group / NOT 1 RTG

**CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)**

<table>
<thead>
<tr>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>T</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>

**Data type:** Integer16  
**P-Group:** -  
**Not for motor type:** -  
**Dynamic index:** -  
**Units group:** -  
**Unit selection:** -  
**Scaling:** -  
**Expert list:** 1

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>9999</td>
<td>9999</td>
</tr>
</tbody>
</table>

**Description:** Setting parameter for the run-time group in which the instance NOT 1 of the inverter is to be called.

**Value:**

0: Run-time group 0  
1: Run-time group 1  
2: Run-time group 2  
3: Run-time group 3  
4: Run-time group 4  
5: Run-time group 5  
6: Run-time group 6  
7: Run-time group 7  
8: Run-time group 8  
9: Run-time group 9  
9999: Do not calculate

### p20085 NOT 1 run sequence / NOT 1 RunSeq

**CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)**

<table>
<thead>
<tr>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>T</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>

**Data type:** Unsigned16  
**P-Group:** -  
**Not for motor type:** -  
**Dynamic index:** -  
**Units group:** -  
**Unit selection:** -  
**Scaling:** -  
**Expert list:** 1

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>32000</td>
<td>170</td>
</tr>
</tbody>
</table>

**Description:** Setting parameter for the run sequence of instance NOT 1 within the run-time group set in p20084.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

### p20086 BI: NOT 2 input I / NOT 2 input I

**CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)**

<table>
<thead>
<tr>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>T</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>

**Data type:** Unsigned32 / Binary  
**P-Group:** -  
**Not for motor type:** -  
**Dynamic index:** -  
**Units group:** -  
**Unit selection:** -  
**Scaling:** -  
**Expert list:** 1

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>0</td>
</tr>
</tbody>
</table>

**Description:** Sets the signal source of input quantity I of instance NOT 2 of the inverter.
### Parameter List of parameters

**r20087**

**BO: NOT 2 inverted output / NOT 2 inv output**

- **CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)**

**Description:** Display parameter for the inverted output of instance NOT 2 of the inverter.

**Value:**
- **0:** Run-time group 0
- **1:** Run-time group 1
- **2:** Run-time group 2
- **3:** Run-time group 3
- **4:** Run-time group 4
- **5:** Run-time group 5
- **6:** Run-time group 6
- **7:** Run-time group 7
- **8:** Run-time group 8
- **9:** Run-time group 9
- **9999:** Do not calculate

**Can be changed:** -  
**Calculated:** -  
**Access level:** 1  
**Data type:** Unsigned32  
**Dynamic index:** -  
**Units group:** -  
**Unit selection:** -  
**Not for motor type:** -  
**Scaling:** -  
**Func. diagram:** 7216  
**Expert list:** 1

**Min** | **Max** | **Factory setting**
---|---|---
- | - | -

**Description:** Setting parameter for the run-time group in which the instance NOT 2 of the inverter is to be called.

**Value:**
- **0:** Run-time group 0
- **1:** Run-time group 1
- **2:** Run-time group 2
- **3:** Run-time group 3
- **4:** Run-time group 4
- **5:** Run-time group 5
- **6:** Run-time group 6
- **7:** Run-time group 7
- **8:** Run-time group 8
- **9:** Run-time group 9
- **9999:** Do not calculate

**Can be changed:** T  
**Calculated:** -  
**Access level:** 1  
**Data type:** Integer16  
**Dynamic index:** -  
**Units group:** -  
**Unit selection:** -  
**P-Group:** -  
**Not for motor type:** -  
**Scaling:** -  
**Func. diagram:** 7216  
**Expert list:** 1

**Min** | **Max** | **Factory setting**
---|---|---
0 | 9999 | 9999

**p20089**

**NOT 2 run sequence / NOT 2 RunSeq**

- **CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)**

**Description:** Setting parameter for the run sequence of instance NOT 2 within the run-time group set in p20088.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

**Can be changed:** T  
**Calculated:** -  
**Access level:** 1  
**Data type:** Unsigned16  
**Dynamic index:** -  
**Units group:** -  
**Unit selection:** -  
**P-Group:** -  
**Not for motor type:** -  
**Scaling:** -  
**Func. diagram:** 7216  
**Expert list:** 1

**Min** | **Max** | **Factory setting**
---|---|---
0 | 32000 | 180
### List of parameters

**p20090**  
**BI: NOT 3 input I / NOT 3 input I**  
Can be changed: T  
Data type: Unsigned32 / Binary  
P-Group: -  
Not for motor type: -  

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>0</td>
</tr>
</tbody>
</table>

**Description:** Sets the signal source of input quantity I of instance NOT 3 of the inverter.

**r20091**  
**BO: NOT 3 inverted output / NOT 3 inv output**  
Can be changed: -  
Data type: Unsigned32  
P-Group: -  
Not for motor type: -  

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Description:** Display parameter for the inverted output of instance NOT 3 of the inverter.

**p20092**  
**NOT 3 run-time group / NOT 3 RTG**  
Can be changed: T  
Data type: Integer16  
P-Group: -  
Not for motor type: -  

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>9999</td>
<td>9999</td>
</tr>
</tbody>
</table>

**Description:** Setting parameter for the run-time group in which the instance NOT 3 of the inverter is to be called.

**Value:**  
0: Run-time group 0  
1: Run-time group 1  
2: Run-time group 2  
3: Run-time group 3  
4: Run-time group 4  
5: Run-time group 5  
6: Run-time group 6  
7: Run-time group 7  
8: Run-time group 8  
9: Run-time group 9  
9999: Do not calculate
**Parameter**

**List of parameters**

---

**p20093**

**NOT 3 run sequence / NOT 3 RunSeq**

<table>
<thead>
<tr>
<th></th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>T</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Data type:</th>
<th>Dynamic index:</th>
<th>Func. diagram:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unsigned16</td>
<td>-</td>
<td>7216</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>P-Group:</th>
<th>Units group:</th>
<th>Unit selection:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Not for motor type:</th>
<th>Scaling:</th>
<th>Expert list:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>

**Description:** Setting parameter for the run sequence of instance NOT 3 within the run-time group set in p20092.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

---

**Index:**

<table>
<thead>
<tr>
<th></th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>32000</td>
<td>190</td>
</tr>
</tbody>
</table>

---

**p20094[0...3]**

**CI: ADD 0 inputs / ADD 0 inputs**

<table>
<thead>
<tr>
<th></th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>T</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Data type:</th>
<th>Dynamic index:</th>
<th>Func. diagram:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unsigned32 / FloatingPoint32</td>
<td>-</td>
<td>7220</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>P-Group:</th>
<th>Units group:</th>
<th>Unit selection:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Not for motor type:</th>
<th>Scaling:</th>
<th>Expert list:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-</td>
<td>PERCENT</td>
<td>1</td>
</tr>
</tbody>
</table>

**Description:** Sets the signal source of input quantities X0, X1, X2, X3 of instance ADD 0 of the adder.

**Index:**

- [0] = Input X0
- [1] = Input X1
- [2] = Input X2
- [3] = Input X3

---

**r20095**

**CO: ADD 0 output Y / ADD 0 output Y**

<table>
<thead>
<tr>
<th></th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Data type:</th>
<th>Dynamic index:</th>
<th>Func. diagram:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FloatingPoint32</td>
<td>-</td>
<td>7220</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>P-Group:</th>
<th>Units group:</th>
<th>Unit selection:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Not for motor type:</th>
<th>Scaling:</th>
<th>Expert list:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-</td>
<td>PERCENT</td>
<td>1</td>
</tr>
</tbody>
</table>

**Description:** Display parameter for the output quantity Y = X0 + X1 + X2 + X3 of instance ADD 0 of the adder.
### List of parameters

#### p20096
**ADD 0 run-time group / ADD 0 RTG**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>p20096ADD 0 run-time group / ADD 0 RTG</td>
<td>Setting parameter for the run-time group in which the instance ADD 0 of the adder is to be called.</td>
<td>0: Run-time group 0 1: Run-time group 1 2: Run-time group 2 3: Run-time group 3 4: Run-time group 4 5: Run-time group 5 6: Run-time group 6 7: Run-time group 7 8: Run-time group 8 9: Run-time group 9 9999: Do not calculate</td>
</tr>
</tbody>
</table>

#### p20097
**ADD 0 run sequence / ADD 0 RunSeq**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>p20097ADD 0 run sequence / ADD 0 RunSeq</td>
<td>Setting parameter for the run sequence of instance ADD 0 within the run-time group set in p20096.</td>
<td>0: Run-time group 0 1: Run-time group 1 2: Run-time group 2 3: Run-time group 3 4: Run-time group 4 5: Run-time group 5 6: Run-time group 6 7: Run-time group 7 8: Run-time group 8 9: Run-time group 9 9999: Do not calculate</td>
</tr>
</tbody>
</table>

#### p20098[0...3]
**Cl: ADD 1 inputs / ADD 1 inputs**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>p20098[0...3]Cl: ADD 1 inputs / ADD 1 inputs</td>
<td>Sets the signal source of input quantities X0, X1, X2, X3 of instance ADD 1 of the adder.</td>
<td>0: Input X0 1: Input X1 2: Input X2 3: Input X3</td>
</tr>
</tbody>
</table>
**Parameter**

**List of parameters**

### r20099

**CO: ADD 1 output Y / ADD 1 output Y**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed:</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Data type:</td>
<td>FloatingPoint32</td>
<td>Dynamic index:</td>
</tr>
<tr>
<td>P-Group:</td>
<td>-</td>
<td>Units group:</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
<td>Scaling: PERCENT</td>
</tr>
</tbody>
</table>

**CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)**

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Description:**
Display parameter for the output quantity \( Y = X_0 + X_1 + X_2 + X_3 \) of instance ADD 1 of the adder.

### p20100

**ADD 1 run-time group / ADD 1 RTG**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed:</td>
<td>T</td>
<td>-</td>
</tr>
<tr>
<td>Data type:</td>
<td>Integer16</td>
<td>Dynamic index:</td>
</tr>
<tr>
<td>P-Group:</td>
<td>-</td>
<td>Units group:</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
<td>Scaling:</td>
</tr>
</tbody>
</table>

**CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)**

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>9999</td>
<td>9999</td>
</tr>
</tbody>
</table>

**Description:**
Setting parameter for the run-time group in which the instance ADD 1 of the adder is to be called.

**Value:**
0: Run-time group 0
1: Run-time group 1
2: Run-time group 2
3: Run-time group 3
4: Run-time group 4
5: Run-time group 5
6: Run-time group 6
7: Run-time group 7
8: Run-time group 8
9: Run-time group 9
9999: Do not calculate

### p20101

**ADD 1 run sequence / ADD 1 RunSeq**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed:</td>
<td>T</td>
<td>-</td>
</tr>
<tr>
<td>Data type:</td>
<td>Unsigned16</td>
<td>Dynamic index:</td>
</tr>
<tr>
<td>P-Group:</td>
<td>-</td>
<td>Units group:</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
<td>Scaling:</td>
</tr>
</tbody>
</table>

**CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)**

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>32000</td>
<td>220</td>
</tr>
</tbody>
</table>

**Description:**
Setting parameter for the run sequence of instance ADD 1 within the run-time group set in p20100.

**Note:**
The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.
### p20102[0...1] CI: SUB 0 inputs / SUB 0 inputs

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CI: SUB 0 inputs / SUB 0 inputs</td>
<td>Can be changed: T</td>
<td>Calculated: -</td>
</tr>
<tr>
<td>Data type:</td>
<td>Unsigned32 / FloatingPoint32</td>
<td>Dynamic index: -</td>
</tr>
<tr>
<td>P-Group:</td>
<td></td>
<td>Units group: -</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td></td>
<td>Scaling: PERCENT</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
</tr>
<tr>
<td>-</td>
<td>-</td>
<td>0</td>
</tr>
</tbody>
</table>

**Index:**

- [0] = Minuend X1
- [1] = Subtrahend X2

**Description:**
Sets the signal source of minuend X1 and subtrahend X2 of instance SUB 0 of the subtractor.

### r20103 CO: SUB 0 difference Y / SUB 0 difference Y

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO: SUB 0 difference Y / SUB 0 difference Y</td>
<td>Can be changed: -</td>
<td>Calculated: -</td>
</tr>
<tr>
<td>Data type:</td>
<td>FloatingPoint32</td>
<td>Dynamic index: -</td>
</tr>
<tr>
<td>P-Group:</td>
<td></td>
<td>Units group: -</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td></td>
<td>Scaling: PERCENT</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
</tr>
<tr>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Description:**
Display parameter for the difference Y = X1 - X2 of instance SUB 0 of the subtractor.

### p20104 SUB 0 run-time group / SUB 0 RTG

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUB 0 run-time group / SUB 0 RTG</td>
<td>Can be changed: T</td>
<td>Calculated: -</td>
</tr>
<tr>
<td>Data type:</td>
<td>Integer16</td>
<td>Dynamic index: -</td>
</tr>
<tr>
<td>P-Group:</td>
<td></td>
<td>Units group: -</td>
</tr>
<tr>
<td>Not for motor type:</td>
<td></td>
<td>Scaling: -</td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
</tr>
<tr>
<td>0</td>
<td>9999</td>
<td>9999</td>
</tr>
</tbody>
</table>

**Description:**
Setting parameter for the run-time group in which instance SUB 0 of the subtractor is to be called.

**Value:**
- 0: Run-time group 0
- 1: Run-time group 1
- 2: Run-time group 2
- 3: Run-time group 3
- 4: Run-time group 4
- 5: Run-time group 5
- 6: Run-time group 6
- 7: Run-time group 7
- 8: Run-time group 8
- 9: Run-time group 9
- 9999: Do not calculate
**Parameter**

**List of parameters**

---

### p20105 SUB 0 run sequence / SUB 0 RunSeq

**Description:** Setting parameter for the run sequence of instance SUB 0 within the run-time group set in p20104.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

**CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)**

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>32000</td>
<td>240</td>
</tr>
</tbody>
</table>

---

### p20106[0...1] CI: SUB 1 inputs / SUB 1 inputs

**Description:** Sets the signal source of minuend X1 and subtrahend X2 of instance SUB 1 of the subtractor.

**Index:**
- [0] = Minuend X1
- [1] = Subtrahend X2

**CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)**

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>0</td>
</tr>
</tbody>
</table>

---

### r20107 CO: SUB 1 difference Y / SUB 1 difference Y

**Description:** Display parameter for the difference Y = X1 - X2 of instance SUB 1 of the subtractor.

**CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)**

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Parameter</td>
<td>Description</td>
<td>Value</td>
</tr>
<tr>
<td>------------</td>
<td>------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>p20108</td>
<td>Setting parameter for the run-time group in which instance SUB 1 of the subtractor is to be called.</td>
<td>0: Run-time group 0, 1: Run-time group 1, 2: Run-time group 2, 3: Run-time group 3, 4: Run-time group 4, 5: Run-time group 5, 6: Run-time group 6, 7: Run-time group 7, 8: Run-time group 8, 9: Run-time group 9, 9999: Do not calculate</td>
</tr>
<tr>
<td>p20109</td>
<td>Setting parameter for the run sequence of instance SUB 1 within the run-time group set in p20108.</td>
<td>0: Run-time group 0, 1: Run-time group 1, 2: Run-time group 2, 3: Run-time group 3, 4: Run-time group 4, 5: Run-time group 5, 6: Run-time group 6, 7: Run-time group 7, 8: Run-time group 8, 9: Run-time group 9, 9999: Do not calculate</td>
</tr>
<tr>
<td>p20110[0...3]</td>
<td>Sets the signal source of the factors X0, X1, X2, X3 of instance MUL 0 of the multiplier.</td>
<td>[0] = Factor X0, [1] = Factor X1, [2] = Factor X2, [3] = Factor X3</td>
</tr>
</tbody>
</table>
### r20111

**CO: MUL 0 product Y / MUL 0 product Y**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Access level</th>
<th>Data type</th>
<th>Dynamic index</th>
<th>Func. diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>r20111</td>
<td>Display parameter for the product Y = X0 * X1 * X2 * X3 of instance MUL 0 of the multiplier.</td>
<td></td>
<td></td>
<td>FloatingPoint32</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Setting parameter for the run-time group in which instance MUL 0 of the multiplier is to be called.</td>
<td></td>
<td></td>
<td>Integer16</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Setting parameter for the run sequence of instance MUL 0 within the run-time group set in p20112.</td>
<td></td>
<td></td>
<td>Unsigned16</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>9999</td>
<td>9999</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0: Run-time group 0</td>
</tr>
<tr>
<td></td>
<td>1: Run-time group 1</td>
</tr>
<tr>
<td></td>
<td>2: Run-time group 2</td>
</tr>
<tr>
<td></td>
<td>3: Run-time group 3</td>
</tr>
<tr>
<td></td>
<td>4: Run-time group 4</td>
</tr>
<tr>
<td></td>
<td>5: Run-time group 5</td>
</tr>
<tr>
<td></td>
<td>6: Run-time group 6</td>
</tr>
<tr>
<td></td>
<td>7: Run-time group 7</td>
</tr>
<tr>
<td></td>
<td>8: Run-time group 8</td>
</tr>
<tr>
<td></td>
<td>9: Run-time group 9</td>
</tr>
<tr>
<td></td>
<td>9999: Do not calculate</td>
</tr>
</tbody>
</table>

### p20112

**MUL 0 run-time group / MUL 0 RTG**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Access level</th>
<th>Data type</th>
<th>Dynamic index</th>
<th>Func. diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>p20112</td>
<td>Setting parameter for the run-time group in which instance MUL 0 of the multiplier is to be called.</td>
<td></td>
<td></td>
<td>Integer16</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>9999</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0: Run-time group 0</td>
</tr>
<tr>
<td></td>
<td>1: Run-time group 1</td>
</tr>
<tr>
<td></td>
<td>2: Run-time group 2</td>
</tr>
<tr>
<td></td>
<td>3: Run-time group 3</td>
</tr>
<tr>
<td></td>
<td>4: Run-time group 4</td>
</tr>
<tr>
<td></td>
<td>5: Run-time group 5</td>
</tr>
<tr>
<td></td>
<td>6: Run-time group 6</td>
</tr>
<tr>
<td></td>
<td>7: Run-time group 7</td>
</tr>
<tr>
<td></td>
<td>8: Run-time group 8</td>
</tr>
<tr>
<td></td>
<td>9: Run-time group 9</td>
</tr>
<tr>
<td></td>
<td>9999: Do not calculate</td>
</tr>
</tbody>
</table>

### p20113

**MUL 0 run sequence / MUL 0 RunSeq**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Access level</th>
<th>Data type</th>
<th>Dynamic index</th>
<th>Func. diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>p20113</td>
<td>Setting parameter for the run sequence of instance MUL 0 within the run-time group set in p20112.</td>
<td></td>
<td></td>
<td>Unsigned16</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>32000</td>
<td>270</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.</td>
</tr>
</tbody>
</table>
### List of parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Index</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Description: Sets the signal source of the factors X0, X1, X2, X3 of instance MUL 1 of the multiplier.</td>
<td></td>
</tr>
<tr>
<td>r20115</td>
<td>Can be changed: -</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Description: Display parameter for the product Y = X0 * X1 * X2 * X3 of instance MUL 1 of the multiplier.</td>
<td></td>
</tr>
<tr>
<td>p20116</td>
<td>Can be changed: T</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Description: Setting parameter for the run-time group in which instance MUL 1 of the multiplier is to be called.</td>
<td></td>
</tr>
</tbody>
</table>

#### p20114[0...3]

- **CI: MUL 1 inputs / MUL 1 inputs**
  - **Data type:** Unsigned32 / FloatingPoint32
  - **P-Group:** -
  - **Not for motor type:** -

<table>
<thead>
<tr>
<th>Description</th>
<th>Index</th>
</tr>
</thead>
</table>

#### r20115

- **CO: MUL 1 product Y / MUL 1 product Y**
  - **Data type:** FloatingPoint32
  - **P-Group:** -
  - **Not for motor type:** -

<table>
<thead>
<tr>
<th>Description</th>
<th>Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display parameter for the product Y = X0 * X1 * X2 * X3 of instance MUL 1 of the multiplier.</td>
<td></td>
</tr>
</tbody>
</table>

#### p20116

- **MUL 1 run-time group / MUL 1 RTG**
  - **Data type:** Integer16
  - **P-Group:** -
  - **Not for motor type:** -

<table>
<thead>
<tr>
<th>Description</th>
<th>Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Setting parameter for the run-time group in which instance MUL 1 of the multiplier is to be called.</td>
<td></td>
</tr>
</tbody>
</table>

### Additional Information

- **Value:**
  - **0:** Run-time group 0
  - **1:** Run-time group 1
  - **2:** Run-time group 2
  - **3:** Run-time group 3
  - **4:** Run-time group 4
  - **5:** Run-time group 5
  - **6:** Run-time group 6
  - **7:** Run-time group 7
  - **8:** Run-time group 8
  - **9:** Run-time group 9
  - **999:** Do not calculate
p20117  MUL 1 run sequence / MUL 1 RunSeq

CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)

Description: Setting parameter for the run sequence of instance MUL 1 within the run-time group set in p20116.

Note: The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

Can be changed: T  Calculated: -  Access level: 1
Data type: Unsigned16  Dynamic index: -  Func. diagram: 7222
P-Group: -  Units group: -  Unit selection: -
Not for motor type: -  Scaling: -  Expert list: 1

Min 0  Max 32000  Factory setting 280

p20118[0...1]  CI: DIV 0 inputs / DIV 0 inputs

CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)

Description: Sets the signal source of dividend X1 and divisor X2 of instance DIV 0 of the divider.

Can be changed: T  Calculated: -  Access level: 1
Data type: Unsigned32 / FloatingPoint32  Dynamic index: -  Func. diagram: 7222
P-Group: -  Units group: -  Unit selection: -
Not for motor type: -  Scaling: PERCENT  Expert list: 1

Min -  Max -  Factory setting 0

Index:
[0] = Dividend X0
[1] = Divisor X1

r20119[0...2]  CO: DIV 0 quotient / DIV 0 quotient

CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)

Description: Display parameter for quotients Y = X1/X2, integer number quotients YIN, and division remainder MOD = (Y - YIN) x X2 of instance DIV 0 of the divider.

Can be changed: -  Calculated: -  Access level: 1
Data type: FloatingPoint32  Dynamic index: -  Func. diagram: 7222
P-Group: -  Units group: -  Unit selection: -
Not for motor type: -  Scaling: PERCENT  Expert list: 1

Min -  Max -  Factory setting -

Index:
[0] = Quotient Y
[1] = Integer number quotient YIN
[2] = Div remainder MOD
### r20120

**BO: DIV 0 divisor is zero QF / DIV 0 divisor=0 QF**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>

**Data type:** Unsigned32  
**Dynamic index:** -  
**Units group:** -  
**Scaling:** -  
**Expert list:** 1

**Description:**  
Display parameter for the signal QF that the divisor X2 of instance DIV 0 of the divider is zero.  
X2 = 0.0 => QF = 1

**CU_S110-CAN,**  
**CU_S110-DP,**  
**CU_S110-PN,**  
**SERVO_S110-CAN (FBLOCKS),**  
**SERVO_S110-DP (FBLOCKS),**  
**SERVO_S110-PN (FBLOCKS)**

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

### p20121

**DIV 0 run-time group / DIV 0 RTG**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>T</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>

**Data type:** Integer16  
**Dynamic index:** -  
**Units group:** -  
**Scaling:** -  
**Expert list:** 1

**P-Group:**  
**Unit selection:** -

**Description:**  
Setting parameter for the run-time group in which instance DIV 0 of the divider is to be called.

<table>
<thead>
<tr>
<th>Value</th>
<th>Run-time group</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Run-time group 0</td>
</tr>
<tr>
<td>1</td>
<td>Run-time group 1</td>
</tr>
<tr>
<td>2</td>
<td>Run-time group 2</td>
</tr>
<tr>
<td>3</td>
<td>Run-time group 3</td>
</tr>
<tr>
<td>4</td>
<td>Run-time group 4</td>
</tr>
<tr>
<td>5</td>
<td>Run-time group 5</td>
</tr>
<tr>
<td>6</td>
<td>Run-time group 6</td>
</tr>
<tr>
<td>7</td>
<td>Run-time group 7</td>
</tr>
<tr>
<td>8</td>
<td>Run-time group 8</td>
</tr>
<tr>
<td>9</td>
<td>Run-time group 9</td>
</tr>
<tr>
<td>9999</td>
<td>Do not calculate</td>
</tr>
</tbody>
</table>

**CU_S110-CAN,**  
**CU_S110-DP,**  
**CU_S110-PN,**  
**SERVO_S110-CAN (FBLOCKS),**  
**SERVO_S110-DP (FBLOCKS),**  
**SERVO_S110-PN (FBLOCKS)**

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>9999</td>
<td>9999</td>
</tr>
</tbody>
</table>

### p20122

**DIV 0 run sequence / DIV 0 RunSeq**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>T</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>

**Data type:** Unsigned16  
**Dynamic index:** -  
**Units group:** -  
**Scaling:** -  
**Expert list:** 1

**P-Group:**  
**Unit selection:** -

**Description:**  
Setting parameter for the run sequence of instance DIV 0 within the run-time group set in p20121.

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>32000</td>
<td>300</td>
</tr>
</tbody>
</table>

**Note:**  
The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

**CU_S110-CAN,**  
**CU_S110-DP,**  
**CU_S110-PN,**  
**SERVO_S110-CAN (FBLOCKS),**  
**SERVO_S110-DP (FBLOCKS),**  
**SERVO_S110-PN (FBLOCKS)**
### Parameter List of parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Index</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>p20123[0...1]</strong></td>
<td>CI: DIV 1 inputs / DIV 1 inputs</td>
<td>Sets the signal source of dividend X1 and divisor X2 of instance DIV 1 of the divider.</td>
<td>[0] = Dividend X0</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[1] = Divisor X1</td>
<td>-</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Can be changed: T</td>
<td>Calculated: -</td>
<td>Access level: 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Data type: Unsigned32 / FloatingPoint32</td>
<td>Dynamic index: -</td>
<td>Func. diagram: 7222</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P-Group: -</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not for motor type: -</td>
<td>Scaling: PERCENT</td>
<td>Expert list: 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>r20124[0...2]</strong></td>
<td>CO: DIV 1 quotient / DIV 1 quotient</td>
<td>Display parameter for quotients Y = X1/X2, integer number quotients YIN, and division remainder MOD = (Y - YIN) ( \times ) X2 of instance DIV 1 of the divider.</td>
<td>[0] = Quotient Y</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[1] = Integer number quotient YIN</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[2] = Div remainder MOD</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Can be changed: -</td>
<td>Calculated: -</td>
<td>Access level: 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Data type: FloatingPoint32</td>
<td>Dynamic index: -</td>
<td>Func. diagram: 7222</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P-Group: -</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not for motor type: -</td>
<td>Scaling: PERCENT</td>
<td>Expert list: 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>r20125</strong></td>
<td>BO: DIV 1 divisor is zero QF / DIV 1 divisor=0 QF</td>
<td>Display parameter for the signal QF that the divisor X2 of instance DIV 1 of the divider is zero. X2 ( \neq 0 ) ( \Rightarrow ) QF = 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Can be changed: -</td>
<td>Calculated: -</td>
<td>Access level: 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Data type: Unsigned32</td>
<td>Dynamic index: -</td>
<td>Func. diagram: 7222</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P-Group: -</td>
<td>Units group: -</td>
<td>Unit selection: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>Expert list: 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
List of parameters

**p20126**

**DIV 1 run-time group / DIV 1 RTG**

<table>
<thead>
<tr>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
<th>CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>T</td>
<td>-</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**Data type:** Integer16  
**Dynamic index:** -  
**Units group:** -  
**Scaling:** -  
**P-Group:** -  
**Not for motor type:** -  

**Description:** Setting parameter for the run-time group in which instance DIV 1 of the divider is to be called.

**Value:**

- 0: Run-time group 0
- 1: Run-time group 1
- 2: Run-time group 2
- 3: Run-time group 3
- 4: Run-time group 4
- 5: Run-time group 5
- 6: Run-time group 6
- 7: Run-time group 7
- 8: Run-time group 8
- 9: Run-time group 9
- 9999: Do not calculate

**Min Max Factory setting**

0 9999 9999

**p20127**

**DIV 1 run sequence / DIV 1 RunSeq**

<table>
<thead>
<tr>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
<th>CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>T</td>
<td>-</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**Data type:** Unsigned16  
**Dynamic index:** -  
**Units group:** -  
**Scaling:** -  
**P-Group:** -  
**Not for motor type:** -  

**Description:** Setting parameter for the run sequence of instance DIV 1 within the run-time group set in p20126.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

**Min Max Factory setting**

0 32000 310

**p20128**

**CI: AVA 0 input X / AVA 0 input X**

<table>
<thead>
<tr>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
<th>CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>T</td>
<td>-</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**Data type:** Unsigned32 / FloatingPoint32  
**Dynamic index:** -  
**Units group:** -  
**Scaling:** PERCENT  
**P-Group:** -  
**Not for motor type:** -  

**Description:** Sets the signal source of the input quantity X of instance AVA 0 of the absolute value generator with sign evaluation.
### Parameter List of parameters

#### r20129

<table>
<thead>
<tr>
<th>CO: AVA 0 output Y / AVA 0 output Y</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CU_S110-CAN,</strong></td>
</tr>
<tr>
<td><strong>CU_S110-DP,</strong></td>
</tr>
<tr>
<td><strong>CU_S110-PN,</strong></td>
</tr>
<tr>
<td><strong>SERVO_S110-CAN</strong> (FBLOCKS),</td>
</tr>
<tr>
<td><strong>SERVO_S110-DP</strong> (FBLOCKS),</td>
</tr>
<tr>
<td><strong>SERVO_S110-PN</strong> (FBLOCKS)</td>
</tr>
</tbody>
</table>

**Can be changed:** -  
**Data type:** FloatingPoint32  
**P-Group:** -  
**Not for motor type:** -  
**Calculated:** -  
**Dynamic index:** -  
**Units group:** -  
**Scaling:** PERCENT  
**Expert list:** 1  
**Access level:** 1  
**Func. diagram:** 7224  

**Description:**  
Display parameter for output quantity Y of instance AVA 0 of the absolute value generator with sign evaluation.

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>-</td>
</tr>
</tbody>
</table>

#### r20130

<table>
<thead>
<tr>
<th>BO: AVA 0 input negative SN / AVA 0 input neg SN</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CU_S110-CAN,</strong></td>
</tr>
<tr>
<td><strong>CU_S110-DP,</strong></td>
</tr>
<tr>
<td><strong>CU_S110-PN,</strong></td>
</tr>
<tr>
<td><strong>SERVO_S110-CAN</strong> (FBLOCKS),</td>
</tr>
<tr>
<td><strong>SERVO_S110-DP</strong> (FBLOCKS),</td>
</tr>
<tr>
<td><strong>SERVO_S110-PN</strong> (FBLOCKS)</td>
</tr>
</tbody>
</table>

**Can be changed:** -  
**Data type:** Unsigned32  
**P-Group:** -  
**Not for motor type:** -  
**Calculated:** -  
**Dynamic index:** -  
**Units group:** -  
**Scaling:** -  
**Expert list:** 1  
**Access level:** 1  
**Func. diagram:** 7224  

**Description:**  
Display parameter for signal SN that the input quantity X of instance AVA 0 of the absolute value generator with sign evaluation is negative.  
\[ X < 0.0 => SN = 1 \]

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>-</td>
</tr>
</tbody>
</table>

#### p20131

<table>
<thead>
<tr>
<th>AVA 0 run-time group / AVA 0 RTG</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CU_S110-CAN,</strong></td>
</tr>
<tr>
<td><strong>CU_S110-DP,</strong></td>
</tr>
<tr>
<td><strong>CU_S110-PN,</strong></td>
</tr>
<tr>
<td><strong>SERVO_S110-CAN</strong> (FBLOCKS),</td>
</tr>
<tr>
<td><strong>SERVO_S110-DP</strong> (FBLOCKS),</td>
</tr>
<tr>
<td><strong>SERVO_S110-PN</strong> (FBLOCKS)</td>
</tr>
</tbody>
</table>

**Can be changed:** T  
**Data type:** Integer16  
**P-Group:** -  
**Not for motor type:** -  
**Calculated:** -  
**Dynamic index:** -  
**Units group:** -  
**Scaling:** -  
**Expert list:** 1  
**Access level:** 1  
**Func. diagram:** 7224  

**Description:**  
Setting parameter for the run-time group in which instance AVA 0 of the absolute value generator with sign evaluation is to be called.

<table>
<thead>
<tr>
<th>Value</th>
</tr>
</thead>
</table>
| 0: Run-time group 0  
| 1: Run-time group 1  
| 2: Run-time group 2  
| 3: Run-time group 3  
| 4: Run-time group 4  
| 5: Run-time group 5  
| 6: Run-time group 6  
| 7: Run-time group 7  
| 8: Run-time group 8  
| 9: Run-time group 9  
| 9999: Do not calculate  

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>9999</td>
<td>9999</td>
</tr>
</tbody>
</table>
### List of parameters

#### p20132
**AVA 0 run sequence / AVA 0 RunSeq**

- **Can be changed:** T
- **Data type:** Unsigned16
- **P-Group:** -
- **Not for motor type:** -

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>32000</td>
<td>340</td>
</tr>
</tbody>
</table>

**Description:** Setting parameter for the run sequence of instance AVA 0 within the run-time group set in p20131.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

- **Access level:** 1
- **Func. diagram:** 7224
- **Unit selection:** -
- **Expert list:** 1

#### p20133
**CI: AVA 1 input X / AVA 1 input X**

- **Can be changed:** T
- **Data type:** Unsigned32 / FloatingPoint32
- **P-Group:** -
- **Not for motor type:** -

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>0</td>
</tr>
</tbody>
</table>

**Description:** Sets the signal source of the input quantity X of instance AVA 1 of the absolute value generator with sign evaluation.

- **Access level:** 1
- **Func. diagram:** 7224
- **Unit selection:** -
- **Expert list:** 1

#### r20134
**CO: AVA 1 output Y / AVA 1 output Y**

- **Can be changed:** -
- **Data type:** FloatingPoint32
- **P-Group:** -
- **Not for motor type:** -

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Description:** Display parameter for output quantity Y of instance AVA 1 of the absolute value generator with sign evaluation.

- **Access level:** 1
- **Func. diagram:** 7224
- **Unit selection:** -
- **Expert list:** 1
### r20135
**BO: A VA 1 input negative SN / A VA 1 input neg SN**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Can be changed</th>
<th>Calculated</th>
<th>Access level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Data type</td>
<td>Unsigned32</td>
<td>dynamic</td>
<td>-</td>
</tr>
<tr>
<td>P-Group</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Not for motor type</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Description:**
Display parameter for signal SN that the input quantity X of instance AVA 1 of the absolute value generator with sign evaluation is negative.
X < 0.0 => SN = 1

### p20136
**AVA 1 run-time group / A VA 1 RTG**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Can be changed</th>
<th>Calculated</th>
<th>Access level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>T</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Data type</td>
<td>Integer16</td>
<td>dynamic</td>
<td>-</td>
</tr>
<tr>
<td>P-Group</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Not for motor type</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>9999</td>
<td>9999</td>
</tr>
</tbody>
</table>

**Description:**
Setting parameter for the run-time group in which instance AVA 1 of the absolute value generator with sign evaluation is to be called.

**Value:**
- 0: Run-time group 0
- 1: Run-time group 1
- 2: Run-time group 2
- 3: Run-time group 3
- 4: Run-time group 4
- 5: Run-time group 5
- 6: Run-time group 6
- 7: Run-time group 7
- 8: Run-time group 8
- 9: Run-time group 9
- 9999: Do not calculate

### p20137
**AVA 1 run sequence / A VA 1 RunSeq**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Can be changed</th>
<th>Calculated</th>
<th>Access level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>T</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Data type</td>
<td>Unsigned16</td>
<td>dynamic</td>
<td>-</td>
</tr>
<tr>
<td>P-Group</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Not for motor type</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>32000</td>
<td>350</td>
</tr>
</tbody>
</table>

**Description:**
Setting parameter for the run sequence of instance AVA 1 within the run-time group set in p20136.

**Note:**
The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.
## List of parameters

### p20138

**Description:** Sets the signal source for the input pulse I of instance MFP 0 of the pulse generator.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Access level</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>BI: MFP 0 input pulse I / MFP 0 inp_pulse I</td>
<td>Can be changed: T, Data type: Unsigned32 / Binary, Not for motor type: -</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Min</td>
<td>Max</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>-</td>
<td>0</td>
</tr>
</tbody>
</table>

### p20139

**Description:** Setting parameter for pulse duration T in milliseconds of instance MFP 0 of the pulse generator.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Access level</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>MFP 0 pulse duration in ms / MFP 0 pulse_dur ms</td>
<td>Can be changed: T, Data type: FloatingPoint32, Not for motor type: -</td>
<td>1</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>Min</td>
<td>Max</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.00</td>
<td>60000.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>

### r20140

**Description:** Display parameter for output pulse Q of instance MFP 0 of the pulse generator.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Access level</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>BO: MFP 0 output Q / MFP 0 output Q</td>
<td>Can be changed: -, Data type: Unsigned32, P-Group: -, Not for motor type: -</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Min</td>
<td>Max</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

### p20141

**Description:** Setting parameter for the run-time group in which the instance MFP 0 of the pulse generator is to be called.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Access level</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>MFP 0 run-time group / MFP 0 RTG</td>
<td>Can be changed: T, Data type: Integer16, Not for motor type: -</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Min</td>
<td>Max</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>9999</td>
<td>9999</td>
</tr>
</tbody>
</table>

**Value:**
- 0: Run-time group 0
- 1: Run-time group 1
- 2: Run-time group 2
### Description:
Setting parameter for the run sequence of instance MFP 0 within the run-time group set in p20141.

### Note:
The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

### p20143
**BI: MFP 1 input pulse I / MFP 1 inp_pulse I**

- **Can be changed:** Yes
- **Data type:** Unsigned32 / Binary
- **P-Group:** -
- **Not for motor type:** -

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Description:**
Sets the signal source for the input pulse I of instance MFP 1 of the pulse generator.

### p20144
**MFP 1 pulse duration in ms / MFP 1 pulse_dur ms**

- **Can be changed:** Yes
- **Data type:** FloatingPoint32
- **P-Group:** -
- **Not for motor type:** -

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.00</td>
<td>60000.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>

**Description:**
Setting parameter for pulse duration T in milliseconds of instance MFP 1 of the pulse generator.
### List of parameters

#### Parameter r20145

**BO: MFP 1 output Q / MFP 1 output Q**

- **CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>p20146 MFP 1 run-time group / MFP 1 RTG</td>
<td>Setting parameter for the run-time group in which the instance MFP 1 of the pulse generator is to be called.</td>
<td>0: Run-time group 0, 1: Run-time group 1, 2: Run-time group 2, 3: Run-time group 3, 4: Run-time group 4, 5: Run-time group 5, 6: Run-time group 6, 7: Run-time group 7, 8: Run-time group 8, 9: Run-time group 9, 9999: Do not calculate</td>
</tr>
<tr>
<td>p20147 MFP 1 run sequence / MFP 1 RunSeq</td>
<td>Setting parameter for the run sequence of instance MFP 1 within the run-time group set in p20146.</td>
<td>0: Run-time group 0, 1: Run-time group 1, 2: Run-time group 2, 3: Run-time group 3, 4: Run-time group 4, 5: Run-time group 5, 6: Run-time group 6, 7: Run-time group 7, 8: Run-time group 8, 9: Run-time group 9, 9999: Do not calculate</td>
</tr>
</tbody>
</table>

**Min** | **Max** | **Factory setting** |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>9999</td>
<td>9999</td>
</tr>
<tr>
<td>0</td>
<td>32000</td>
<td>380</td>
</tr>
</tbody>
</table>

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SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3
## List of parameters

### p20148  
**BI: PCL 0 input pulse I / PCL 0 inp_pulse I**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p20148</td>
<td>Sets the signal source for the input pulse I of instance PCL 0 of the pulse shortener.</td>
<td>-</td>
<td>-</td>
<td>0</td>
</tr>
</tbody>
</table>

**CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)**

**Value:**

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Run-time group 0</td>
</tr>
<tr>
<td>1</td>
<td>Run-time group 1</td>
</tr>
<tr>
<td>2</td>
<td>Run-time group 2</td>
</tr>
</tbody>
</table>

**CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)**

**CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)**

**CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)**

**CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)**

### p20149  
**PCL 0 pulse duration in ms / PCL 0 pulse_dur ms**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p20149</td>
<td>Setting parameter for pulse duration T in milliseconds of instance PCL 0 of the pulse shortener.</td>
<td>0.00</td>
<td>60000.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>

**CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)**

**CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)**

**CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)**

### r20150  
**BO: PCL 0 output Q / PCL 0 output Q**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>BO</td>
<td>Display parameter for output pulse Q of instance PCL 0 of the pulse shortener.</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)**

**CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)**

### p20151  
**PCL 0 run-time group / PCL 0 RTG**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p20151</td>
<td>Setting parameter for the run-time group in which the instance PCL 0 of the pulse shortener is to be called.</td>
<td>0</td>
<td>9999</td>
<td>9999</td>
</tr>
</tbody>
</table>

**CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)**

**CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)**

**CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)**

**CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)**

**CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)**
### List of parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p20152</td>
<td><strong>PCL 0 run sequence / PCL 0 RunSeq</strong></td>
<td>Setting parameter for the run sequence of instance PCL 0 within the run-time group set in p20151. The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.</td>
</tr>
<tr>
<td>p20153</td>
<td><strong>BI: PCL 1 input pulse I / PCL 1 inp_pulse I</strong></td>
<td>Sets the signal source for the input pulse I of instance PCL 1 of the pulse shortener.</td>
</tr>
<tr>
<td>p20154</td>
<td><strong>PCL 1 pulse duration in ms / PCL 1 pulse_dur ms</strong></td>
<td>Setting parameter for pulse duration T in milliseconds of instance PCL 1 of the pulse shortener.</td>
</tr>
</tbody>
</table>

#### p20152

**CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)**

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>32000</td>
<td>400</td>
</tr>
</tbody>
</table>

#### p20153

**CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)**

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>0</td>
</tr>
</tbody>
</table>

#### p20154

**CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)**

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.00</td>
<td>60000.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>
### r20155
**BO: PCL 1 output Q / PCL 1 output Q**

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
</table>

**Description:**
Display parameter for output pulse Q of instance PCL 1 of the pulse shortener.

**Value:**
- Can be changed: -
- Calculated: -
- Access level: 1
- Data type: Unsigned32
- Dynamic index: -
- Units group: -
- Unit selection: -
- Not for motor type: -
- Scaling: -
- Expert list: 1

### p20156
**PCL 1 run-time group / PCL 1 RTG**

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
</table>

**Description:**
Setting parameter for the run-time group in which the instance PCL 1 of the pulse shortener is to be called.

**Value:**
- Can be changed: T
- Calculated: -
- Access level: 1
- Data type: Integer16
- Dynamic index: -
- Units group: -
- Unit selection: -
- Not for motor type: -
- Scaling: -
- Expert list: 1

### p20157
**PCL 1 run sequence / PCL 1 RunSeq**

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
</table>

**Description:**
Setting parameter for the run sequence of instance PCL 1 within the run-time group set in p20156.

**Value:**
- Can be changed: T
- Calculated: -
- Access level: 1
- Data type: Unsigned16
- Dynamic index: -
- Units group: -
- Unit selection: -
- Not for motor type: -
- Scaling: -
- Expert list: 1

**Note:**
The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.
### p20158
- **BI: PDE 0 input pulse I / PDE 0 inp_pulse I**
- **Description:** Sets the signal source for the input pulse I of instance PDE 0 of the closing delay device.
- **Value:**
  - Min: -
  - Max: -
  - Factory setting: 0

### p20159
- **PDE 0 pulse delay time in ms / PDE 0 t_del ms**
- **Description:** Setting parameter for pulse delay time T in milliseconds of instance PDE 0 of the closing delay device.
- **Value:**
  - Min: 0.00
  - Max: 60000.00
  - Factory setting: 0.00

### r20160
- **BO: PDE 0 output Q / PDE 0 output Q**
- **Description:** Display parameter for output pulse Q of instance PDE 0 of the closing delay device.
- **Value:**
  - Min: -
  - Max: -
  - Factory setting: -

### p20161
- **PDE 0 run-time group / PDE 0 RTG**
- **Description:** Setting parameter for the run-time group in which instance PDE 0 of the closing delay device is to be called.
- **Value:**
  - 0: Run-time group 0
  - 1: Run-time group 1
  - 2: Run-time group 2
- **Value:**
  - Min: 0
  - Max: 9999
  - Factory setting: 9999
### Parameter List of parameters

<table>
<thead>
<tr>
<th>Run-time group</th>
<th>Description</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Run-time group 3</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Run-time group 4</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Run-time group 5</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Run-time group 6</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Run-time group 7</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Run-time group 8</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Run-time group 9</td>
<td></td>
</tr>
<tr>
<td>9999</td>
<td>Do not calculate</td>
<td></td>
</tr>
</tbody>
</table>

#### p20162 PDE run sequence / PDE 0 RunSeq

<table>
<thead>
<tr>
<th>CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed: T</td>
</tr>
<tr>
<td>Data type: Unsigned16</td>
</tr>
<tr>
<td>P-Group: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>32000</td>
<td>430</td>
</tr>
</tbody>
</table>

**Description:** Setting parameter for the run sequence of instance PDE 0 within the run-time group set in p20161.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

#### p20163 BI: PDE 1 input pulse I / PDE 1 inp_pulse I

<table>
<thead>
<tr>
<th>CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed: T</td>
</tr>
<tr>
<td>Data type: Unsigned32 / Binary</td>
</tr>
<tr>
<td>P-Group: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>0</td>
</tr>
</tbody>
</table>

**Description:** Sets the signal source for the input pulse I of instance PDE 1 of the closing delay device.

#### p20164 PDE 1 pulse delay time in ms / PDE 1 t_del ms

<table>
<thead>
<tr>
<th>CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed: T</td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
</tr>
<tr>
<td>P-Group: -</td>
</tr>
<tr>
<td>Not for motor type: -</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.00</td>
<td>60000.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>

**Description:** Setting parameter for pulse delay time T in milliseconds of instance PDE 1 of the closing delay device.
### Parameter List

#### r20165
**BO: PDE 1 output Q / PDE 1 output Q**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Access level</th>
<th>Data type</th>
<th>Dynamic index</th>
<th>Units group</th>
<th>Unit selection</th>
<th>Expert list</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed:</td>
<td>Display parameter for output pulse Q of instance PDE 1 of the closing delay device.</td>
<td></td>
<td>1</td>
<td>Unsigned32</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Calculated:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access level:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dynamic index:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Units group:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unit selection:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expert list:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td></td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max</td>
<td></td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factory setting</td>
<td></td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)**

#### p20166
**PDE 1 run-time group / PDE 1 RTG**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Access level</th>
<th>Data type</th>
<th>Dynamic index</th>
<th>Units group</th>
<th>Unit selection</th>
<th>Expert list</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed:</td>
<td>Setting parameter for the run-time group in which instance PDE 1 of the closing delay device is to be called.</td>
<td></td>
<td>1</td>
<td>Integer16</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Calculated:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access level:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dynamic index:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Units group:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unit selection:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expert list:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max</td>
<td>9999</td>
<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Factory setting</td>
<td>0</td>
<td>9999</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)**

#### p20167
**PDE 1 run sequence / PDE 1 RunSeq**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Access level</th>
<th>Data type</th>
<th>Dynamic index</th>
<th>Units group</th>
<th>Unit selection</th>
<th>Expert list</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed:</td>
<td>Setting parameter for the run sequence of instance PDE 1 within the run-time group set in p20166.</td>
<td></td>
<td>1</td>
<td>Unsigned16</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Calculated:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access level:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dynamic index:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Units group:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unit selection:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expert list:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max</td>
<td>32000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factory setting</td>
<td>32000</td>
<td>440</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)**

**Note:**
The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.
**Parameter**

**List of parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>p20168</td>
<td>BI: PDF 0 input pulse I / PDF 0 inp_pulse I</td>
<td>Sets the signal source for the input pulse I of instance PDF 0 of the breaking delay device.</td>
<td></td>
</tr>
<tr>
<td>p20169</td>
<td>PDF 0 pulse extension time in ms / PDF 0 t_ext ms</td>
<td>Setting parameter for pulse extension time T in milliseconds of instance PDF 0 of the breaking delay device.</td>
<td></td>
</tr>
<tr>
<td>r20170</td>
<td>BO: PDF 0 output Q / PDF 0 output Q</td>
<td>Display parameter for output pulse Q of instance PDF 0 of the breaking delay device.</td>
<td></td>
</tr>
<tr>
<td>p20171</td>
<td>PDF 0 run-time group / PDF 0 RTG</td>
<td>Setting parameter for the run-time group in which the instance PDF 0 of the breaking delay device is to be called.</td>
<td></td>
</tr>
</tbody>
</table>
### List of parameters

#### Parameter: 3 - Run-time group 3
#### Parameter: 4 - Run-time group 4
#### Parameter: 5 - Run-time group 5
#### Parameter: 6 - Run-time group 6
#### Parameter: 7 - Run-time group 7
#### Parameter: 8 - Run-time group 8
#### Parameter: 9 - Run-time group 9
#### Parameter: 9999 - Do not calculate

---

**p20172**  
**PDF 0 run sequence / PDF 0 RunSeq**

<table>
<thead>
<tr>
<th>Description</th>
<th>Setting parameter for the run sequence of instance PDF 0 within the run-time group set in p20171.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Note</td>
<td>The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.</td>
</tr>
</tbody>
</table>

**Min** 0  
**Max** 32000  
**Factory setting** 460

---

**p20173**  
**BI: PDF 1 input pulse I / PDF 1 inp_pulse I**

| Description | Sets the signal source for the input pulse I of instance PDF 1 of the breaking delay device. |

**Min** -  
**Max** 0  
**Factory setting** 0

---

**p20174**  
**PDF 1 pulse extension time in ms / PDF 1 t_ext ms**

| Description | Setting parameter for pulse extension time T in milliseconds of instance PDF 1 of the breaking delay device. |

**Min** 0.00  
**Max** 60000.00  
**Factory setting** 0.00
### r20175

**BO: PDF 1 output Q / PDF 1 output Q**

<table>
<thead>
<tr>
<th>CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)</th>
</tr>
</thead>
</table>

**Description:** Display parameter for output pulse Q of instance PDF 1 of the breaking delay device.

- **Can be changed:** -
- **Data type:** Unsigned32
- **P-Group:** -
- **Not for motor type:** -
- **Min:** -
- **Max:** -
- **Factory setting:** -

**Value:**
- **0:** Run-time group 0
- **1:** Run-time group 1
- **2:** Run-time group 2
- **3:** Run-time group 3
- **4:** Run-time group 4
- **5:** Run-time group 5
- **6:** Run-time group 6
- **7:** Run-time group 7
- **8:** Run-time group 8
- **9:** Run-time group 9
- **999:** Do not calculate

**Not for motor type:**
- **0:** Run-time group 0
- **1:** Run-time group 1
- **2:** Run-time group 2
- **3:** Run-time group 3
- **4:** Run-time group 4
- **5:** Run-time group 5
- **6:** Run-time group 6
- **7:** Run-time group 7
- **8:** Run-time group 8
- **9:** Run-time group 9
- **999:** Do not calculate

**Access level:** 1

**Data type:** Unsigned32

**Dynamic index:** -

**Units group:** -

**Expert list:** 1

### p20176

**PDF 1 run-time group / PDF 1 RTG**

<table>
<thead>
<tr>
<th>CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)</th>
</tr>
</thead>
</table>

**Description:** Setting parameter for the run-time group in which the instance PDF 1 of the breaking delay device is to be called.

**Can be changed:**
- **T**

**Data type:** Integer16

**P-Group:** -

**Not for motor type:** -

**Min:** 0

**Max:** 9999

**Factory setting:** 9999

**Value:**
- **0:** Run-time group 0
- **1:** Run-time group 1
- **2:** Run-time group 2
- **3:** Run-time group 3
- **4:** Run-time group 4
- **5:** Run-time group 5
- **6:** Run-time group 6
- **7:** Run-time group 7
- **8:** Run-time group 8
- **9:** Run-time group 9
- **999:** Do not calculate

**Access level:** 1

**Data type:** Integer16

**Dynamic index:** -

**Units group:** -

**Expert list:** 1

### p20177

**PDF 1 run sequence / PDF 1 RunSeq**

<table>
<thead>
<tr>
<th>CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)</th>
</tr>
</thead>
</table>

**Description:** Setting parameter for the run sequence of instance PDF 1 within the run-time group set in p20176.

**Can be changed:**
- **T**

**Data type:** Unsigned16

**P-Group:** -

**Not for motor type:** -

**Min:** 0

**Max:** 32000

**Factory setting:** 470

**Value:**
- **0:** Run-time group 0
- **1:** Run-time group 1
- **2:** Run-time group 2
- **3:** Run-time group 3
- **4:** Run-time group 4
- **5:** Run-time group 5
- **6:** Run-time group 6
- **7:** Run-time group 7
- **8:** Run-time group 8
- **9:** Run-time group 9
- **999:** Do not calculate

**Access level:** 1

**Data type:** Unsigned16

**Dynamic index:** -

**Units group:** -

**Expert list:** 1

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.
### List of parameters

#### p20178[0...1]
**BI: PST 0 inputs / PST 0 inputs**

- **Parameter**: p20178[0...1]
- **Description**: Sets the signal source for input pulse I and the reset input R of instance PST 0 of the pulse extension element.
- **Index**:
  - [0] = Input pulse I
  - [1] = Reset input R
- **CU values**: CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)
- **Can be changed**: T
- **Data type**: Unsigned32 / Binary
- **P-Group**: -
- **Not for motor type**: -
- **Calculated**: -
- **Dynamic index**: -
- **Units group**: -
- **Scaling**: -
- **Access level**: 1
- **Func. diagram**: 7234
- **Expert list**: 1
- **Factory setting**: 0

#### p20179
**PST 0 pulse duration in ms / PST 0 pulse_dur ms**

- **Parameter**: p20179
- **Description**: Setting parameter for pulse duration T in milliseconds of instance PST 0 of the pulse extension element.
- **CU values**: CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)
- **Can be changed**: T
- **Data type**: FloatingPoint32
- **P-Group**: -
- **Not for motor type**: -
- **Calculated**: -
- **Dynamic index**: -
- **Units group**: -
- **Scaling**: -
- **Access level**: 1
- **Func. diagram**: 7234
- **Expert list**: 1
- **Factory setting**: 600.00
- **Min**: 0.00
- **Max**: 60000.00

#### r20180
**BO: PST 0 output Q / PST 0 output Q**

- **Parameter**: r20180
- **Description**: Display parameter for output pulse Q of instance PST 0 of the pulse extension element.
- **CU values**: CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)
- **Can be changed**: -
- **Data type**: Unsigned32
- **P-Group**: -
- **Not for motor type**: -
- **Calculated**: -
- **Dynamic index**: -
- **Units group**: -
- **Scaling**: -
- **Access level**: 1
- **Func. diagram**: 7234
- **Expert list**: 1
- **Factory setting**: -
- **Min**: -
- **Max**: -

#### p20181
**PST 0 run-time group / PST 0 RTG**

- **Parameter**: p20181
- **Description**: Setting parameter for the run-time group in which the instance PST 0 of the pulse extension element is to be called.
- **CU values**: CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)
- **Can be changed**: T
- **Data type**: Integer16
- **P-Group**: -
- **Not for motor type**: -
- **Calculated**: -
- **Dynamic index**: -
- **Units group**: -
- **Scaling**: -
- **Access level**: 1
- **Func. diagram**: 7234
- **Expert list**: 1
- **Factory setting**: 9999
- **Min**: 0
- **Max**: 9999
### Parameter List of parameters

**Value:**

- **0:** Run-time group 0
- **1:** Run-time group 1
- **2:** Run-time group 2
- **3:** Run-time group 3
- **4:** Run-time group 4
- **5:** Run-time group 5
- **6:** Run-time group 6
- **7:** Run-time group 7
- **8:** Run-time group 8
- **9:** Run-time group 9
- **9999:** Do not calculate

**Description:**

Setting parameter for the run sequence of instance PST 0 within the run-time group set in p20181.

**Note:**

The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

### p20182 PST 0 run sequence / PST 0 RunSeq

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Calculated</th>
<th>Access level</th>
<th>Func. diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CU_S110-CAN,</strong> <strong>CU_S110-DP,</strong> <strong>CU_S110-PN,</strong> <strong>SERVO_S110-CAN</strong> (FBLOCKS), <strong>SERVO_S110-DP</strong> (FBLOCKS), <strong>SERVO_S110-PN</strong> (FBLOCKS)</td>
<td></td>
<td>-</td>
<td>1</td>
<td>7234</td>
</tr>
</tbody>
</table>

**Description:**

Setting parameter for the run sequence of instance PST 0 within the run-time group set in p20181.

**Note:**

The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

### p20183[0...1] BI: PST 1 inputs / PST 1 inputs

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Calculated</th>
<th>Access level</th>
<th>Func. diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CU_S110-CAN,</strong> <strong>CU_S110-DP,</strong> <strong>CU_S110-PN,</strong> <strong>SERVO_S110-CAN</strong> (FBLOCKS), <strong>SERVO_S110-DP</strong> (FBLOCKS), <strong>SERVO_S110-PN</strong> (FBLOCKS)</td>
<td></td>
<td>-</td>
<td>1</td>
<td>7234</td>
</tr>
</tbody>
</table>

**Description:**

Sets the signal source for input pulse I and the reset input R of instance PST 1 of the pulse extension element.

**Index:**

- **[0] = Input pulse I**
- **[1] = Reset input R**

### p20184 PST 1 pulse duration in ms / PST 1 pulse_dur ms

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Calculated</th>
<th>Access level</th>
<th>Func. diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CU_S110-CAN,</strong> <strong>CU_S110-DP,</strong> <strong>CU_S110-PN,</strong> <strong>SERVO_S110-CAN</strong> (FBLOCKS), <strong>SERVO_S110-DP</strong> (FBLOCKS), <strong>SERVO_S110-PN</strong> (FBLOCKS)</td>
<td></td>
<td>-</td>
<td>1</td>
<td>7234</td>
</tr>
</tbody>
</table>

**Description:**

Setting parameter for pulse duration T in milliseconds of instance PST 1 of the pulse extension element.
**Parameter**

**List of parameters**

### r20185

**BO: PST 1 output Q / PST 1 output Q**

**Description:** Display parameter for output pulse Q of instance PST 1 of the pulse extension element.

**Value:**

- **0:** Run-time group 0
- **1:** Run-time group 1
- **2:** Run-time group 2
- **3:** Run-time group 3
- **4:** Run-time group 4
- **5:** Run-time group 5
- **6:** Run-time group 6
- **7:** Run-time group 7
- **8:** Run-time group 8
- **9:** Run-time group 9
- **9999:** Do not calculate

**Can be changed:** -

**Data type:** Unsigned32

**P-Group:** -

**Not for motor type:** -

**Min:** -

**Max:** -

**Factory setting:** -

**Access level:** 1

**Func. diagram:** 7234

**Expert list:** 1

### p20186

**PST 1 run-time group / PST 1 RTG**

**Description:** Setting parameter for the run-time group in which the instance PST 1 of the pulse extension element is to be called.

**Value:**

- **0:** Run-time group 0
- **1:** Run-time group 1
- **2:** Run-time group 2
- **3:** Run-time group 3
- **4:** Run-time group 4
- **5:** Run-time group 5
- **6:** Run-time group 6
- **7:** Run-time group 7
- **8:** Run-time group 8
- **9:** Run-time group 9
- **9999:** Do not calculate

**Can be changed:** T

**Data type:** Integer16

**P-Group:** -

**Not for motor type:** -

**Min:** 0

**Max:** 9999

**Factory setting:** 9999

**Access level:** 1

**Func. diagram:** 7234

**Expert list:** 1

### p20187

**PST 1 run sequence / PST 1 RunSeq**

**Description:** Setting parameter for the run sequence of instance PST 1 within the run-time group set in p20186.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

**Can be changed:** T

**Data type:** Unsigned16

**P-Group:** -

**Not for motor type:** -

**Min:** 0

**Max:** 7999

**Factory setting:** 500

**Access level:** 1

**Func. diagram:** 7234

**Expert list:** 1
### p20188[0...1]

**Parameter**: BI: RSR 0 inputs / RSR 0 inputs

**Description**: Sets the signal source for set input S and reset input R of instance RSR 0 of the RS flipflop.

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>0</td>
</tr>
</tbody>
</table>

**Index**:

- [0] = Set S
- [1] = Reset R

**Data**:
- Can be changed: T
- Data type: Unsigned32 / Binary
- Dynamic index: -
- Units group: -
- Not for motor type: -
- Scaling: -

**Access level**: 1

**Func. diagram**: 7240

**P-Group**:

- -

**Units group**:

- -

**Unit selection**:

- -

**Expert list**: 1

**Not for motor type**: -

**Scaling**: -

**Min**: -

**Max**: -

**Expert list**: 1

**BO: RSR 0 output Q / RSR 0 output Q**

**Description**: Display parameter for output Q of instance RSR 0 of the RS flipflop

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**BO: RSR 0 inverted output QN / RSR 0 inv outp QN**

**Description**: Display parameter for inverted output QN of instance RSR 0 of the RS flipflop

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**BO: RSR 0 run-time group / RSR 0 RTG**

**Description**: Setting parameter for the run-time group in which instance RSR 0 of the RS flipflop is to be called.
List of parameters

**Value:**
- 0: Run-time group 0
- 1: Run-time group 1
- 2: Run-time group 2
- 3: Run-time group 3
- 4: Run-time group 4
- 5: Run-time group 5
- 6: Run-time group 6
- 7: Run-time group 7
- 8: Run-time group 8
- 9: Run-time group 9
- 9999: Do not calculate

**Description:**
Setting parameter for the run sequence of instance RSR 0 within the run-time group set in p20191.

**Note:**
The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

---

**p20192**

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
<th>Calculated</th>
<th>Access level</th>
<th>Func. diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Run-time group 0</td>
<td>-</td>
<td>1</td>
<td>7240</td>
</tr>
<tr>
<td>1</td>
<td>Run-time group 1</td>
<td>-</td>
<td>1</td>
<td>7240</td>
</tr>
<tr>
<td>2</td>
<td>Run-time group 2</td>
<td>-</td>
<td>1</td>
<td>7240</td>
</tr>
<tr>
<td>3</td>
<td>Run-time group 3</td>
<td>-</td>
<td>1</td>
<td>7240</td>
</tr>
<tr>
<td>4</td>
<td>Run-time group 4</td>
<td>-</td>
<td>1</td>
<td>7240</td>
</tr>
<tr>
<td>5</td>
<td>Run-time group 5</td>
<td>-</td>
<td>1</td>
<td>7240</td>
</tr>
<tr>
<td>6</td>
<td>Run-time group 6</td>
<td>-</td>
<td>1</td>
<td>7240</td>
</tr>
<tr>
<td>7</td>
<td>Run-time group 7</td>
<td>-</td>
<td>1</td>
<td>7240</td>
</tr>
<tr>
<td>8</td>
<td>Run-time group 8</td>
<td>-</td>
<td>1</td>
<td>7240</td>
</tr>
<tr>
<td>9</td>
<td>Run-time group 9</td>
<td>-</td>
<td>1</td>
<td>7240</td>
</tr>
<tr>
<td>9999</td>
<td>Do not calculate</td>
<td>-</td>
<td>1</td>
<td>7240</td>
</tr>
</tbody>
</table>

**Description:**
Can be changed: T

**Data type:** Unsigned16

**P-Group:** -

**Not for motor type:** -

**Min:**
- 0

**Max:**
- 7999

**Factory setting:**
- 520

**Index:**
[0] = Set S
[1] = Reset R

**Description:**
Setting parameter for the run sequence of instance RSR 0 within the run-time group set in p20191.

---

**p20193[0...1]**

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
<th>Calculated</th>
<th>Access level</th>
<th>Func. diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>BI: RSR 1 inputs</td>
<td>-</td>
<td>1</td>
<td>7240</td>
</tr>
<tr>
<td>1</td>
<td>BI: RSR 1 outputs</td>
<td>-</td>
<td>1</td>
<td>7240</td>
</tr>
</tbody>
</table>

**Description:**
Sets the signal source for set input S and reset input R of instance RSR 1 of the RS flipflop.

**Index:**
[0] = Set S
[1] = Reset R

**Description:**
Can be changed: T

**Data type:** Unsigned32 / Binary

**P-Group:** -

**Not for motor type:** -

**Min:**
- -

**Max:**
- 0

**Factory setting:**
- -

**Description:**
Displays parameter for output Q of instance RSR 1 of the RS flipflop.

---

**r20194**

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
<th>Calculated</th>
<th>Access level</th>
<th>Func. diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>BO: RSR 1 output Q</td>
<td>-</td>
<td>1</td>
<td>7240</td>
</tr>
<tr>
<td>1</td>
<td>BO: RSR 1 outputs</td>
<td>-</td>
<td>1</td>
<td>7240</td>
</tr>
</tbody>
</table>

**Description:**
Can be changed: -

**Data type:** Unsigned32

**P-Group:** -

**Not for motor type:** -

**Min:**
- -

**Max:**
- -

**Factory setting:**
- -

**Description:**
Displays parameter for output Q of instance RSR 1 of the RS flipflop.
### r20195 BO: RSR 1 inverted output QN / RSR 1 inv outp QN

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
<th>Data type:</th>
<th>Dynamic index:</th>
<th>Units group:</th>
<th>Scaling:</th>
<th>Expert list:</th>
</tr>
</thead>
<tbody>
<tr>
<td>CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)</td>
<td>Display parameter for inverted output QN of instance RSR 1 of the RS flipflop.</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>Unsigned32</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

### p20196 RSR 1 run-time group / RSR 1 RTG

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
<th>Data type:</th>
<th>Dynamic index:</th>
<th>Units group:</th>
<th>Scaling:</th>
<th>Expert list:</th>
</tr>
</thead>
<tbody>
<tr>
<td>CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)</td>
<td>Setting parameter for the run-time group in which instance RSR 1 of the RS flipflop is to be called.</td>
<td>T</td>
<td>-</td>
<td>1</td>
<td>Integer16</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>9999</td>
<td>9999</td>
</tr>
</tbody>
</table>

### p20197 RSR 1 run sequence / RSR 1 RunSeq

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
<th>Data type:</th>
<th>Dynamic index:</th>
<th>Units group:</th>
<th>Scaling:</th>
<th>Expert list:</th>
</tr>
</thead>
<tbody>
<tr>
<td>CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)</td>
<td>Setting parameter for the run sequence of instance RSR 1 within the run-time group set in p20196.</td>
<td>T</td>
<td>-</td>
<td>1</td>
<td>Unsigned16</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>7999</td>
<td>530</td>
</tr>
</tbody>
</table>

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.
## List of parameters

### p20198[0...3]
**BI: DFR 0 inputs / DFR 0 inputs**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sets the signal source for trigger input I, D input D, set input S, and reset input R of instance DFR 0 of the D flipflop.</td>
<td>T</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Index:</td>
<td>[0] = Trigger input I</td>
<td></td>
<td>Dynamic index:</td>
<td>Func. diagram:</td>
</tr>
<tr>
<td></td>
<td>[1] = D input D</td>
<td></td>
<td>Units group:</td>
<td>7240</td>
</tr>
<tr>
<td></td>
<td>[2] = Set S</td>
<td></td>
<td>Scaling:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[3] = Reset R</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

### r20199
**BO: DFR 0 output Q / DFR 0 output Q**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Can be changed:</th>
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<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Display parameter for output Q of instance DFR 0 of the D flipflop.</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Data type:</td>
<td>Unsigned32</td>
<td>Dynamic index:</td>
<td>Func. diagram:</td>
<td></td>
</tr>
<tr>
<td>P-Group:</td>
<td>-</td>
<td>Units group:</td>
<td>7240</td>
<td></td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
<td>Scaling:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>0</td>
</tr>
</tbody>
</table>

### r20200
**BO: DFR 0 inverted output QN / DFR 0 inv outp QN**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Display parameter for the inverted output QN of instance DFR 0 of the D flipflop.</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Data type:</td>
<td>Unsigned32</td>
<td>Dynamic index:</td>
<td>Func. diagram:</td>
<td></td>
</tr>
<tr>
<td>P-Group:</td>
<td>-</td>
<td>Units group:</td>
<td>7240</td>
<td></td>
</tr>
<tr>
<td>Not for motor type:</td>
<td>-</td>
<td>Scaling:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>0</td>
</tr>
</tbody>
</table>

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SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3
### p20201

**DFR 0 run-time group / DFR 0 RTG**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>p20201</td>
<td>Setting parameter for the run-time group in which instance DFR 0 of the D flipflop is to be called.</td>
<td><strong>Value:</strong>&lt;br&gt;0: Run-time group 0&lt;br&gt;1: Run-time group 1&lt;br&gt;2: Run-time group 2&lt;br&gt;3: Run-time group 3&lt;br&gt;4: Run-time group 4&lt;br&gt;5: Run-time group 5&lt;br&gt;6: Run-time group 6&lt;br&gt;7: Run-time group 7&lt;br&gt;8: Run-time group 8&lt;br&gt;9: Run-time group 9&lt;br&gt;9999: Do not calculate</td>
</tr>
</tbody>
</table>

#### Parameters
- **Parameter**: p20201
- **CU_S110-CAN**, **CU_S110-DP**, **CU_S110-PN**, **SERVO_S110-CAN (FBLOCKS)**, **SERVO_S110-DP (FBLOCKS)**, **SERVO_S110-PN (FBLOCKS)**

**Access level**: 1
**Func. diagram**: 7240
**Dynamic index**: -
**Units group**: -
**Unit selection**: -
**Expert list**: 1

**Min**: 0<br>**Max**: 9999<br>**Factory setting**: 9999

### p20202

**DFR 0 run sequence / DFR 0 RunSeq**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>p20202</td>
<td>Setting parameter for the run sequence of instance DFR 0 within the run-time group set in p20201.</td>
<td><strong>Value:</strong>&lt;br&gt;The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.</td>
</tr>
</tbody>
</table>

#### Parameters
- **Parameter**: p20202
- **CU_S110-CAN**, **CU_S110-DP**, **CU_S110-PN**, **SERVO_S110-CAN (FBLOCKS)**, **SERVO_S110-DP (FBLOCKS)**, **SERVO_S110-PN (FBLOCKS)**

**Access level**: 1
**Func. diagram**: 7240
**Dynamic index**: -
**Units group**: -
**Unit selection**: -
**Expert list**: 1

**Min**: 0<br>**Max**: 32000<br>**Factory setting**: 550

### p20203[0...3]

**BI: DFR 1 inputs / DFR 1 inputs**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
</table>

#### Parameters
- **Parameter**: p20203
- **CU_S110-CAN**, **CU_S110-DP**, **CU_S110-PN**, **SERVO_S110-CAN (FBLOCKS)**, **SERVO_S110-DP (FBLOCKS)**, **SERVO_S110-PN (FBLOCKS)**

**Access level**: 1
**Func. diagram**: 7240
**Dynamic index**: -
**Units group**: -
**Unit selection**: -
**Expert list**: 1

**Min**: -<br>**Max**: -

**Factory setting**: 0
### List of parameters

#### Parameter r20204
**BO: DFR 1 output Q / DFR 1 output Q**

<table>
<thead>
<tr>
<th>Description</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display parameter for output Q of instance DFR 1 of the D flipflop.</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>BO: DFR 1 output Q / DFR 1 output Q</td>
<td>-</td>
<td>-</td>
<td>1</td>
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</tbody>
</table>

<table>
<thead>
<tr>
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<th>Dynamic index:</th>
<th>Units group:</th>
<th>Unit selection:</th>
</tr>
</thead>
<tbody>
<tr>
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<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>P-Group:</th>
<th>Not for motor type:</th>
<th>Scaling:</th>
<th>Expert list:</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CU_S110-CAN,</th>
<th>CU_S110-DP,</th>
<th>CU_S110-PN,</th>
<th>SERVO_S110-CAN (FBLOCKS),</th>
<th>SERVO_S110-DP (FBLOCKS),</th>
<th>SERVO_S110-PN (FBLOCKS)</th>
</tr>
</thead>
</table>

#### Parameter r20205
**BO: DFR 1 inverted output QN / DFR 1 inv outp QN**

<table>
<thead>
<tr>
<th>Description</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display parameter for the inverted output QN of instance DFR 1 of the D flipflop.</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>BO: DFR 1 inverted output QN / DFR 1 inv outp QN</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Data type:</th>
<th>Dynamic index:</th>
<th>Units group:</th>
<th>Unit selection:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unsigned32</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>P-Group:</th>
<th>Not for motor type:</th>
<th>Scaling:</th>
<th>Expert list:</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CU_S110-CAN,</th>
<th>CU_S110-DP,</th>
<th>CU_S110-PN,</th>
<th>SERVO_S110-CAN (FBLOCKS),</th>
<th>SERVO_S110-DP (FBLOCKS),</th>
<th>SERVO_S110-PN (FBLOCKS)</th>
</tr>
</thead>
</table>

#### Parameter p20206
**DFR 1 run-time group / DFR 1 RTG**

<table>
<thead>
<tr>
<th>Description</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Setting parameter for the run-time group in which instance DFR 1 of the D flipflop is to be called.</td>
<td>0</td>
<td>9999</td>
<td>9999</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>DFR 1 run-time group / DFR 1 RTG</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Data type:</th>
<th>Dynamic index:</th>
<th>Units group:</th>
<th>Unit selection:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integer16</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>P-Group:</th>
<th>Not for motor type:</th>
<th>Scaling:</th>
<th>Expert list:</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CU_S110-CAN,</th>
<th>CU_S110-DP,</th>
<th>CU_S110-PN,</th>
<th>SERVO_S110-CAN (FBLOCKS),</th>
<th>SERVO_S110-DP (FBLOCKS),</th>
<th>SERVO_S110-PN (FBLOCKS)</th>
</tr>
</thead>
</table>

#### Additional Information
- **Value:**
  - 0: Run-time group 0
  - 1: Run-time group 1
  - 2: Run-time group 2
  - 3: Run-time group 3
  - 4: Run-time group 4
  - 5: Run-time group 5
  - 6: Run-time group 6
  - 7: Run-time group 7
  - 8: Run-time group 8
  - 9: Run-time group 9
  - 9999: Do not calculate
Parameter

List of parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p20207</td>
<td>DFR 1 run sequence / DFR 1 RunSeq</td>
<td>Setting parameter for the run-time group of instance DFR 1 within the run-time group set in p20206. The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.</td>
</tr>
<tr>
<td>p20208[0...1]</td>
<td>BI: BSW 0 inputs / BSW 0 inputs</td>
<td>Sets the signal source of input quantities I0 and I1 of instance BSW 0 of the binary changeover switch.</td>
</tr>
<tr>
<td>p20209</td>
<td>BI: BSW 0 switch setting I / BSW 0 sw_setting</td>
<td>Sets the signal source of the switch setting I of instance BSW 0 of the binary changeover switch.</td>
</tr>
</tbody>
</table>
### Parameter List

**Parameter:**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>BO: BSW 0 output Q / BSW 0 output Q</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>r20210</strong></td>
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</tr>
<tr>
<td>CU, S110-CAN,</td>
<td>Data type: Unsigned32</td>
</tr>
<tr>
<td>CU, S110-DP,</td>
<td>P-Group: -</td>
</tr>
<tr>
<td>CU, S110-PN,</td>
<td>Not for motor type: -</td>
</tr>
<tr>
<td>SERVO, S110-CAN (FBLOCKS),</td>
<td>-</td>
</tr>
<tr>
<td>SERVO, S110-DP (FBLOCKS),</td>
<td>-</td>
</tr>
<tr>
<td>SERVO, S110-PN (FBLOCKS)</td>
<td>-</td>
</tr>
</tbody>
</table>

**Description:** Display parameter for output quantity Q of instance BSW 0 of the binary changeover switch.

**Value:**

- 0: Run-time group 0
- 1: Run-time group 1
- 2: Run-time group 2
- 3: Run-time group 3
- 4: Run-time group 4
- 5: Run-time group 5
- 6: Run-time group 6
- 7: Run-time group 7
- 8: Run-time group 8
- 9: Run-time group 9
- 9999: Do not calculate

<table>
<thead>
<tr>
<th>Parameter</th>
<th>BSW 0 run-time group / BSW 0 RTG</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>p20211</strong></td>
<td>Can be changed: T</td>
</tr>
<tr>
<td>CU, S110-CAN,</td>
<td>Data type: Integer16</td>
</tr>
<tr>
<td>CU, S110-DP,</td>
<td>P-Group: -</td>
</tr>
<tr>
<td>CU, S110-PN,</td>
<td>Not for motor type: -</td>
</tr>
<tr>
<td>SERVO, S110-CAN (FBLOCKS),</td>
<td>-</td>
</tr>
<tr>
<td>SERVO, S110-DP (FBLOCKS),</td>
<td>-</td>
</tr>
<tr>
<td>SERVO, S110-PN (FBLOCKS)</td>
<td>-</td>
</tr>
</tbody>
</table>

**Description:** Setting parameter for the run-time group in which the instance BSW 0 of the binary changeover switch is to be called.

**Value:**

- 0: Run-time group 0
- 1: Run-time group 1
- 2: Run-time group 2
- 3: Run-time group 3
- 4: Run-time group 4
- 5: Run-time group 5
- 6: Run-time group 6
- 7: Run-time group 7
- 8: Run-time group 8
- 9: Run-time group 9
- 9999: Do not calculate

<table>
<thead>
<tr>
<th>Parameter</th>
<th>BSW 0 run sequence / BSW 0 RunSeq</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>p20212</strong></td>
<td>Can be changed: T</td>
</tr>
<tr>
<td>CU, S110-CAN,</td>
<td>Data type: Unsigned16</td>
</tr>
<tr>
<td>CU, S110-DP,</td>
<td>P-Group: -</td>
</tr>
<tr>
<td>CU, S110-PN,</td>
<td>Not for motor type: -</td>
</tr>
<tr>
<td>SERVO, S110-CAN (FBLOCKS),</td>
<td>-</td>
</tr>
<tr>
<td>SERVO, S110-DP (FBLOCKS),</td>
<td>-</td>
</tr>
<tr>
<td>SERVO, S110-PN (FBLOCKS)</td>
<td>-</td>
</tr>
</tbody>
</table>

**Description:** Setting parameter for the run sequence of instance BSW 0 within the run-time group set in p20211.

**Note:**
The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.
### List of parameters

#### p20213[0...1]

**BI: BSW 1 inputs / BSW 1 inputs**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Index</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
<th>Data type:</th>
<th>Dynamic index:</th>
<th>Units group:</th>
<th>Unit selection:</th>
<th>Expert list:</th>
<th>P-Group:</th>
<th>Units group:</th>
<th>Unit selection:</th>
<th>Expert list:</th>
</tr>
</thead>
<tbody>
<tr>
<td>p20213[0]</td>
<td>Sets the signal source of input quantities I0 and I1 of instance BSW 1 of the binary changeover switch.</td>
<td>[0] = Input I0</td>
<td>T</td>
<td>-</td>
<td>1</td>
<td>Unsigned32 / Binary</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>p20213[1]</td>
<td></td>
<td>[1] = Input I1</td>
<td>T</td>
<td>-</td>
<td>1</td>
<td>Unsigned32 / Binary</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>

#### p20214

**BI: BSW 1 switch setting I / BSW 1 sw_setting**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
<th>Data type:</th>
<th>Dynamic index:</th>
<th>Units group:</th>
<th>Unit selection:</th>
<th>Expert list:</th>
<th>P-Group:</th>
<th>Units group:</th>
<th>Unit selection:</th>
<th>Expert list:</th>
</tr>
</thead>
<tbody>
<tr>
<td>p20214</td>
<td>Sets the signal source of the switch setting I of instance BSW 1 of the binary changeover switch.</td>
<td>T</td>
<td>-</td>
<td>1</td>
<td>Unsigned32 / Binary</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>

#### r20215

**BO: BSW 1 output Q / BSW 1 output Q**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
<th>Data type:</th>
<th>Dynamic index:</th>
<th>Units group:</th>
<th>Unit selection:</th>
<th>Expert list:</th>
<th>P-Group:</th>
<th>Units group:</th>
<th>Unit selection:</th>
<th>Expert list:</th>
</tr>
</thead>
<tbody>
<tr>
<td>r20215</td>
<td>Display parameter for output quantity Q of instance BSW 1 of the binary changeover switch.</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>Unsigned32</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>

#### p20216

**BSW 1 run-time group / BSW 1 RTG**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Can be changed:</th>
<th>Calculated:</th>
<th>Access level:</th>
<th>Data type:</th>
<th>Dynamic index:</th>
<th>Units group:</th>
<th>Unit selection:</th>
<th>Expert list:</th>
<th>P-Group:</th>
<th>Units group:</th>
<th>Unit selection:</th>
<th>Expert list:</th>
</tr>
</thead>
<tbody>
<tr>
<td>p20216</td>
<td>Setting parameter for the run-time group in which the instance BSW 1 of the binary changeover switch is to be called.</td>
<td>T</td>
<td>-</td>
<td>1</td>
<td>Integer16</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>9999</td>
<td>9999</td>
</tr>
</tbody>
</table>
List of parameters

**Parameter**

**Value:**
- 0: Run-time group 0
- 1: Run-time group 1
- 2: Run-time group 2
- 3: Run-time group 3
- 4: Run-time group 4
- 5: Run-time group 5
- 6: Run-time group 6
- 7: Run-time group 7
- 8: Run-time group 8
- 9: Run-time group 9
- 9999: Do not calculate

**Description:**
Setting parameter for the run sequence of instance BSW 1 within the run-time group set in p20216.

**Note:**
The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

---

**p20217 BSW 1 run sequence / BSW 1 RunSeq**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p20217</td>
<td>0-9999</td>
<td>BSW 1 run sequence / BSW 1 RunSeq</td>
<td>Setting parameter for the run sequence of instance BSW 1 within the run-time group set in p20216. The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.</td>
</tr>
</tbody>
</table>

**Description:**
Setting parameter for the run sequence of instance BSW 1 within the run-time group set in p20216.

**Note:**
The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

---

**p20218[0...1] CI: NSW 0 inputs / NSW 0 inputs**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p20218</td>
<td>0-1</td>
<td>CI: NSW 0 inputs / NSW 0 inputs</td>
<td>The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.</td>
</tr>
</tbody>
</table>

**Description:**
Sets the signal source of input quantities X0 and X1 of instance NSW 0 of the numeric changeover switch.

**Index:**
- [0] = Input X0
- [1] = Input X1

---

**p20219 BI: NSW 0 switch setting I / NSW 0 sw_setting**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p20219</td>
<td>0-1</td>
<td>BI: NSW 0 switch setting I / NSW 0 sw_setting</td>
<td>The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.</td>
</tr>
</tbody>
</table>

**Description:**
Sets the signal source of the switch setting I of instance NSW 0 of the numeric changeover switch.
Parameter

List of parameters

**r20220**

**CO: NSW 0 output Y / NSW 0 output Y**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed</td>
<td>Display parameter for output quantity Y of instance NSW 0 of the numeric changeover switch.</td>
<td>-</td>
</tr>
<tr>
<td>Data type</td>
<td>Setting parameter for the run-time group in which the instance NSW 0 of the numeric changeover switch is to be called.</td>
<td>FloatingPoint32</td>
</tr>
<tr>
<td>P-Group</td>
<td>Setting parameter for the run sequence of instance NSW 0 within the run-time group set in p20221.</td>
<td>-</td>
</tr>
<tr>
<td>Not for motor type</td>
<td>Setting parameter for the run sequence of instance NSW 0 within the run-time group set in p20221.</td>
<td>-</td>
</tr>
<tr>
<td>アクセスレベル</td>
<td>Setting parameter for the run sequence of instance NSW 0 within the run-time group set in p20221.</td>
<td>1</td>
</tr>
<tr>
<td>Data type</td>
<td>Setting parameter for the run sequence of instance NSW 0 within the run-time group set in p20221.</td>
<td>Integer16</td>
</tr>
<tr>
<td>P-Group</td>
<td>Setting parameter for the run sequence of instance NSW 0 within the run-time group set in p20221.</td>
<td>-</td>
</tr>
<tr>
<td>Not for motor type</td>
<td>Setting parameter for the run sequence of instance NSW 0 within the run-time group set in p20221.</td>
<td>-</td>
</tr>
</tbody>
</table>

**p20221**

**NSW 0 run-time group / NSW 0 RTG**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed</td>
<td>Setting parameter for the run-time group in which the instance NSW 0 of the numeric changeover switch is to be called.</td>
<td>T</td>
</tr>
<tr>
<td>Data type</td>
<td>Setting parameter for the run-time group in which the instance NSW 0 of the numeric changeover switch is to be called.</td>
<td>Integer16</td>
</tr>
<tr>
<td>P-Group</td>
<td>Setting parameter for the run-time group in which the instance NSW 0 of the numeric changeover switch is to be called.</td>
<td>-</td>
</tr>
<tr>
<td>Not for motor type</td>
<td>Setting parameter for the run-time group in which the instance NSW 0 of the numeric changeover switch is to be called.</td>
<td>-</td>
</tr>
</tbody>
</table>

**p20222**

**NSW 0 run sequence / NSW 0 RunSeq**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be changed</td>
<td>Setting parameter for the run sequence of instance NSW 0 within the run-time group set in p20221.</td>
<td>T</td>
</tr>
<tr>
<td>Data type</td>
<td>Setting parameter for the run sequence of instance NSW 0 within the run-time group set in p20221.</td>
<td>Unsigned16</td>
</tr>
<tr>
<td>P-Group</td>
<td>Setting parameter for the run sequence of instance NSW 0 within the run-time group set in p20221.</td>
<td>-</td>
</tr>
<tr>
<td>Not for motor type</td>
<td>Setting parameter for the run sequence of instance NSW 0 within the run-time group set in p20221.</td>
<td>-</td>
</tr>
</tbody>
</table>

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SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Data type</th>
<th>Access level</th>
<th>Func. diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>p20223[0...1]</td>
<td>CAN: NSW 1 inputs / NSW 1 inputs</td>
<td>Can be changed: T</td>
<td>Calculated: -</td>
<td>Access level: 1</td>
</tr>
<tr>
<td></td>
<td>Data type: Unsigned32 / FloatingPoint32</td>
<td>Dynamic index: -</td>
<td>Factory setting</td>
<td>Func. diagram: 7250</td>
</tr>
<tr>
<td></td>
<td>P-Group: -</td>
<td>Units group: -</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not for motor type: -</td>
<td>Scaling: PERCENT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Index:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[0] = Input X0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[1] = Input X1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Description:</td>
<td>Sets the signal source of input quantities X0 and X1 of instance NSW 1 of the numeric changeover switch.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>p20224</td>
<td>BI: NSW 1 switch setting I / NSW 1 sw_setting</td>
<td>Can be changed: T</td>
<td>Calculated: -</td>
<td>Access level: 1</td>
</tr>
<tr>
<td></td>
<td>Data type: Unsigned32 / Binary</td>
<td>Dynamic index: -</td>
<td>Factory setting</td>
<td>Func. diagram: 7250</td>
</tr>
<tr>
<td></td>
<td>P-Group: -</td>
<td>Units group: -</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Index:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Description:</td>
<td>Sets the signal source of the switch setting I of instance NSW 1 of the numeric changeover switch.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>r20225</td>
<td>CO: NSW 1 output Y / NSW 1 output Y</td>
<td>Can be changed: -</td>
<td>Calculated: -</td>
<td>Access level: 1</td>
</tr>
<tr>
<td></td>
<td>Data type: FloatingPoint32</td>
<td>Dynamic index: -</td>
<td>Factory setting</td>
<td>Func. diagram: 7250</td>
</tr>
<tr>
<td></td>
<td>P-Group: -</td>
<td>Units group: -</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not for motor type: -</td>
<td>Scaling: PERCENT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Index:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Description:</td>
<td>Display parameter for output quantity Y of instance NSW 1 of the numeric changeover switch.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>p20226</td>
<td>NSW 1 run-time group / NSW 1 RTG</td>
<td>Can be changed: T</td>
<td>Calculated: -</td>
<td>Access level: 1</td>
</tr>
<tr>
<td></td>
<td>Data type: Integer16</td>
<td>Dynamic index: -</td>
<td>Factory setting</td>
<td>Func. diagram: 7250</td>
</tr>
<tr>
<td></td>
<td>P-Group: -</td>
<td>Units group: -</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td>9999</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>9999</td>
<td></td>
<td>9999</td>
<td></td>
</tr>
</tbody>
</table>
### List of parameters

**Parameter**

**Value:**

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Run-time group 0</td>
</tr>
<tr>
<td>1</td>
<td>Run-time group 1</td>
</tr>
<tr>
<td>2</td>
<td>Run-time group 2</td>
</tr>
<tr>
<td>3</td>
<td>Run-time group 3</td>
</tr>
<tr>
<td>4</td>
<td>Run-time group 4</td>
</tr>
<tr>
<td>5</td>
<td>Run-time group 5</td>
</tr>
<tr>
<td>6</td>
<td>Run-time group 6</td>
</tr>
<tr>
<td>7</td>
<td>Run-time group 7</td>
</tr>
<tr>
<td>8</td>
<td>Run-time group 8</td>
</tr>
<tr>
<td>9</td>
<td>Run-time group 9</td>
</tr>
<tr>
<td>9999</td>
<td>Do not calculate</td>
</tr>
</tbody>
</table>

**p20227**

**NSW 1 run sequence / NSW 1 RunSeq**

<table>
<thead>
<tr>
<th>Can be changed</th>
<th>Calculated</th>
<th>Access level</th>
<th>Func. diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>T</td>
<td>-</td>
<td>1</td>
<td>7250</td>
</tr>
</tbody>
</table>

**Data type:** Unsigned16  
**P-Group:** -  
**Not for motor type:** -  
**Min:** 0  
**Max:** 32000  
**Factory setting:** 620

**Description:** Setting parameter for the run sequence of instance NSW 1 within the run-time group set in p20226.  
**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

**p20228**

**CI: LIM 0 input X / LIM 0 input X**

<table>
<thead>
<tr>
<th>Can be changed</th>
<th>Calculated</th>
<th>Access level</th>
<th>Func. diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>T</td>
<td>-</td>
<td>1</td>
<td>7260</td>
</tr>
</tbody>
</table>

**Data type:** Unsigned32 / FloatingPoint32  
**P-Group:** -  
**Not for motor type:** -  
**Min:** -  
**Max:** -  
**Factory setting:** 0

**Description:** Sets the signal source of input quantity X of instance LIM 0 of the limiter.

**p20229**

**LIM 0 upper limit value LU / LIM 0 upper lim LU**

<table>
<thead>
<tr>
<th>Can be changed</th>
<th>Calculated</th>
<th>Access level</th>
<th>Func. diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>T</td>
<td>-</td>
<td>1</td>
<td>7260</td>
</tr>
</tbody>
</table>

**Data type:** FloatingPoint32  
**P-Group:** -  
**Not for motor type:** -  
**Min:** -340.28235E36  
**Max:** 340.28235E36  
**Factory setting:** 0.0000

**Description:** Setting parameter for the upper limit value LU of instance LIM 0 of the limiter.
### List of parameters

**p20230**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIM 0 lower limit value LL</td>
<td>Setting parameter for the lower limit value LL of instance LIM 0 of the limiter.</td>
<td>-340.28235E36</td>
<td>340.28235E36</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

**r20231**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Can be changed</th>
<th>Calculated</th>
<th>Access level</th>
<th>Func. diagram</th>
<th>P-Group</th>
<th>Units group</th>
<th>Unit selection</th>
<th>Expert list</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO: LIM 0 output Y</td>
<td>Display parameter for the limited output quantity Y of instance LIM 0 of the limiter.</td>
<td>No</td>
<td>Yes</td>
<td>1</td>
<td>7260</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**r20232**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Can be changed</th>
<th>Calculated</th>
<th>Access level</th>
<th>Func. diagram</th>
<th>P-Group</th>
<th>Units group</th>
<th>Unit selection</th>
<th>Expert list</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>BO: LIM 0 input quantity at the upper limit QU</td>
<td>Display parameter of instance LIM 0 of limiter QU (upper limit reached), i.e. QU = 1 for X &gt;= LU.</td>
<td>No</td>
<td>Yes</td>
<td>1</td>
<td>7260</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**r20233**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Can be changed</th>
<th>Calculated</th>
<th>Access level</th>
<th>Func. diagram</th>
<th>P-Group</th>
<th>Units group</th>
<th>Unit selection</th>
<th>Expert list</th>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>BO: LIM 0 input quantity at the lower limit QL</td>
<td>Display parameter of instance LIM 0 of limiter QL (lower limit reached), i.e. QL = 1 for X &lt;= LL.</td>
<td>No</td>
<td>Yes</td>
<td>1</td>
<td>7260</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
**Parameter**

**List of parameters**

---

**p20234**

**LIM 0 run-time group / LIM 0 RTG**

Can be changed: T  
Calculated: -  
Access level: 1

Data type: Integer16  
Dynamic index: -  
Func. diagram: 7260

P-Group: -  
Units group: -  
Unit selection: -

Not for motor type: -  
Scaling: -  
Expert list: 1

CU_S110-CAN,  
CU_S110-DP,  
CU_S110-PN,  
SERVO_S110-CAN (FBLOCKS),  
SERVO_S110-DP (FBLOCKS),  
SERVO_S110-PN (FBLOCKS)

Min: 0  
Max: 9999  
Factory setting: 9999

**Description:** Setting parameter for the run-time group in which instance LIM 0 of the limiter is to be called.

**Value:**

0: Run-time group 0  
1: Run-time group 1  
2: Run-time group 2  
3: Run-time group 3  
4: Run-time group 4  
5: Run-time group 5  
6: Run-time group 6  
7: Run-time group 7  
8: Run-time group 8  
9: Run-time group 9  
9999: Do not calculate

---

**p20235**

**LIM 0 run sequence / LIM 0 RunSeq**

Can be changed: T  
Calculated: -  
Access level: 1

Data type: Unsigned16  
Dynamic index: -  
Func. diagram: 7260

P-Group: -  
Units group: -  
Unit selection: -

Not for motor type: -  
Scaling: -  
Expert list: 1

CU_S110-CAN,  
CU_S110-DP,  
CU_S110-PN,  
SERVO_S110-CAN (FBLOCKS),  
SERVO_S110-DP (FBLOCKS),  
SERVO_S110-PN (FBLOCKS)

Min: 0  
Max: 32000  
Factory setting: 640

**Description:** Setting parameter for the run sequence of instance LIM 0 within the run-time group set in p20234.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

---

**p20236**

**CI: LIM 1 input X / LIM 1 input X**

Can be changed: T  
Calculated: -  
Access level: 1

Data type: Unsigned32 / FloatingPoint32  
Dynamic index: -  
Func. diagram: 7260

P-Group: -  
Units group: -  
Unit selection: -

Not for motor type: -  
Scaling: PERCENT  
Expert list: 1

CU_S110-CAN,  
CU_S110-DP,  
CU_S110-PN,  
SERVO_S110-CAN (FBLOCKS),  
SERVO_S110-DP (FBLOCKS),  
SERVO_S110-PN (FBLOCKS)

Min: -  
Max: -  
Factory setting: 0

**Description:** Sets the signal source of input quantity X of instance LIM 1 of the limiter.
### List of parameters

#### p20237
**LIM 1 upper limit value LU / LIM 1 upper lim LU**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min</td>
<td>-340.28235E36</td>
<td>Setting parameter for the upper limit value LU of instance LIM 1 of the limiter.</td>
</tr>
<tr>
<td>Max</td>
<td>340.28235E36</td>
<td></td>
</tr>
<tr>
<td>Factory setting</td>
<td>0.0000</td>
<td></td>
</tr>
</tbody>
</table>

#### p20238
**LIM 1 lower limit value LL / LIM 1 lower lim LL**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min</td>
<td>-340.28235E36</td>
<td>Setting parameter for the lower limit value LL of instance LIM 1 of the limiter.</td>
</tr>
<tr>
<td>Max</td>
<td>340.28235E36</td>
<td></td>
</tr>
<tr>
<td>Factory setting</td>
<td>0.0000</td>
<td></td>
</tr>
</tbody>
</table>

#### r20239
**CO: LIM 1 output Y / LIM 1 output Y**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min</td>
<td>-</td>
<td>Display parameter for the limited output quantity Y of instance LIM 1 of the limiter.</td>
</tr>
<tr>
<td>Max</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Factory setting</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

#### r20240
**BO: LIM 1 input quantity at the upper limit QU / LIM 1 QU**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min</td>
<td>-</td>
<td>Display parameter of instance LIM 1 of limiter QU (upper limit reached), i.e. QU = 1 for X &gt;= LU.</td>
</tr>
<tr>
<td>Max</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Factory setting</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>
### List of parameters

#### r20241
**BO: LIM 1 input quantity at the lower limit QL / LIM 1 QL**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>p20241 LIM 1 input quantity at the lower limit QL / LIM 1 QL</td>
<td>Can be changed: -</td>
<td>Calculated: -</td>
</tr>
<tr>
<td>Data type: Unsigned32</td>
<td>Dynamic index: -</td>
<td>Units group: -</td>
</tr>
<tr>
<td>P-Group: -</td>
<td>Unit selection: -</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td></td>
</tr>
</tbody>
</table>

- **Min**: -
- **Max**: -
- **Factory setting**: -

**Description:** Display parameter of instance LIM 1 of limiter QL (lower limit reached), i.e. QL = 1 for X <= LL.

#### p20242
**LIM 1 run-time group / LIM 1 RTG**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>p20242 LIM 1 run-time group / LIM 1 RTG</td>
<td>Can be changed: T</td>
<td>Calculated: -</td>
</tr>
<tr>
<td>Data type: Integer16</td>
<td>Dynamic index: -</td>
<td>Units group: -</td>
</tr>
<tr>
<td>P-Group: -</td>
<td>Unit selection: -</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td></td>
</tr>
</tbody>
</table>

- **Min**: 0
- **Max**: 9999
- **Factory setting**: 9999

**Description:** Setting parameter for the run-time group in which instance LIM 1 of the limiter is to be called.

**Value:**
- 0: Run-time group 0
- 1: Run-time group 1
- 2: Run-time group 2
- 3: Run-time group 3
- 4: Run-time group 4
- 5: Run-time group 5
- 6: Run-time group 6
- 7: Run-time group 7
- 8: Run-time group 8
- 9: Run-time group 9
- 999: Do not calculate

#### p20243
**LIM 1 run sequence / LIM 1 RunSeq**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>p20243 LIM 1 run sequence / LIM 1 RunSeq</td>
<td>Can be changed: T</td>
<td>Calculated: -</td>
</tr>
<tr>
<td>Data type: Unsigned16</td>
<td>Dynamic index: -</td>
<td>Units group: -</td>
</tr>
<tr>
<td>P-Group: -</td>
<td>Unit selection: -</td>
<td>Expert list: 1</td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td>Scaling: -</td>
<td></td>
</tr>
</tbody>
</table>

- **Min**: 0
- **Max**: 32000
- **Factory setting**: 650

**Description:** Setting parameter for the run sequence of instance LIM 1 within the run-time group set in p20242.

**Note:**
The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.
## List of parameters

### p20244[0...1]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CI: PT1 0 inputs / PT1 0 inputs</td>
<td></td>
<td>Sets the signal source of input quantity X and of setting value SV of instance PT1 0 of the smoothing element.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[0] = Input X</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[1] = Setting value SV</td>
</tr>
<tr>
<td>Can be changed: T</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data type: Unsigned32 / FloatingPoint32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P-Group: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factory setting</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

### p20245

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BI: PT1 0 accept setting value S / PT1 0 acc set val</td>
<td></td>
<td>Sets the signal source for the &quot;accept setting value&quot; signal of instant PT1 0 of the smoothing element.</td>
</tr>
<tr>
<td>Can be changed: T</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data type: Unsigned32 / Binary</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P-Group: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factory setting</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

### p20246

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PT1 0 smoothing time constant in ms / PT1 0 T_smooth ms</td>
<td></td>
<td>Sets the smoothing time constant T in milliseconds of instance PT1 0 of the smoothing element.</td>
</tr>
<tr>
<td>Can be changed: T</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P-Group: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>Max</td>
<td>340.28235E36</td>
<td></td>
</tr>
<tr>
<td>Factory setting</td>
<td>0.00</td>
<td></td>
</tr>
</tbody>
</table>

### r20247

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO: PT1 0 output Y / PT1 0 output Y</td>
<td></td>
<td>Display parameter for the smoothed output quantity Y of instance PT1 0 of the smoothing element.</td>
</tr>
<tr>
<td>Can be changed: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data type: FloatingPoint32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P-Group: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for motor type: -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factory setting</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### p20248
**PT1 0 run-time group / PT1 0 RTG**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Setting</th>
<th>Range</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>9999</td>
<td>9999</td>
<td></td>
</tr>
</tbody>
</table>

- **CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)**  
- **Can be changed:** T  
- **Data type:** Integer16  
- **P-Group:** -  
- **Not for motor type:** -  
- **Calculated:** -  
- **Dynamic index:** -  
- **Units group:** -  
- **Scaling:** -  
- **Access level:** 1  
- **Func. diagram:** 7262  
- **Unit selection:** -  
- **Expert list:** 1  

**Description:** Setting parameter for the run-time group in which instance PT1 0 of the smoothing element is to be called.

**Value:**
- 0: Run-time group 0  
- 1: Run-time group 1  
- 2: Run-time group 2  
- 3: Run-time group 3  
- 4: Run-time group 4  
- 5: Run-time group 5  
- 6: Run-time group 6  
- 7: Run-time group 7  
- 8: Run-time group 8  
- 9: Run-time group 9  
- 9999: Do not calculate

### p20249
**PT1 0 run sequence / PT1 0 RunSeq**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Setting</th>
<th>Range</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>32000</td>
<td>670</td>
<td></td>
</tr>
</tbody>
</table>

- **CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)**  
- **Can be changed:** T  
- **Data type:** Unsigned16  
- **P-Group:** -  
- **Not for motor type:** -  
- **Calculated:** -  
- **Dynamic index:** -  
- **Units group:** -  
- **Scaling:** -  
- **Access level:** 1  
- **Func. diagram:** 7262  
- **Unit selection:** -  
- **Expert list:** 1  

**Description:** Setting parameter for the run sequence of instance PT1 0 within the run-time group set in p20248.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

### p20250[0...1]
**CI: PT1 1 inputs / PT1 1 inputs**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Setting</th>
<th>Range</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min</td>
<td>Max</td>
<td>Factory setting</td>
<td></td>
</tr>
<tr>
<td>-</td>
<td>-</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

- **CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)**  
- **Can be changed:** T  
- **Data type:** Unsigned32 / FloatingPoint32  
- **P-Group:** -  
- **Not for motor type:** -  
- **Calculated:** -  
- **Dynamic index:** -  
- **Units group:** -  
- **Scaling:** PERCENT  
- **Access level:** 1  
- **Func. diagram:** 7262  
- **Unit selection:** -  
- **Expert list:** 1  

**Description:** Sets the signal source of input quantity X and of setting value SV of instance PT1 1 of the smoothing element.

- [0] = Input X  
- [1] = Setting value SV
### List of parameters

#### p20251
**BI: PT1 1 accept setting value S / PT1 1 acc set val**

- **Can be changed:** T
- **Data type:** Unsigned32 / Binary
- **P-Group:** -
- **Not for motor type:** -

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>0</td>
</tr>
</tbody>
</table>

**Description:** Sets the signal source for the "accept setting value" signal of instant PT1 1 of the smoothing element.

#### p20252
**PT1 1 smoothing time constant in ms / PT1 1 T_smooth ms**

- **Can be changed:** T
- **Data type:** FloatingPoint32
- **P-Group:** -
- **Not for motor type:** -

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.00</td>
<td>340.28235E36</td>
<td>0.00</td>
</tr>
</tbody>
</table>

**Description:** Sets the smoothing time constant T in milliseconds of instance PT1 1 of the smoothing element.

#### r20253
**CO: PT1 1 output Y / PT1 1 output Y**

- **Can be changed:** -
- **Data type:** FloatingPoint32
- **P-Group:** -
- **Not for motor type:** -

**Description:** Display parameter for the smoothed output quantity Y of instance PT1 1 of the smoothing element.

#### p20254
**PT1 1 run-time group / PT1 1 RTG**

- **Can be changed:** T
- **Data type:** Integer16
- **P-Group:** -
- **Not for motor type:** -

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>9999</td>
<td>9999</td>
</tr>
</tbody>
</table>

**Description:** Setting parameter for the run-time group in which instance PT1 1 of the smoothing element is to be called.

**Value:**
- 0: Run-time group 0
- 1: Run-time group 1
- 2: Run-time group 2
Parameter

List of parameters

3: Run-time group 3
4: Run-time group 4
5: Run-time group 5
6: Run-time group 6
7: Run-time group 7
8: Run-time group 8
9: Run-time group 9
9999: Do not calculate

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>p20255 PT1 1 run sequence / PT1 1 RunSeq</td>
<td>Setting parameter for the run sequence of instance PT1 1 within the run-time group set in p20254.</td>
</tr>
<tr>
<td>p20256[0...1] CI: INT 0 inputs / INT 0 inputs</td>
<td>Sets the signal source of input quantity X and of setting value SV of instance INT 0 of the integrator.</td>
</tr>
<tr>
<td>p20257 INT 0 upper limit value LU / INT 0 upper lim LU</td>
<td>Sets the upper limit value LU of instance INT 0 of the integrator.</td>
</tr>
</tbody>
</table>
### List of Parameters

#### p20258

**INT 0 lower limit value LL / INT 0 lower limit LL**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sets the lower limit value LL of instance INT 0 of the integrator.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min</td>
<td>-340.28235E36</td>
</tr>
<tr>
<td>Max</td>
<td>340.28235E36</td>
</tr>
<tr>
<td>Factory setting</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

#### p20259

**INT 0 integrating time constant in ms / INT 0 T_Integr ms**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sets the integrating time constant Ti in milliseconds of instance INT 0 of the integrator.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min</td>
<td>0.00</td>
</tr>
<tr>
<td>Max</td>
<td>340.28235E36</td>
</tr>
<tr>
<td>Factory setting</td>
<td>0.00</td>
</tr>
</tbody>
</table>

#### p20260

**BI: INT 0 accept setting value S / INT 0 acc set val**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sets the signal source for the &quot;accept setting value&quot; signal of instant INT 0 of the integrator.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min</td>
<td>-</td>
</tr>
<tr>
<td>Max</td>
<td>-</td>
</tr>
<tr>
<td>Factory setting</td>
<td>0</td>
</tr>
</tbody>
</table>

#### r20261

**CO: INT 0 output Y / INT 0 output Y**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Display parameter for output quantity Y of instance INT 0 of the integrator. If LL &gt;= LU, then the output quantity Y = LU.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min</td>
<td>-</td>
</tr>
<tr>
<td>Max</td>
<td>-</td>
</tr>
<tr>
<td>Factory setting</td>
<td>-</td>
</tr>
</tbody>
</table>
Parameter
List of parameters

r20262  BO: INT 0 integrator at the upper limit QU / INT 0 QU

Can be changed: -
Data type: Unsigned32
P-Group: -
Not for motor type: -

Description: Display parameter for the signal QU that output quantity Y of instance INT 0 of the integrator has reached the upper limit value LU.

Min Max Factory setting
- - -

r20263  BO: INT 0 integrator at the lower limit QL / INT 0 QL

Can be changed: -
Data type: Unsigned32
P-Group: -
Not for motor type: -

Description: Display parameter for the signal QL that output quantity Y of instance INT 0 of the integrator has reached the lower limit value LL.

Min Max Factory setting
- - -

p20264  INT 0 run-time group / INT 0 RTG

Can be changed: T
Data type: Integer16
P-Group: -
Not for motor type: -

Description: Setting parameter for the run-time group in which instance INT 0 of the integrator is to be called.

Value:
0: Run-time group 0
1: Run-time group 1
2: Run-time group 2
3: Run-time group 3
4: Run-time group 4
5: Run-time group 5
6: Run-time group 6
7: Run-time group 7
8: Run-time group 8
9: Run-time group 9
9999: Do not calculate

Min Max Factory setting
0 9999 9999
### List of parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>p20265 INT 0 run sequence / INT 0 RunSeq</td>
<td>Setting parameter for the run sequence of instance INT 0 within the run-time group set in p20264.</td>
<td>The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>p20266 CI: LVM 0 input X / LVM 0 input X</td>
<td>Sets the signal source of input quantity X of instance LVM 0 of the double-sided limiter.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>p20267 LVM 0 interval average value M / LVM 0 avg value M</td>
<td>Setting parameter for the interval average M of instance LVM 0 of the double-sided limiter.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>p20268 LVM 0 interval limit L / LVM 0 limit L</td>
<td>Setting parameter for the interval limit L of instance LVM 0 of the double-sided limiter.</td>
</tr>
<tr>
<td>Parameter</td>
<td>Description</td>
</tr>
<tr>
<td>-----------</td>
<td>-------------</td>
</tr>
<tr>
<td><strong>r20270</strong></td>
<td>BO: LVM 0 input quantity above interval QU / LVM 0 X above QU</td>
</tr>
<tr>
<td><strong>r20271</strong></td>
<td>BO: LVM 0 input quantity within interval QM / LVM 0 X within QM</td>
</tr>
<tr>
<td><strong>r20272</strong></td>
<td>BO: LVM 0 input quantity below interval QL / LVM 0 X below QL</td>
</tr>
</tbody>
</table>
**p20273**

**LVM 0 run-time group / LVM 0 RTG**

Can be changed: T  
Data type: Integer16  
P-Group: -  
Not for motor type: -

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0: Run-time group 0</td>
<td>Setting parameter for the run-time group in which instance LVM 0 of the double-sided limiter is to be called.</td>
<td>9999</td>
</tr>
<tr>
<td>1: Run-time group 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2: Run-time group 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3: Run-time group 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4: Run-time group 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5: Run-time group 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6: Run-time group 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7: Run-time group 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8: Run-time group 8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9: Run-time group 9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9999: Do not calculate</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**p20274**

**LVM 0 run sequence / LVM 0 RunSeq**

Can be changed: T  
Data type: Unsigned16  
P-Group: -  
Not for motor type: -

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0: Run-time group 0</td>
<td>Setting parameter for the run sequence of instance LVM 0 within the run-time group set in p20273.</td>
<td>720</td>
</tr>
<tr>
<td>1: Run-time group 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2: Run-time group 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3: Run-time group 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4: Run-time group 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5: Run-time group 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6: Run-time group 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7: Run-time group 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8: Run-time group 8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9: Run-time group 9</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**p20275**

**CI: LVM 1 input X / LVM 1 input X**

Can be changed: T  
Data type: Unsigned32 / FloatingPoint32  
P-Group: -  
Not for motor type: -

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>Sets the signal source of input quantity X of instance LVM 1 of the double-sided limiter.</td>
<td>0</td>
</tr>
</tbody>
</table>
### List of parameters

#### p20276
**LVM 1 interval average value M / LVM 1 avg value M**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Can be changed:</strong></td>
<td>T</td>
</tr>
<tr>
<td><strong>Data type:</strong></td>
<td>FloatingPoint32</td>
</tr>
<tr>
<td><strong>P-Group:</strong></td>
<td>-</td>
</tr>
<tr>
<td><strong>Not for motor type:</strong></td>
<td>-</td>
</tr>
<tr>
<td><strong>Access level:</strong></td>
<td>1</td>
</tr>
<tr>
<td><strong>Func. diagram:</strong></td>
<td>7270</td>
</tr>
<tr>
<td><strong>Units group:</strong></td>
<td>-</td>
</tr>
<tr>
<td><strong>Unit selection:</strong></td>
<td>-</td>
</tr>
<tr>
<td><strong>Expert list:</strong></td>
<td>1</td>
</tr>
</tbody>
</table>

**Description:** Setting parameter for the interval average M of instance LVM 1 of the double-sided limiter.

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-340.2823E36</td>
<td>340.2823E36</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

#### p20277
**LVM 1 interval limit L / LVM 1 limit L**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Can be changed:</strong></td>
<td>T</td>
</tr>
<tr>
<td><strong>Data type:</strong></td>
<td>FloatingPoint32</td>
</tr>
<tr>
<td><strong>P-Group:</strong></td>
<td>-</td>
</tr>
<tr>
<td><strong>Not for motor type:</strong></td>
<td>-</td>
</tr>
<tr>
<td><strong>Access level:</strong></td>
<td>1</td>
</tr>
<tr>
<td><strong>Func. diagram:</strong></td>
<td>7270</td>
</tr>
<tr>
<td><strong>Units group:</strong></td>
<td>-</td>
</tr>
<tr>
<td><strong>Unit selection:</strong></td>
<td>-</td>
</tr>
<tr>
<td><strong>Expert list:</strong></td>
<td>1</td>
</tr>
</tbody>
</table>

**Description:** Setting parameter for the interval limit L of instance LVM 1 of the double-sided limiter.

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-340.2823E36</td>
<td>340.2823E36</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

#### p20278
**LVM 1 hyst HY / LVM 1 hyst HY**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Can be changed:</strong></td>
<td>T</td>
</tr>
<tr>
<td><strong>Data type:</strong></td>
<td>FloatingPoint32</td>
</tr>
<tr>
<td><strong>P-Group:</strong></td>
<td>-</td>
</tr>
<tr>
<td><strong>Not for motor type:</strong></td>
<td>-</td>
</tr>
<tr>
<td><strong>Access level:</strong></td>
<td>1</td>
</tr>
<tr>
<td><strong>Func. diagram:</strong></td>
<td>7270</td>
</tr>
<tr>
<td><strong>Units group:</strong></td>
<td>-</td>
</tr>
<tr>
<td><strong>Unit selection:</strong></td>
<td>-</td>
</tr>
<tr>
<td><strong>Expert list:</strong></td>
<td>1</td>
</tr>
</tbody>
</table>

**Description:** Setting parameter for hysteresis HY of instance LVM 1 of the double-sided limiter.

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-340.2823E36</td>
<td>340.2823E36</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

#### r20279
**BO: LVM 1 input quantity above interval QU / LVM 1 X above QU**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Can be changed:</strong></td>
<td>-</td>
</tr>
<tr>
<td><strong>Data type:</strong></td>
<td>Unsigned32</td>
</tr>
<tr>
<td><strong>P-Group:</strong></td>
<td>-</td>
</tr>
<tr>
<td><strong>Not for motor type:</strong></td>
<td>-</td>
</tr>
<tr>
<td><strong>Access level:</strong></td>
<td>1</td>
</tr>
<tr>
<td><strong>Func. diagram:</strong></td>
<td>7270</td>
</tr>
<tr>
<td><strong>Units group:</strong></td>
<td>-</td>
</tr>
<tr>
<td><strong>Unit selection:</strong></td>
<td>-</td>
</tr>
<tr>
<td><strong>Expert list:</strong></td>
<td>1</td>
</tr>
</tbody>
</table>

**Description:** Display parameter of instance LVM 1 of the double-sided limiter that input quantity X was at least once X > M + L and X is >> M + L - HY.
### r20280

**BO: LVM 1 input quantity within interval QM / LVM 1 X within QM**

<table>
<thead>
<tr>
<th>Description</th>
<th>Can be changed:</th>
<th>Data type: Unsigned32</th>
<th>P-Group:</th>
<th>Not for motor type:</th>
<th>Access level: 1</th>
<th>Func. diagram: 7270</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display parameter of instance LVM 1 of the double-sided limiter that the input quantity X lies within the interval.</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

#### Settings

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

### r20281

**BO: LVM 1 input quantity below interval QL / LVM 1 X below QL**

<table>
<thead>
<tr>
<th>Description</th>
<th>Can be changed:</th>
<th>Data type: Unsigned32</th>
<th>P-Group:</th>
<th>Not for motor type:</th>
<th>Access level: 1</th>
<th>Func. diagram: 7270</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display parameter of instance LVM 1 of the double-sided limiter that input quantity X was at least once X &lt; M - L and X is &lt;= M - L + HY.</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

#### Settings

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

### p20282

**LVM 1 run-time group / LVM 1 RTG**

<table>
<thead>
<tr>
<th>Description</th>
<th>Can be changed:</th>
<th>Data type: Integer16</th>
<th>P-Group:</th>
<th>Not for motor type:</th>
<th>Access level: 1</th>
<th>Func. diagram: 7270</th>
</tr>
</thead>
<tbody>
<tr>
<td>Setting parameter for the run-time group in which instance LVM 1 of the double-sided limiter is to be called.</td>
<td>T</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

#### Settings

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>9999</td>
<td>9999</td>
</tr>
</tbody>
</table>

**Value:**

- 0: Run-time group 0
- 1: Run-time group 1
- 2: Run-time group 2
- 3: Run-time group 3
- 4: Run-time group 4
- 5: Run-time group 5
- 6: Run-time group 6
- 7: Run-time group 7
- 8: Run-time group 8
- 9: Run-time group 9
- 9999: Do not calculate
## Parameter List of parameters

### p20283
**LVM 1 run sequence / LVM 1 RunSeq**
- **CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)**
- **Can be changed:** T
- **Data type:** Unsigned16
- **P-Group:** -
- **Not for motor type:** -
- **Min:** 0
- **Max:** 7999
- **Factory setting:** 730
- **Description:** Setting parameter for the run sequence of instance LVM within the run-time group set in p20282.
- **Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

### p20284
**Cl: DIF 0 input X / DIF 0 input X**
- **CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)**
- **Can be changed:** T
- **Data type:** Unsigned32 / FloatingPoint32
- **P-Group:** -
- **Not for motor type:** -
- **Min:** -
- **Max:** 0
- **Factory setting:** -
- **Description:** Sets the signal source of input quantity X of instance DIF 0 of the differentiating element.

### p20285
**DIF 0 differentiating time constant in ms / DIF 0 T_diff ms**
- **CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)**
- **Can be changed:** T
- **Data type:** FloatingPoint32
- **P-Group:** -
- **Not for motor type:** -
- **Min:** 0.00
- **Max:** 340.28235E36
- **Factory setting:** 0.00
- **Description:** Sets the differentiating time constant Td in milliseconds of instance DIF 0 of the differentiating element.

### r20286
**CO: DIF 0 output Y / DIF 0 output Y**
- **CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)**
- **Can be changed:** -
- **Data type:** FloatingPoint32
- **P-Group:** -
- **Not for motor type:** -
- **Min:** -
- **Max:** -
- **Factory setting:** -
- **Description:** Display parameter for output quantity Y of instance DIF 0 of the differentiating element.
### p20287  DIF 0 run-time group / DIF 0 RTG

**CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)**

- **Can be changed:** T
- **Data type:** Integer16
- **Not for motor type:** -
- **Calculated:** -
- **Dynamic index:** -
- **Units group:** -
- **Scaling:** -
- **Access level:** 1
- **Func. diagram:** 7264
- **Unit selection:** -
- **Expert list:** 1

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>9999</td>
<td>9999</td>
</tr>
</tbody>
</table>

**Description:** Setting parameter for the run-time group in which instance DIF 0 of the differentiating element is to be called.

**Value:**
- 0: Run-time group 0
- 1: Run-time group 1
- 2: Run-time group 2
- 3: Run-time group 3
- 4: Run-time group 4
- 5: Run-time group 5
- 6: Run-time group 6
- 7: Run-time group 7
- 8: Run-time group 8
- 9: Run-time group 9
- 9999: Do not calculate

### p20288  DIF 0 run sequence / DIF 0 RunSeq

**CU_S110-CAN, CU_S110-DP, CU_S110-PN, SERVO_S110-CAN (FBLOCKS), SERVO_S110-DP (FBLOCKS), SERVO_S110-PN (FBLOCKS)**

- **Can be changed:** T
- **Data type:** Unsigned16
- **Not for motor type:** -
- **Calculated:** -
- **Dynamic index:** -
- **Units group:** -
- **Scaling:** -
- **Access level:** 1
- **Func. diagram:** 7264
- **Unit selection:** -
- **Expert list:** 1

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
<th>Factory setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>32000</td>
<td>750</td>
</tr>
</tbody>
</table>

**Description:** Setting parameter for the run sequence of instance DIF 0 within the run-time group set in p20287.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

### r61000[0...239]  PROFINET Name of Station / PN Name of Station

**CU_S110-PN**

- **Can be changed:** -
- **Data type:** Unsigned8
- **Not for motor type:** -
- **Calculated:** -
- **Dynamic index:** -
- **Units group:** -
- **Scaling:** -
- **Access level:** 3
- **Func. diagram:** -
- **Unit selection:** -
- **Expert list:** 1
- **Min**
- **Max**
- **Factory setting**

**Description:** Displays PROFINET Name of Station.

**Notice:** An ASCII table (excerpt) can be found, for example, in the appendix to the List Manual.
### Parameter List of parameters

<table>
<thead>
<tr>
<th>r61001[0...3]</th>
<th>PROFINET IP of Station / PN IP of Station</th>
</tr>
</thead>
<tbody>
<tr>
<td>CU_S110-PN</td>
<td>Can be changed: -</td>
</tr>
<tr>
<td></td>
<td>Calculated: -</td>
</tr>
<tr>
<td></td>
<td>Access level: 3</td>
</tr>
<tr>
<td></td>
<td>Data type: Unsigned8</td>
</tr>
<tr>
<td></td>
<td>Dynamic index: -</td>
</tr>
<tr>
<td></td>
<td>Func. diagram: -</td>
</tr>
<tr>
<td></td>
<td>P-Group: -</td>
</tr>
<tr>
<td></td>
<td>Units group: -</td>
</tr>
<tr>
<td></td>
<td>Unit selection: -</td>
</tr>
<tr>
<td></td>
<td>Not for motor type: -</td>
</tr>
<tr>
<td></td>
<td>Scaling: -</td>
</tr>
<tr>
<td></td>
<td>Expert list: 1</td>
</tr>
<tr>
<td></td>
<td>Min</td>
</tr>
<tr>
<td></td>
<td>Max</td>
</tr>
<tr>
<td></td>
<td>Factory setting</td>
</tr>
<tr>
<td></td>
<td>-</td>
</tr>
</tbody>
</table>

**Description:** Displays PROFINET IP of Station.
1.3 Parameters for data sets

1.3.1 Parameters for command data sets (CDS)

Note:

Chapter "Data sets"

The following list contains the parameters that are dependent on the command data sets.

Product: S110, Version: 4402100, Language: eng, Type: CDS

- p0820[n...n] BI: Drive Data Set selection DDS bit 0 / DDS select., bit 0
- p0828[n...n] BI: Motor changeover, feedback signal / Mot_chg_fbkd sig
- p0840[n...n] BI: ON / OFF (OFF1) / ON / OFF (OFF1)
- p0844[n...n] BI: No coast-down / coast-down (OFF2) signal source 1 / OFF2 S_src 1
- p0845[n...n] BI: No coast-down / coast-down (OFF2) signal source 2 / OFF2 S_src 2
- p0848[n...n] BI: No Quick Stop / Quick Stop (OFF3) signal source 1 / OFF3 S_src 1
- p0849[n...n] BI: No Quick Stop / Quick Stop (OFF3) signal source 2 / OFF3 S_src 2
- p0852[n...n] BI: Enable operation/inhibit operation / Operation enable
- p0854[n...n] BI: Control by PLC/no control by PLC / Master ctrl by PLC
- p0855[n...n] BI: Unconditionally release holding brake / Uncond open brake
- p0856[n...n] BI: Speed controller enable / n_ctrl enable
- p0858[n...n] BI: Unconditionally close holding brake / Uncond close brake
- p1020[n...n] BI: Fixed speed setpoint selection Bit 0 / n_set_fixed Bit 0
- p1021[n...n] BI: Fixed speed setpoint selection Bit 1 / n_set_fixed Bit 1
- p1022[n...n] BI: Fixed speed setpoint selection Bit 2 / n_set_fixed Bit 2
- p1023[n...n] BI: Fixed speed setpoint selection Bit 3 / n_set_fixed Bit 3
- p1035[n...n] BI: Motorized potentiometer setpoint raise / Mop raise
- p1036[n...n] BI: Motorized potentiometer lower setpoint / Mop lower
- p1039[n...n] BI: Motorized potentiometer inversion / MotP inv
- p1041[n...n] BI: Motorized potentiometer manual/automatic / Mop manual/auto
- p1042[n...n] CI: Motorized potentiometer automatic setpoint / Mop auto setpoint
- p1043[n...n] BI: Motorized potentiometer accept setting value / MotP acc set val
- p1044[n...n] CI: Motorized potentiometer setting value / Mop set val
- p1051[n...n] CI: Speed limit RFG positive direction of rotation / n_limit RFG pos
- p1052[n...n] CI: Speed limit RFG negative direction of rotation / n_limit RFG neg
- p1055[n...n] BI: Jog bit 0 / Jog bit 0
- p1056[n...n] BI: Jog bit 1 / Jog bit 1
- p1070[n...n] CI: Main setpoint / Main setpoint
- p1071[n...n] CI: Main setpoint scaling / Main setp scal
- p1075[n...n] CI: Suppl setpoint / Suppl setpoint
- p1076[n...n] CI: Supplementary setpoint scaling / Suppl setp scal
- p1085[n...n] CI: Speed limit in positive direction of rotation / n_limit pos
- p1088[n...n] CI: Speed limit in negative direction of rotation / n_limit neg
- p1110[n...n] BI: Inhibit negative direction / Inhib neg dir
- p1111[n...n] BI: Inhibit positive direction / Inhib pos dir
- p1113[n...n] BI: Setpoint inversion / Setp inv
- p1122[n...n] BI: Bypass ramp-function generator / Bypass RFG
- p1140[n...n] BI: Enable ramp-function generator/inhibit ramp-function generator / RFG enable
### Parameters for data sets

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>p1141[0...n]</td>
<td>BI: Continue ramp-function generator/freeze ramp-function generator / Continue RFG</td>
</tr>
<tr>
<td>p1142[0...n]</td>
<td>BI: Enable setpoint/inhibit setpoint / Setpoint enable</td>
</tr>
<tr>
<td>p1143[0...n]</td>
<td>BI: Ramp-function generator, accept setting value / RFG accept set v</td>
</tr>
<tr>
<td>p1144[0...n]</td>
<td>CI: Ramp-function generator setting value / RFG setting value</td>
</tr>
<tr>
<td>p1155[0...n]</td>
<td>CI: Speed controller speed setpoint 1 / n_ctrl n_set 1</td>
</tr>
<tr>
<td>p1160[0...n]</td>
<td>CI: Speed controller speed setpoint 2 / n_ctrl n_set 2</td>
</tr>
<tr>
<td>p1230[0...n]</td>
<td>BI: Armature short-circuit / DC braking activation / ASC/DCBRK act</td>
</tr>
<tr>
<td>p1235[0...n]</td>
<td>BI: External armature short-circuit, contactor feedback signal / ASC ext feedback</td>
</tr>
<tr>
<td>p1430[0...n]</td>
<td>CI: Speed pre-control / n_precntl</td>
</tr>
<tr>
<td>p1455[0...n]</td>
<td>CI: Speed controller P gain adaptation signal / n_ctrl Adpt_sig Kp</td>
</tr>
<tr>
<td>p1466[0...n]</td>
<td>CI: Speed controller P-gain scaling / n_ctrl Kp scal</td>
</tr>
<tr>
<td>p1476[0...n]</td>
<td>BI: Armature short-circuit / DC braking activation / ASC/DCBRK act</td>
</tr>
<tr>
<td>p1477[0...n]</td>
<td>BI: Speed controller set integrator value / n_ctrl integ set</td>
</tr>
<tr>
<td>p1478[0...n]</td>
<td>CI: Speed controller integrator setting value / n_ctr integ_setVal</td>
</tr>
<tr>
<td>p1497[0...n]</td>
<td>CI: Moment of inertia, scaling / M_mom inert scal</td>
</tr>
<tr>
<td>p1501[0...n]</td>
<td>BI: Change over between closed-loop speed/torque control / Changeov n/M_ctrl</td>
</tr>
<tr>
<td>p1502[0...n]</td>
<td>BI: Freeze moment of inertia estimator / J_estim freeze</td>
</tr>
<tr>
<td>p1511[0...n]</td>
<td>CI: Supplementary torque 1 / M_suppl 1</td>
</tr>
<tr>
<td>p1512[0...n]</td>
<td>CI: Supplementary torque 1 scaling / M_suppl 1 scal</td>
</tr>
<tr>
<td>p1513[0...n]</td>
<td>CI: Supplementary torque 2 / M_suppl 2</td>
</tr>
<tr>
<td>p1522[0...n]</td>
<td>CI: Torque limit upper/motorizing / M_max upper/mot</td>
</tr>
<tr>
<td>p1523[0...n]</td>
<td>CI: Torque limit lower/regenerative / M_max lower/regen</td>
</tr>
<tr>
<td>p1528[0...n]</td>
<td>CI: Torque limit upper/motorizing scaling / M_max up/mot scal</td>
</tr>
<tr>
<td>p1529[0...n]</td>
<td>CI: Torque limit lower/regenerative scaling / M_max low/gen scal</td>
</tr>
<tr>
<td>p1542[0...n]</td>
<td>CI: Travel to fixed stop torque reduction / TIS M_red</td>
</tr>
<tr>
<td>p1545[0...n]</td>
<td>BI: Activates travel to a fixed stop / TIS activation</td>
</tr>
<tr>
<td>p1550[0...n]</td>
<td>BI: Transfer actual torque as torque offset / Accept act torque</td>
</tr>
<tr>
<td>p1551[0...n]</td>
<td>BI: Torque limit variable/fixed signal source / M_lim var/fixS_src</td>
</tr>
<tr>
<td>p1552[0...n]</td>
<td>CI: Torque limit upper scaling without offset / M_max up w/o offs</td>
</tr>
<tr>
<td>p1554[0...n]</td>
<td>CI: Torque limit lower scaling without offset / M_max low w/o offs</td>
</tr>
<tr>
<td>p1569[0...n]</td>
<td>CI: Supplementary torque 3 / M_suppl 3</td>
</tr>
<tr>
<td>p2103[0...n]</td>
<td>BI: 1. Acknowledge faults / 1. Acknowledge</td>
</tr>
<tr>
<td>p2104[0...n]</td>
<td>BI: 2. Acknowledge faults / 2. Acknowledge</td>
</tr>
<tr>
<td>p2105[0...n]</td>
<td>BI: 3. Acknowledge faults / 3. Acknowledge</td>
</tr>
<tr>
<td>p2106[0...n]</td>
<td>BI: External fault 1 / External fault 1</td>
</tr>
<tr>
<td>p2107[0...n]</td>
<td>BI: External fault 2 / External fault 2</td>
</tr>
<tr>
<td>p2108[0...n]</td>
<td>BI: External fault 3 / External fault 3</td>
</tr>
<tr>
<td>p2112[0...n]</td>
<td>BI: External alarm 1 / External alarm 1</td>
</tr>
<tr>
<td>p2116[0...n]</td>
<td>BI: External alarm 2 / External alarm 2</td>
</tr>
<tr>
<td>p2117[0...n]</td>
<td>BI: External alarm 3 / External alarm 3</td>
</tr>
<tr>
<td>p2144[0...n]</td>
<td>BI: Motor stall monitoring enable (negated) / Mot stall enab neg</td>
</tr>
<tr>
<td>p2148[0...n]</td>
<td>BI: RFG active / RFG active</td>
</tr>
<tr>
<td>p2151[0...n]</td>
<td>CI: Speed setpoint for messages/signals / n_set for msg</td>
</tr>
<tr>
<td>p2154[0...n]</td>
<td>CI: Speed setpoint 2 / n_set 2</td>
</tr>
<tr>
<td>p2200[0...n]</td>
<td>BI: Technology controller enable / Tec_ctrl enable</td>
</tr>
<tr>
<td>p2220[0...n]</td>
<td>BI: Technology controller fixed value selection bit 0 / Tec_ctrl sel bit 0</td>
</tr>
<tr>
<td>p2221[0...n]</td>
<td>BI: Technology controller fixed value selection bit 1 / Tec_ctrl sel bit 1</td>
</tr>
<tr>
<td>p2222[0...n]</td>
<td>BI: Technology controller fixed value selection bit 2 / Tec_ctrl sel bit 2</td>
</tr>
<tr>
<td>p2223[0...n]</td>
<td>BI: Technology controller fixed value selection bit 3 / Tec_ctrl sel bit 3</td>
</tr>
<tr>
<td>p2235[0...n]</td>
<td>BI: Technology controller motorized potentiometer raise setpoint / Tec_ctrl mop raise</td>
</tr>
<tr>
<td>p2236[0...n]</td>
<td>BI: Technology controller motorized potentiometer lower setpoint / Tec_ctrl mop lower</td>
</tr>
<tr>
<td>p2253[0...n]</td>
<td>CI: Technology controller setpoint 1 / Tec_ctrl setp 1</td>
</tr>
<tr>
<td>p2254[0...n]</td>
<td>CI: Technology controller setpoint 2 / Tec_ctrl setp 2</td>
</tr>
</tbody>
</table>
## Parameters for drive data sets (DDS)

Note:

Chapter "Data sets"

The following list contains the parameters that are dependent on the drive data sets.

- **Motor Data Sets (MDS) number** / MDS number
- **Encoder 1 encoder data set number** / Enc 1 EDS number
- **Encoder 2 encoder data set number** / Enc 2 EDS number
- **Automatic calculation, motor/control parameters** / Calc auto par
- **Activate inhibit list** / Act inhib list
- **Calculate technology-dependent parameters** / Calc tec par
- **Current limit** / Current limit
- **Encoderless operation current reduction** / Encoderl op I_red
- **Fixed speed setpoint 1** / n_set_fixed 1
- **Fixed speed setpoint 2** / n_set_fixed 2
- **Fixed speed setpoint 3** / n_set_fixed 3
- **Fixed speed setpoint 4** / n_set_fixed 4
- **Fixed speed setpoint 5** / n_set_fixed 5
- **Fixed speed setpoint 6** / n_set_fixed 6
- **Fixed speed setpoint 7** / n_set_fixed 7
- **Fixed speed setpoint 8** / n_set_fixed 8
- **Fixed speed setpoint 9** / n_set_fixed 9
- **Fixed speed setpoint 10** / n_set_fixed 10
- **Fixed speed setpoint 11** / n_set_fixed 11
- **Fixed speed setpoint 12** / n_set_fixed 12
- **Fixed speed setpoint 13** / n_set_fixed 13
- **Fixed speed setpoint 14** / n_set_fixed 14
- **Fixed speed setpoint 15** / n_set_fixed 15
- **Motorized potentiometer configuration** / Mop configuration
- **Motorized potentiometer maximum speed** / MotP n_max
- **Motorized potentiometer minimum speed** / MotP n_min
- **Motorized potentiometer starting value** / Mop start value
- **Motorized potentiometer ramp-up time** / Mop ramp-up time
- **Motorized potentiometer ramp-down time** / Mop ramp-down time
- **Jog 1 speed setpoint** / Jog 1 n_set
- **Jog 2 speed setpoint** / Jog 2 n_set
- **Speed limit setpoint channel** / n_limit setp
- **Minimum speed** / n_min
### Parameters for data sets

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>p1082[0...n]</td>
<td>Maximum speed / n_max</td>
</tr>
<tr>
<td>p1083[0...n]</td>
<td>CO: Speed limit in positive direction of rotation / n_limit pos</td>
</tr>
<tr>
<td>p1086[0...n]</td>
<td>CO: Speed limit in negative direction of rotation / n_limit_neg</td>
</tr>
<tr>
<td>p1091[0...n]</td>
<td>Skip speed 1 / n_skip 1</td>
</tr>
<tr>
<td>p1092[0...n]</td>
<td>Skip speed 2 / n_skip 2</td>
</tr>
<tr>
<td>p1093[0...n]</td>
<td>Skip speed 3 / n_skip 3</td>
</tr>
<tr>
<td>p1094[0...n]</td>
<td>Skip speed 4 / n_skip 4</td>
</tr>
<tr>
<td>p1101[0...n]</td>
<td>Skip speed bandwidth / n_skip bandwidth</td>
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<tr>
<td>p1120[0...n]</td>
<td>Ramp-function generator ramp-up time / RFG ramp-up time</td>
</tr>
<tr>
<td>p1121[0...n]</td>
<td>Ramp-function generator ramp-down time / RFG ramp-down time</td>
</tr>
<tr>
<td>p1130[0...n]</td>
<td>Ramp-function generator initial rounding-off time / RFG t_start_round</td>
</tr>
<tr>
<td>p1131[0...n]</td>
<td>Ramp-function generator final rounding-off time / RFG t_end_delay</td>
</tr>
<tr>
<td>p1134[0...n]</td>
<td>Ramp-function generator rounding-off type / RFG round-off type</td>
</tr>
<tr>
<td>p1135[0...n]</td>
<td>OFF3 ramp-down time / OFF3 t_RD</td>
</tr>
<tr>
<td>p1136[0...n]</td>
<td>OFF3 initial rounding-off time / RFG OFF3 t_strt_rnd</td>
</tr>
<tr>
<td>p1137[0...n]</td>
<td>OFF3 final rounding-off time / RFG OFF3 t_end_del</td>
</tr>
<tr>
<td>p1145[0...n]</td>
<td>Ramp-function generator tracking intensity / RFG track intens</td>
</tr>
<tr>
<td>p1148[0...n]</td>
<td>Ramp-function generator configuration / RFG config</td>
</tr>
<tr>
<td>p1189[0...n]</td>
<td>Speed setpoint configuration / n_ctrl config</td>
</tr>
<tr>
<td>p1192[0...n]</td>
<td>DSC enc selection / DSC enc selection</td>
</tr>
<tr>
<td>p1193[0...n]</td>
<td>DSC encoder adaptation factor / DSC encAdaptFact</td>
</tr>
<tr>
<td>p1226[0...n]</td>
<td>Threshold for zero speed detection / n_standst n_thresh</td>
</tr>
<tr>
<td>p1240[0...n]</td>
<td>Vdc controller or Vdc monitoring configuration / Vdc_ctrl config</td>
</tr>
<tr>
<td>p1244[0...n]</td>
<td>DC link voltage threshold upper / Vdc upper thresh</td>
</tr>
<tr>
<td>p1248[0...n]</td>
<td>DC link voltage threshold lower / Vdc lower thresh</td>
</tr>
<tr>
<td>p1250[0...n]</td>
<td>Vdc controller proportional gain / Vdc_ctrl Kp</td>
</tr>
<tr>
<td>p1300[0...n]</td>
<td>Open-loop/closed-loop control operating mode / Op/cl-lp ctrl_mode</td>
</tr>
<tr>
<td>p1317[0...n]</td>
<td>U/f control activation / Uf act</td>
</tr>
<tr>
<td>p1318[0...n]</td>
<td>U/f control ramp-up/ramp-down time / Uf t_rmp-up_rmp-dn</td>
</tr>
<tr>
<td>p1319[0...n]</td>
<td>U/f control voltage at zero frequency / Uf U at f=0 Hz</td>
</tr>
<tr>
<td>p1326[0...n]</td>
<td>U/f control characteristic frequency / Uf char f4</td>
</tr>
<tr>
<td>p1327[0...n]</td>
<td>U/f control characteristic voltage / Uf char U4</td>
</tr>
<tr>
<td>p1338[0...n]</td>
<td>U/f mode resonance damping gain / Uf Res_damp gain</td>
</tr>
<tr>
<td>p1339[0...n]</td>
<td>U/f mode resonance damping filter time constant / Uf Res_damp T</td>
</tr>
<tr>
<td>p1345[0...n]</td>
<td>DC braking proportional gain / DCBRK Kp</td>
</tr>
<tr>
<td>p1346[0...n]</td>
<td>DC braking, integral time / DCBRK Tn</td>
</tr>
<tr>
<td>p1349[0...n]</td>
<td>U/f mode resonance damping maximum frequency / Uf res_damp f_max</td>
</tr>
<tr>
<td>p1400[0...n]</td>
<td>Speed control configuration / n_ctrl config</td>
</tr>
<tr>
<td>p1402[0...n]</td>
<td>Closed-loop current control and motor model configuration / l_ctrl config</td>
</tr>
<tr>
<td>p1404[0...n]</td>
<td>Encoderless operation changeover speed / Encoderl op n_chg</td>
</tr>
<tr>
<td>p1414[0...n]</td>
<td>Speed setpoint filter activation / n_set_filt act</td>
</tr>
<tr>
<td>p1415[0...n]</td>
<td>Speed setpoint filter 1 type / n_set_filt 1 typ</td>
</tr>
<tr>
<td>p1416[0...n]</td>
<td>Speed setpoint filter 1 time constant / n_set_filt 1 T</td>
</tr>
<tr>
<td>p1417[0...n]</td>
<td>Speed setpoint filter 1 denominator natural frequency / n_set_filt 1 fn_d</td>
</tr>
<tr>
<td>p1418[0...n]</td>
<td>Speed setpoint filter 1 denominator damping / n_set_filt 1 D_d</td>
</tr>
<tr>
<td>p1419[0...n]</td>
<td>Speed setpoint filter 1 numerator natural frequency / n_set_filt 1 fn_n</td>
</tr>
<tr>
<td>p1420[0...n]</td>
<td>Speed setpoint filter 1 numerator damping / n_set_filt 1 D_n</td>
</tr>
<tr>
<td>p1428[0...n]</td>
<td>Speed pre-control balancing dead time / n_prectrBal t_dead</td>
</tr>
<tr>
<td>p1429[0...n]</td>
<td>Speed pre-control balancing time constant / n_prectr bal T</td>
</tr>
<tr>
<td>p1433[0...n]</td>
<td>Speed controller reference model natural frequency / n_ctrl RefMod fn</td>
</tr>
<tr>
<td>p1434[0...n]</td>
<td>Speed controller reference model damping / n_ctrl RefMod D</td>
</tr>
<tr>
<td>p1435[0...n]</td>
<td>Speed controller reference model dead time / n_ctrlRefMod t_dead</td>
</tr>
</tbody>
</table>
### Parameters for data sets

- **p1441[0...n]**: Actual speed smoothing time / n_act T_smooth
- **p1451[0...n]**: Speed actual value smoothing time sensorless / n_act t_sm SL
- **p1456[0...n]**: Speed controller P gain adaptation lower starting point / n_ctrl AdaptKpLow
- **p1457[0...n]**: Speed controller P gain adaptation upper starting point / n_ctrl AdaptKp up
- **p1458[0...n]**: Adaptation factor, lower / Adapt_factor lower
- **p1459[0...n]**: Adaptation factor, upper / Adapt_factor upper
- **p1460[0...n]**: Speed controller P gain adaptation speed, lower / n_ctrl Kp n lower
- **p1461[0...n]**: Speed controller Kp adaptation speed, upper scaling / n_ctrl Kp n upper
- **p1462[0...n]**: Speed controller integral time adaptation speed lower / n_ctrl Tn n lower
- **p1463[0...n]**: Speed controller Tn adaptation speed, upper scaling / n_ctrl Tn n upper
- **p1464[0...n]**: Speed controller adaptation speed, lower / n_ctrl n lower
- **p1465[0...n]**: Speed controller adaptation speed, upper / n_ctrl n upper
- **p1470[0...n]**: Speed controller encoderless operation P-gain / n_ctrl SLVC Kp
- **p1472[0...n]**: Speed controller encoderless operation integral time / n_ctrl SLVC Tn
- **p1494[0...n]**: Speed controller integrator feedback time constant / n_ctr integ_fdbk T
- **p1498[0...n]**: Load moment of inertia / Load mom of inert
- **p1517[0...n]**: Accelerating torque smoothing time constant / M_accel T_smooth
- **p1520[0...n]**: CO: Torque limit upper/motoring / M_max upper/mot
- **p1521[0...n]**: CO: Torque limit lower/regenerative / M_max lower/regen
- **p1524[0...n]**: CO: Torque limit upper/motoring scaling / M_max up/mot scal
- **p1525[0...n]**: CO: Torque limit lower/regenerative scaling / M_max low/gen scal
- **p1530[0...n]**: Power limit motoring / P_max mot
- **p1531[0...n]**: Power limit regenerative / P_max gen
- **p1532[0...n]**: CO: Torque limit offset / M_max offset
- **p1578[0...n]**: Flux reduction flux decrease smoothing time / Flux red dec t_sm
- **p1579[0...n]**: Flux reduction flux build-up smoothing time / Flux red up t_sm
- **p1581[0...n]**: Flux reduction factor / Flux red factor
- **p1585[0...n]**: Flux actual value, smoothing time / Flux actVal T_smth
- **p1590[0...n]**: Flux controller P gain / Flux controller Kp
- **p1592[0...n]**: Flux controller integral time / Flux controller Tn
- **p1612[0...n]**: Current setpoint, open-loop control, encoderless / I_setp_filt act
- **p1656[0...n]**: Activates current setpoint filter / I_setp_filt act
- **p1657[0...n]**: Current setpoint filter 1 type / I_setp_filt 1 Typ
- **p1658[0...n]**: Current setpoint filter 1 denominator natural frequency / I_setp_filt 1 fn_n
- **p1659[0...n]**: Current setpoint filter 1 denominator damping / I_setp_filt 1 D_n
- **p1660[0...n]**: Current setpoint filter 1 numerator natural frequency / I_setp_filt 1 fn_z
- **p1661[0...n]**: Current setpoint filter 1 numerator damping / I_setp_filt 1 D_z
- **p1662[0...n]**: Current setpoint filter 2 type / I_setp_filt 2 Typ
- **p1663[0...n]**: Current setpoint filter 2 denominator natural frequency / I_setp_filt 2 fn_n
- **p1664[0...n]**: Current setpoint filter 2 denominator damping / I_setp_filt 2 D_n
- **p1665[0...n]**: Current setpoint filter 2 numerator natural frequency / I_setp_filt 2 fn_z
- **p1666[0...n]**: Current setpoint filter 2 numerator damping / I_setp_filt 2 D_z
- **p1701[0...n]**: Current controller reference model dead time / I_ctrRefMod t_dead
- **p1715[0...n]**: Current controller P gain / I_ctrl Kp
- **p1717[0...n]**: Current controller integral-action time / I_ctrl Tn
- **p1752[0...n]**: Motor model changeover speed operation with encoder / MotMod n_chgGov enc
- **p1755[0...n]**: Motor model changeover speed encoderless operation / MotMod n_chgSnsOrl
- **p1800[0...n]**: Pulse frequency setpoint / Pulse freq setp
- **p1821[0...n]**: Dir of rot / Dir of rot
- **p2140[0...n]**: Hysteresis speed 2 / n_hysteresis 2
- **p2141[0...n]**: Speed threshold 1 / n_thresh val 1
- **p2142[0...n]**: Hysteresis speed 1 / n_hysteresis 1
- **p2149[0...n]**: Monitoring configuration / Monit config
### Parameter

#### Parameters for data sets

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>p2150[0...n]</td>
<td>Hysteresis speed 3 / n_hysteresis 3</td>
</tr>
<tr>
<td>p2153[0...n]</td>
<td>Speed actual value filter time constant / n_act_filt T</td>
</tr>
<tr>
<td>p2155[0...n]</td>
<td>Speed threshold 2 / n_thresh val 2</td>
</tr>
<tr>
<td>p2156[0...n]</td>
<td>On delay, comparison value reached / t_on cmpr val rchd</td>
</tr>
<tr>
<td>p2161[0...n]</td>
<td>Speed threshold 3 / n_thresh val 3</td>
</tr>
<tr>
<td>p2162[0...n]</td>
<td>Hysteresis speed n_act &gt; n_max / Hyst n_act&gt;n_max</td>
</tr>
<tr>
<td>p2163[0...n]</td>
<td>Speed threshold 4 / n_thresh val 4</td>
</tr>
<tr>
<td>p2164[0...n]</td>
<td>Hysteresis speed 4 / n_hysteresis 4</td>
</tr>
<tr>
<td>p2166[0...n]</td>
<td>Off delay n_act = n_set / t_del_off n_i=n_so</td>
</tr>
<tr>
<td>p2167[0...n]</td>
<td>Switch-on delay n_act = n_set / t_on n_act=n_set</td>
</tr>
<tr>
<td>p2174[0...n]</td>
<td>Torque threshold value 1 / M_thresh val 1</td>
</tr>
<tr>
<td>p2175[0...n]</td>
<td>Motor locked speed threshold / Mot lock n_thresh</td>
</tr>
<tr>
<td>p2177[0...n]</td>
<td>Motor locked delay time / Mot lock t_del</td>
</tr>
<tr>
<td>p2181[0...n]</td>
<td>Load monitoring response / Load monit resp</td>
</tr>
<tr>
<td>p2182[0...n]</td>
<td>Load monitoring speed threshold value 1 / n_thresh 1</td>
</tr>
<tr>
<td>p2183[0...n]</td>
<td>Load monitoring speed threshold value 2 / n_thresh 2</td>
</tr>
<tr>
<td>p2184[0...n]</td>
<td>Load monitoring speed threshold value 3 / n_thresh 3</td>
</tr>
<tr>
<td>p2185[0...n]</td>
<td>Load monitoring torque threshold 1, upper / M_thresh 1 upper</td>
</tr>
<tr>
<td>p2186[0...n]</td>
<td>Load monitoring torque threshold 1, lower / M_thresh 1 lower</td>
</tr>
<tr>
<td>p2187[0...n]</td>
<td>Load monitoring torque threshold 2, upper / M_thresh 2 upper</td>
</tr>
<tr>
<td>p2188[0...n]</td>
<td>Load monitoring torque threshold 2, lower / M_thresh 2 lower</td>
</tr>
<tr>
<td>p2189[0...n]</td>
<td>Load monitoring torque threshold 3, upper / M_thresh 3 upper</td>
</tr>
<tr>
<td>p2190[0...n]</td>
<td>Load monitoring torque threshold 3, lower / M_thresh 3 lower</td>
</tr>
<tr>
<td>p2192[0...n]</td>
<td>Load monitoring delay time / Load monit t_del</td>
</tr>
<tr>
<td>p2194[0...n]</td>
<td>Torque threshold value 2 / M_thresh val 2</td>
</tr>
<tr>
<td>p2195[0...n]</td>
<td>Torque utilization switch-off delay / M_util t_off</td>
</tr>
<tr>
<td>p2196[0...n]</td>
<td>Torque utilization scaling / M_util scal</td>
</tr>
<tr>
<td>p2201[0...n]</td>
<td>CO: Technology controller, fixed value 1 / Tec_ctr fix val 1</td>
</tr>
<tr>
<td>p2202[0...n]</td>
<td>CO: Technology controller, fixed value 2 / Tec_ctr fix val 2</td>
</tr>
<tr>
<td>p2203[0...n]</td>
<td>CO: Technology controller, fixed value 3 / Tec_ctr fix val 3</td>
</tr>
<tr>
<td>p2204[0...n]</td>
<td>CO: Technology controller, fixed value 4 / Tec_ctr fix val 4</td>
</tr>
<tr>
<td>p2205[0...n]</td>
<td>CO: Technology controller, fixed value 5 / Tec_ctr fix val 5</td>
</tr>
<tr>
<td>p2206[0...n]</td>
<td>CO: Technology controller, fixed value 6 / Tec_ctr fix val 6</td>
</tr>
<tr>
<td>p2207[0...n]</td>
<td>CO: Technology controller, fixed value 7 / Tec_ctr fix val 7</td>
</tr>
<tr>
<td>p2208[0...n]</td>
<td>CO: Technology controller, fixed value 8 / Tec_ctr fix val 8</td>
</tr>
<tr>
<td>p2209[0...n]</td>
<td>CO: Technology controller, fixed value 9 / Tec_ctr fix val 9</td>
</tr>
<tr>
<td>p2210[0...n]</td>
<td>CO: Technology controller, fixed value 10 / Tec_ctr fix val 10</td>
</tr>
<tr>
<td>p2211[0...n]</td>
<td>CO: Technology controller, fixed value 11 / Tec_ctr fix val 11</td>
</tr>
<tr>
<td>p2212[0...n]</td>
<td>CO: Technology controller, fixed value 12 / Tec_ctr fix val 12</td>
</tr>
<tr>
<td>p2213[0...n]</td>
<td>CO: Technology controller, fixed value 13 / Tec_ctr fix val 13</td>
</tr>
<tr>
<td>p2214[0...n]</td>
<td>CO: Technology controller, fixed value 14 / Tec_ctr fix val 14</td>
</tr>
<tr>
<td>p2215[0...n]</td>
<td>CO: Technology controller, fixed value 15 / Tec_ctr fix val 15</td>
</tr>
<tr>
<td>p2216[0...n]</td>
<td>Technology controller fixed value selection method / Tec_ctr FixVal sel</td>
</tr>
<tr>
<td>p2230[0...n]</td>
<td>Technology controller motorized potentiometer configuration / Tec_ctr mop config</td>
</tr>
<tr>
<td>p2237[0...n]</td>
<td>Technology controller motorized potentiometer maximum value / Tec_ctr mop max</td>
</tr>
<tr>
<td>p2238[0...n]</td>
<td>Technology controller motorized potentiometer minimum value / Tec_ctr mop min</td>
</tr>
<tr>
<td>p2240[0...n]</td>
<td>Technology controller motorized potentiometer starting value / Tec_ctr mop start</td>
</tr>
<tr>
<td>p2247[0...n]</td>
<td>Technology controller motorized potentiometer ramp-up time / Tec_ctr mop t_r-up</td>
</tr>
<tr>
<td>p2248[0...n]</td>
<td>Technology controller motorized potentiometer ramp-down time / Tec_ctrMop t_rdown</td>
</tr>
<tr>
<td>p2502[0...n]</td>
<td>LR encoder assignment / Encoder assignment</td>
</tr>
<tr>
<td>p2503[0...n]</td>
<td>LR length unit LU per 10 mm / LU per 10 mm</td>
</tr>
<tr>
<td>p2504[0...n]</td>
<td>LR motor/load motor revolutions / Mot/load motor rev</td>
</tr>
<tr>
<td>p2505[0...n]</td>
<td>LR motor/load motor revolutions / Mot/load motor rev</td>
</tr>
</tbody>
</table>
1.3.3 Parameters for encoder data sets (EDS)

Note:

Chapter "Data sets"

The following list contains the parameters that are dependent on the encoder data sets.

Product: S110, Version: 4402100, Language: eng, Type: EDS

- Encoder interface (Sensor Module) component number / Enc_interf comp_no
- Encoder component number / Encoder comp_no
- Sensor Module detection via LED / SM detection LED
- Activate/de-activate encoder interface / Enc_intf act/deact
- Encoder interface active/inactive / Enc_intf act/inact
- Sensor Module EEPROM data version / SM EEPROM version
- Sensor Module firmware version / SM FW version
- Encoder type selection / Enc_typ sel
- Encoder type, OEM selection / Enc_type OEM sel
- Encoder configuration effective / Enc_config eff
- Square-wave encoder track A/B / Sq-wave enc A/B
- Rotary encoder pulse No. / Rot enc pulse No.
- Encoder inversion actual value / Enc inv act value
- Redundant coarse position value relevant bits (identified) / Relevant bits
- Gx_XIST1 Coarse position safe most significant bit (identified) / Gx_XIST1 safe MSB
- Fine resolution Gx_XIST1 (in bits) / Enc fine Gx_XIST1
Parameter

Parameters for data sets

- **p0419[0...n]** Fine resolution absolute value Gx_XIST2 (in bits) / Enc fine Gx_XIST2
- **p0421[0...n]** Absolute encoder rotary multiturn resolution / Enc abs multiturn
- **p0423[0...n]** Absolute encoder rotary singleturn resolution / Enc abs singleturn
- **p0425[0...n]** Encoder, rotary zero mark distance / Enc rot dist ZM
- **p0426[0...n]** Encoder SSI baud rate / Enc SSI baud rate
- **p0428[0...n]** Encoder SSI monoflop time / Enc SSI t_monoflop
- **p0429[0...n]** Encoder SSI configuration / Enc SSI config
- **p0430[0...n]** Sensor Module configuration / SM config
- **p0431[0...n]** Angular commutation offset / Ang_com offset
- **p0432[0...n]** Gearbox factor, encoder revolutions / Grbx_fact enc_rev
- **p0433[0...n]** Gearbox factor, motor/load revolutions / Grbx_fact mot_rev
- **p0434[0...n]** Encoder SSI error bit / Enc SSI error bit
- **p0435[0...n]** Encoder SSI alarm bit / Enc SSI alarm bit
- **p0436[0...n]** Encoder SSI parity bit / Enc SSI parity bit
- **p0437[0...n]** Sensor Module configuration extended / SM config ext
- **p0438[0...n]** Squarewave encoder filter time / Enc t_filt
- **p0439[0...n]** Encoder ramp-up time / Enc ramp-up time
- **p0440[0...n]** Copy encoder serial number / Copy enc ser_no
- **p0441[0...n]** Encoder commissioning serial number part 1 / Enc comm ser_no 1
- **p0442[0...n]** Encoder commissioning serial number part 2 / Enc comm ser_no 2
- **p0443[0...n]** Encoder commissioning serial number part 3 / Enc comm ser_no 3
- **p0444[0...n]** Encoder commissioning serial number part 4 / Enc comm ser_no 4
- **p0445[0...n]** Encoder commissioning serial number part 5 / Enc comm ser_no 5
- **p0446[0...n]** Encoder SSI number of bits before the absolute value / Enc SSI bit before
- **p0447[0...n]** Encoder SSI number of bits absolute value / Enc SSI bit val
- **p0448[0...n]** Encoder SSI number of bits after the absolute value / Enc SSI bit after
- **p0449[0...n]** Encoder SSI number of bits, filler bits / Enc SSI fill bits
- **p0453[0...n]** Pulse encoder evaluation zero speed measuring time / Enc_ev z 0 t_meas
- **p0493[0...n]** Zero mark selection, input terminal / ZM_sel inp_term
- **p0494[0...n]** Equivalent zero mark, input terminal / ZM_equiv input
- **p2507[0...n]** LR absolute encoder adjustment status / Abs_enc_adj stat
- **p2525[0...n]** CO: LR encoder adjustment, offset / Enc_adj offset
- **p4662[0...n]** Encoder characteristic type / Enc char_type
- **p4663[0...n]** Encoder characteristic K0 / Enc char K0
- **p4664[0...n]** Encoder characteristic K1 / Enc char K1
- **p4665[0...n]** Encoder characteristic K2 / Enc char K2
- **p4666[0...n]** Encoder characteristic K3 / Enc char K3
- **p4670[0...n]** Analog sensor configuration / Ana_sens config
- **p4671[0...n]** Analog sensor input / Ana_sens inp
- **p4672[0...n]** Analog sensor channel A voltage at actual value zero / Ana_sens A U at 0
- **p4673[0...n]** Analog sensor channel A voltage per encoder period / Ana_sens A U/per
- **p4674[0...n]** Analog sensor channel B voltage at actual value zero / Ana_sens B U at 0
- **p4675[0...n]** Analog sensor channel B voltage per encoder period / Ana_sens B U/per
- **p4676[0...n]** Analog sensor range limit threshold / Ana_sens lim thr
- **p4677[0...n]** Analog sensor LVDT configuration / Ana_sens LVDT conf
- **p4678[0...n]** Analog sensor LVDT ratio / An_sens LVDT ratio
- **p4679[0...n]** Analog sensor LVDT phase / An_sens LVDT ph
- **p4680[0...n]** Zero mark monitoring tolerance permissible / ZM_monit tol perm
- **p4681[0...n]** Zero mark monitoring, tolerance window limit 1 positive / ZM tol lim 1 pos
- **p4682[0...n]** Zero mark monitoring, tolerance window limit 1 negative / ZM tol lim 1 neg
- **p4683[0...n]** Zero mark monitoring tolerance window alarm threshold positive / ZM tol A_thr pos
- **p4684[0...n]** Zero mark monitoring tolerance window alarm threshold negative / ZM tol A_thr neg
### Parameters for data sets

**Parameter**

1. **p4685[0...n]** Speed actual value mean value generation / n_act mean val

2. **p4686[0...n]** Zero mark minimum length / ZM min length

### 1.3.4 Parameters for motor data sets (MDS)

**Note:**

Chapter "Data sets"

The following list contains the parameters that are dependent on the motor data sets.

Product: S110, Version: 4402100, Language: eng, Type: MDS

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>p0131[0...n]</td>
<td>Motor component number / Mot comp_no</td>
</tr>
<tr>
<td>p0300[0...n]</td>
<td>Motor type selection / Mot type sel</td>
</tr>
<tr>
<td>p0301[0...n]</td>
<td>Motor code number selection / Mot code No. sel</td>
</tr>
<tr>
<td>r0302[0...n]</td>
<td>Motor code number of motor with DRIVE-CLiQ / Motor code Mot DLQ</td>
</tr>
<tr>
<td>r0303[0...n]</td>
<td>Motor with DRIVE-CLiQ status word / Motor w DLQ ZSW</td>
</tr>
<tr>
<td>p0304[0...n]</td>
<td>Rated motor voltage / Mot U_rated</td>
</tr>
<tr>
<td>p0305[0...n]</td>
<td>Rated motor current / Mot I_rated</td>
</tr>
<tr>
<td>p0307[0...n]</td>
<td>Rated motor power / Mot P_rated</td>
</tr>
<tr>
<td>p0308[0...n]</td>
<td>Rated motor power factor / Mot cos_phi_rated</td>
</tr>
<tr>
<td>p0310[0...n]</td>
<td>Rated motor frequency / Mot f_rated</td>
</tr>
<tr>
<td>p0311[0...n]</td>
<td>Rated motor speed / Mot n_rated</td>
</tr>
<tr>
<td>p0312[0...n]</td>
<td>Rated motor torque / Mot M_rated</td>
</tr>
<tr>
<td>r0313[0...n]</td>
<td>Motor pole pair number, actual (or calculated) / Mot PolePairNo act</td>
</tr>
<tr>
<td>p0314[0...n]</td>
<td>Motor pole pair number / Mot pole pair No.</td>
</tr>
<tr>
<td>p0315[0...n]</td>
<td>Motor pole position identification current, 1st phase / Mot PolID I 1st ph</td>
</tr>
<tr>
<td>p0316[0...n]</td>
<td>Motor torque constant / Mot kT</td>
</tr>
<tr>
<td>p0317[0...n]</td>
<td>Motor stall current / Mot I_standstill</td>
</tr>
<tr>
<td>p0318[0...n]</td>
<td>Motor stall torque / Mot M_standstill</td>
</tr>
<tr>
<td>p0320[0...n]</td>
<td>Motor rated magnetizing current/short-circuit current / Mot I_mag_rated</td>
</tr>
<tr>
<td>p0322[0...n]</td>
<td>Maximum motor speed / Mot n_max</td>
</tr>
<tr>
<td>p0323[0...n]</td>
<td>Maximum motor current / Mot I_max</td>
</tr>
<tr>
<td>p0324[0...n]</td>
<td>Winding maximum speed / Winding n_max</td>
</tr>
<tr>
<td>p0325[0...n]</td>
<td>Motor pole position identification current, 1st phase / Mot PolID I 1st ph</td>
</tr>
<tr>
<td>p0328[0...n]</td>
<td>Motor stall torque correction factor / Mot M_stall_corr</td>
</tr>
<tr>
<td>p0329[0...n]</td>
<td>Optimum motor load angle / Mot phi_load opt</td>
</tr>
<tr>
<td>p0330[0...n]</td>
<td>Motor reluctance torque constant / Mot kT_reluctance</td>
</tr>
<tr>
<td>r0331[0...n]</td>
<td>Motor pole position identification current / Mot PolID current</td>
</tr>
<tr>
<td>r0332[0...n]</td>
<td>Rated motor slip / Mot slip_rated</td>
</tr>
<tr>
<td>r0333[0...n]</td>
<td>Actual motor magnetizing current/short-circuit current / Mot I_mag_rtd act</td>
</tr>
<tr>
<td>r0334[0...n]</td>
<td>Rated motor power factor / Mot cos_phi_rated</td>
</tr>
<tr>
<td>r0335[0...n]</td>
<td>Rated motor torque / Mot M_rated</td>
</tr>
<tr>
<td>r0336[0...n]</td>
<td>Actual motor-torque constant / Mot kT act</td>
</tr>
<tr>
<td>r0337[0...n]</td>
<td>Motor cooling type / Motor cooling type</td>
</tr>
<tr>
<td>r0338[0...n]</td>
<td>Rated motor EMF / Mot EMF_rated</td>
</tr>
<tr>
<td>r0339[0...n]</td>
<td>Motor limit current / Mot I_limit</td>
</tr>
<tr>
<td>r0340[0...n]</td>
<td>Rated motor voltage / Mot U_rated</td>
</tr>
<tr>
<td>r0341[0...n]</td>
<td>Motor moment of inertia / Mot M_mom of inert</td>
</tr>
<tr>
<td>r0342[0...n]</td>
<td>Ratio between the total and motor moment of inertia / Mot MomInert Ratio</td>
</tr>
<tr>
<td>Parameter</td>
<td>Description</td>
</tr>
<tr>
<td>-----------</td>
<td>-------------</td>
</tr>
<tr>
<td>p034[0...n]</td>
<td>Motor weight (for the thermal motor model) / Mot weight th mod</td>
</tr>
<tr>
<td>p0347[0...n]</td>
<td>Motor de-excitation time / Mot t_de-excitat.</td>
</tr>
<tr>
<td>p0348[0...n]</td>
<td>Speed at the start of field weakening Vdc = 600 V / Mot n_field weaken</td>
</tr>
<tr>
<td>p0350[0...n]</td>
<td>Motor stator resistance, cold / Mot R_stator cold</td>
</tr>
<tr>
<td>p0352[0...n]</td>
<td>Cable resistance / Mot R_cable cold</td>
</tr>
<tr>
<td>p0353[0...n]</td>
<td>Motor series inductance / Mot L_series</td>
</tr>
<tr>
<td>p0354[0...n]</td>
<td>Motor rotor resistance cold / damping resistance d axis / Mot R_r cold/R_D d</td>
</tr>
<tr>
<td>p0356[0...n]</td>
<td>Motor stator leakage inductance / Mot L_stator leak.</td>
</tr>
<tr>
<td>p0358[0...n]</td>
<td>Motor rotor leakage inductance / damping inductance, d axis / Mot L_r leak / LDd</td>
</tr>
<tr>
<td>p0360[0...n]</td>
<td>Motor magnetizing inductance/magn. inductance, d axis saturated / Mot Lh/Lh d sat</td>
</tr>
<tr>
<td>r0370[0...n]</td>
<td>Motor stator resistance, cold / Mot R_stator cold</td>
</tr>
<tr>
<td>r0373[0...n]</td>
<td>Motor rated stator resistance / Mot R_stator rated</td>
</tr>
<tr>
<td>r0374[0...n]</td>
<td>Motor rotor resistance cold / damping resistance d axis / Mot R_r cold / RDd</td>
</tr>
<tr>
<td>r0376[0...n]</td>
<td>Rated motor rotor resistance / Mot R_rotor rated</td>
</tr>
<tr>
<td>r0377[0...n]</td>
<td>Motor leakage inductance, total / Mot L_leak total</td>
</tr>
<tr>
<td>r0382[0...n]</td>
<td>Motor magnetizing inductance transformed / Lh d axis saturated / Mot L_m tr/Lhd sat</td>
</tr>
<tr>
<td>r0384[0...n]</td>
<td>Motor rotor time constant / damping time constant d axis / Mot T_rotor/T_Dd</td>
</tr>
<tr>
<td>r0386[0...n]</td>
<td>Motor stator leakage time constant / Mot T_stator leak</td>
</tr>
<tr>
<td>p0391[0...n]</td>
<td>Current controller adaptation, starting point KP / I_adapt pt KP</td>
</tr>
<tr>
<td>p0392[0...n]</td>
<td>Current controller adaptation, starting point KP adapted / I_adapt pt KP adap</td>
</tr>
<tr>
<td>p0393[0...n]</td>
<td>Current controller adaptation p gain adaptation / I_adapt Kp adap</td>
</tr>
<tr>
<td>r0395[0...n]</td>
<td>Actual stator resistance / R_stator act</td>
</tr>
<tr>
<td>r0396[0...n]</td>
<td>Actual rotor resistance / RRotor act</td>
</tr>
<tr>
<td>p0530[0...n]</td>
<td>Bearing type selection / Bearing type sel</td>
</tr>
<tr>
<td>p0531[0...n]</td>
<td>Bearing code number selection / Bear. code num sel</td>
</tr>
<tr>
<td>p0532[0...n]</td>
<td>Bearing maximum speed / Bearing n_max</td>
</tr>
<tr>
<td>p0600[0...n]</td>
<td>Motor temperature sensor for monitoring / Mot temp_sense</td>
</tr>
<tr>
<td>p0601[0...n]</td>
<td>Motor temperature sensor type / Mot_temp_sens type</td>
</tr>
<tr>
<td>p0604[0...n]</td>
<td>Motor temperature alarm threshold / Mot_temp al thr</td>
</tr>
<tr>
<td>p0605[0...n]</td>
<td>Motor temperature fault threshold / Mot_temp flt thr</td>
</tr>
<tr>
<td>p0606[0...n]</td>
<td>Motor temperature timer / Mot_temp timer</td>
</tr>
<tr>
<td>p0607[0...n]</td>
<td>Temperature sensor fault timer / Sensor fault time</td>
</tr>
<tr>
<td>p0611[0...n]</td>
<td>I2t motor model thermal time constant / I2t mot_mod T</td>
</tr>
<tr>
<td>p0612[0...n]</td>
<td>Thermal motor model configuration / Therm Mot_mod conf</td>
</tr>
<tr>
<td>p0615[0...n]</td>
<td>I2t motor model fault threshold / I2t mot_mod thresh</td>
</tr>
<tr>
<td>p0616[0...n]</td>
<td>Motor overtemperature alarm threshold 1 / / Mot temp alarm 1</td>
</tr>
<tr>
<td>p0620[0...n]</td>
<td>Thermal adaptation, stator and rotor resistance / Mot therm_adapt R</td>
</tr>
<tr>
<td>p0624[0...n]</td>
<td>Motor Temperature Offset PT100 / Mot T_offset PT100</td>
</tr>
<tr>
<td>p0625[0...n]</td>
<td>Motor ambient temperature / Mot T_ambient</td>
</tr>
<tr>
<td>p0628[0...n]</td>
<td>Motor overtemperature, stator core / Mot T_over core</td>
</tr>
<tr>
<td>p0627[0...n]</td>
<td>Motor overtemperature, stator winding / Mot T_over stator</td>
</tr>
<tr>
<td>p0628[0...n]</td>
<td>Motor overtemperature rotor winding / Mot T_over rotor</td>
</tr>
<tr>
<td>r0630[0...n]</td>
<td>Motor temperature model ambient temperature / MotTMod T_amb.</td>
</tr>
<tr>
<td>r0631[0...n]</td>
<td>Motor temperature model, stator core temperature / MotTMod T_core</td>
</tr>
<tr>
<td>r0632[0...n]</td>
<td>Motor temperature model, stator winding temperature / MotTMod T_copper</td>
</tr>
<tr>
<td>r0633[0...n]</td>
<td>Motor temperature model, rotor temperature / MotTMod T_rotor</td>
</tr>
<tr>
<td>p0643[0...n]</td>
<td>Overvoltage protection for synchronous motors / Overvolt_protect</td>
</tr>
<tr>
<td>p0650[0...n]</td>
<td>Actual motor operating hours / Mot t_oper act</td>
</tr>
<tr>
<td>p0651[0...n]</td>
<td>Motor operating hours maintenance interval / Mot t_op maint</td>
</tr>
<tr>
<td>p0826[0...n]</td>
<td>Motor changeover, motor number / Mot_chng mot No.</td>
</tr>
<tr>
<td>p0827[0...n]</td>
<td>Motor changeover status word bit number / Mot_chg ZSW bitNo.</td>
</tr>
<tr>
<td>p1231[0...n]</td>
<td>Armature short-circuit / DC braking configuration / ASC/DCBRK config</td>
</tr>
<tr>
<td>p1232[0...n]</td>
<td>DC braking, braking current / DCBRK I_brake</td>
</tr>
</tbody>
</table>
1.3.5 Parameters for power unit data sets (PDS)

Note:

References: /FH3/ SINAMICS S110 Function Manual Chapter "Data Sets"

The following list contains the parameters that are dependent on the power unit data sets.

Product: S110, Version: 4402100, Language: eng, Type: PDS

p0121[0...n] Power unit component number / PU comp_no
r0127[0...n] Power unit version EPROM data / PU EPROM version
r0128[0...n] Power unit, firmware version / PU FW version
r0200[0...n] Actual power unit type / PU actual type
p0203[0...n] Power unit hardware properties / PU HW property
p0251[0...n] Operating hours counter power unit fan / PU fan t_oper

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SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3 1-743
Parameters for data sets
Contents

2.1 Table of contents 2-746
2.2 Explanations on the function diagrams 2-753
2.3 Overviews 2-758
2.4 CU305 input/output terminals 2-768
2.5 PROFIdrive 2-776
2.6 Internal control/status words 2-813
2.7 Sequence control 2-826
2.8 Brake control 2-829
2.9 Safety Integrated 2-834
2.10 Setpoint channel 2-853
2.11 Setpoint channel not activated 2-862
2.12 Basic positioner (EPOS) 2-864
2.13 Position control 2-880
2.14 Encoder evaluation 2-885
2.15 Servo control 2-892
2.16 Technology functions 2-912
2.17 Free function blocks (FBLOCKS) 2-915
2.18 Technology controller 2-933
2.19 Signals and monitoring functions 2-938
2.20 Diagnostics 2-944
2.21 Data sets 2-950
2.22 CANopen interface 2-955
2.23 Basic Operator Panel 20 (BOP20) 2-962
## 2.1 Table of contents

### 2.2 Explanations on the function diagrams
- 1020 – Explanation of the symbols (Part 1) ........................................ 2-754
- 1021 – Explanation of the symbols (Part 2) ........................................ 2-755
- 1022 – Explanation of the symbols (Part 3) ........................................ 2-756
- 1030 – Handling BICO technology .................................................... 2-757

### 2.3 Overviews
- 1510 – CU305 input/output terminals ................................................ 2-759
- 1520 – PROFIdrive .......................................................................... 2-760
- 1530 – Internal control/status words, data sets .................................. 2-761
- 1550 – Setpoint channel .................................................................. 2-762
- 1580 – Servo control, encoder evaluations (position, speed, temperature) .......................................................... 2-763
- 1590 – Servo control, speed control and U/f control ......................... 2-764
- 1610 – Servo control, generation of the torque limits ....................... 2-765
- 1630 – Servo control, current control ................................................ 2-766
- 1750 – Monitoring functions, faults, alarms ....................................... 2-767

### 2.4 CU305 input/output terminals .................................................... 2-768
- 2020 – Digital inputs, electrically isolated (DI 0 to DI 3) ..................... 2-769
- 2021 – Digital inputs, electrically isolated (DI 16 to DI 19) ................. 2-770
- 2022 – Digital inputs, electrically isolated (DI 20 to DI 22) ................. 2-771
- 2030 – Digital inputs/outputs, bidirectional (DI/DO 8 to DI/DO 9) ....... 2-772
- 2031 – Digital inputs/outputs, bidirectional (DI/DO 10 to DI/DO 11) ...... 2-773
- 2038 – Digital output (DO 16) ......................................................... 2-774
- 2040 – Analog input (AI) .................................................................. 2-775

### 2.5 PROFIdrive .............................................................................. 2-776
- 2410 – PROFIBUS (PB), addresses and diagnostics ......................... 2-778
- 2420 – Standard telegrams and process data ...................................... 2-779
- 2422 – Manufacturer-specific telegrams and process data .................. 2-780
- 2424 – Manufacturer-specific/free telegrams and process data .......... 2-781
- 2439 – PZD receive signals, interconnection profile-specific ................ 2-782
- 2440 – PZD receive signals, interconnection, manufacturer-specific ...... 2-783
- 2442 – STW1 control word interconnection (p2038 = 0) .................... 2-784
- 2443 – STW1 control word interconnection (p2038 = 1) .................... 2-785
<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>2444</td>
<td>STW2 control word interconnection (p2038 = 0)</td>
<td>2-786</td>
</tr>
<tr>
<td>2445</td>
<td>STW2 control word interconnection (p2038 = 1)</td>
<td>2-787</td>
</tr>
<tr>
<td>2449</td>
<td>PZD send signals, interconnection, profile-specific</td>
<td>2-788</td>
</tr>
<tr>
<td>2450</td>
<td>PZD send signals, interconnection, manufacturer-specific</td>
<td>2-789</td>
</tr>
<tr>
<td>2452</td>
<td>ZSW1 status word interconnection (p2038 = 0)</td>
<td>2-790</td>
</tr>
<tr>
<td>2453</td>
<td>ZSW1 status word interconnection (p2038 = 1)</td>
<td>2-791</td>
</tr>
<tr>
<td>2454</td>
<td>ZSW2 status word interconnection (p2038 = 0)</td>
<td>2-792</td>
</tr>
<tr>
<td>2455</td>
<td>ZSW2 status word interconnection (p2038 = 1)</td>
<td>2-793</td>
</tr>
<tr>
<td>2456</td>
<td>MELDW status word interconnection</td>
<td>2-794</td>
</tr>
<tr>
<td>2462</td>
<td>PosSTW-Pos control word interconnection (r0108.4 = 1)</td>
<td>2-795</td>
</tr>
<tr>
<td>2463</td>
<td>POS_STW1 positioning control word 1 interconnection (r0108.4 = 1)</td>
<td>2-796</td>
</tr>
<tr>
<td>2464</td>
<td>POS_STW2 positioning control word 2 interconnection (r0108.4 = 1)</td>
<td>2-797</td>
</tr>
<tr>
<td>2466</td>
<td>POS_ZSW1 positioning status word 1 interconnection (r0108.4 = 1)</td>
<td>2-798</td>
</tr>
<tr>
<td>2467</td>
<td>POS_ZSW2 positioning status word 2 interconnection (r0108.4 = 1)</td>
<td>2-799</td>
</tr>
<tr>
<td>2468</td>
<td>IF1 receive telegram, free interconnection via BICO (p0922 = 999)</td>
<td>2-800</td>
</tr>
<tr>
<td>2470</td>
<td>IF1 send telegram, free interconnection via BICO (p0922 = 999)</td>
<td>2-801</td>
</tr>
<tr>
<td>2472</td>
<td>IF1 status words, free interconnection</td>
<td>2-802</td>
</tr>
<tr>
<td>2475</td>
<td>STW1 control word 1 interconnection (r0108.4 = 1)</td>
<td>2-803</td>
</tr>
<tr>
<td>2476</td>
<td>SATZANW-Pos block selection interconnection (r0108.4 = 1)</td>
<td>2-804</td>
</tr>
<tr>
<td>2479</td>
<td>ZSW1 status word 1 interconnection (r0108.4 = 1)</td>
<td>2-805</td>
</tr>
<tr>
<td>2480</td>
<td>MDIMode interconnection (r0108.4 = 1)</td>
<td>2-806</td>
</tr>
<tr>
<td>2481</td>
<td>IF1 receive telegram, free interconnection via BICO (p0922 = 999)</td>
<td>2-807</td>
</tr>
<tr>
<td>2483</td>
<td>IF1 send telegram, free interconnection via BICO (p0922 = 999)</td>
<td>2-808</td>
</tr>
<tr>
<td>2495</td>
<td>CU_STW control word, Control Unit interconnection</td>
<td>2-809</td>
</tr>
<tr>
<td>2496</td>
<td>CU_ZSW status word, Control Unit interconnection</td>
<td>2-810</td>
</tr>
<tr>
<td>2497</td>
<td>A_DIGITAL interconnection</td>
<td>2-811</td>
</tr>
<tr>
<td>2498</td>
<td>E_DIGITAL interconnection</td>
<td>2-812</td>
</tr>
</tbody>
</table>

### 2.6 Internal control/status words

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>2501</td>
<td>Control word, sequence control</td>
<td>2-813</td>
</tr>
<tr>
<td>2503</td>
<td>Status word, sequence control</td>
<td>2-814</td>
</tr>
<tr>
<td>2505</td>
<td>Control word, setpoint channel</td>
<td>2-815</td>
</tr>
<tr>
<td>2520</td>
<td>Control word, speed controller</td>
<td>2-816</td>
</tr>
<tr>
<td>2522</td>
<td>Status word, speed controller</td>
<td>2-817</td>
</tr>
<tr>
<td>2526</td>
<td>Status word, closed-loop control</td>
<td>2-818</td>
</tr>
<tr>
<td>2530</td>
<td>Status word, current control</td>
<td>2-819</td>
</tr>
</tbody>
</table>

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SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3
### Function diagrams

#### Table of contents

<table>
<thead>
<tr>
<th>Page</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2534</td>
<td>Status word, monitoring functions 1</td>
</tr>
<tr>
<td>2536</td>
<td>Status word, monitoring functions 2</td>
</tr>
<tr>
<td>2537</td>
<td>Status word, monitoring functions 3</td>
</tr>
<tr>
<td>2546</td>
<td>Control word, faults/alarms</td>
</tr>
<tr>
<td>2548</td>
<td>Status word, faults/alarms 1 and 2</td>
</tr>
<tr>
<td>2.7</td>
<td><strong>Sequence control</strong></td>
</tr>
<tr>
<td>2610</td>
<td>Sequencer</td>
</tr>
<tr>
<td>2634</td>
<td>Missing enable signals, line contactor control</td>
</tr>
<tr>
<td>2.8</td>
<td><strong>Brake control</strong></td>
</tr>
<tr>
<td>2701</td>
<td>Basic brake control (r0108.14 = 0)</td>
</tr>
<tr>
<td>2704</td>
<td>Extended brake control, zero-speed detection (r0108.14 = 1)</td>
</tr>
<tr>
<td>2707</td>
<td>Extended brake control, open/close brake (r0108.14 = 1)</td>
</tr>
<tr>
<td>2711</td>
<td>Extended brake control, signal outputs (r0108.14 = 1)</td>
</tr>
<tr>
<td>2.9</td>
<td><strong>Safety Integrated</strong></td>
</tr>
<tr>
<td>2800</td>
<td>Basic Functions, parameter manager</td>
</tr>
<tr>
<td>2802</td>
<td>Basic Functions, monitoring functions and faults/alarms</td>
</tr>
<tr>
<td>2804</td>
<td>Basic Functions, status words</td>
</tr>
<tr>
<td>2810</td>
<td>Basic Functions, STO (Safe Torque Off)/SS1 (Safe Stop 1)</td>
</tr>
<tr>
<td>2811</td>
<td>Basic Functions, STO (Safe Torque Off), safe pulse cancellation</td>
</tr>
<tr>
<td>2814</td>
<td>Basic Functions, SBC (Safe Brake Control)</td>
</tr>
<tr>
<td>2820</td>
<td>Extended Functions, SLS (Safely-Limited Speed)</td>
</tr>
<tr>
<td>2825</td>
<td>Extended Functions, SS1, SS2, SOS, internal STOP B, C, D, F</td>
</tr>
<tr>
<td>2840</td>
<td>Extended Functions, control word and status word</td>
</tr>
<tr>
<td>2846</td>
<td>Extended Functions, parameter manager</td>
</tr>
<tr>
<td>2850</td>
<td>Extended Functions (F-DI 0 ... F-DI 2)</td>
</tr>
<tr>
<td>2853</td>
<td>Extended Functions (F-DO 0)</td>
</tr>
<tr>
<td>2855</td>
<td>Extended Functions, control interface</td>
</tr>
<tr>
<td>2856</td>
<td>Extended Functions, Safe State selection</td>
</tr>
<tr>
<td>2857</td>
<td>Extended Functions, assignment (F-DO 0)</td>
</tr>
<tr>
<td>2858</td>
<td>Extended Functions, control via PROFI safe (p9601.2 = p9601.3 = 1)</td>
</tr>
<tr>
<td>2860</td>
<td>Extended Functions, SSM (Safe Speed Monitor)</td>
</tr>
<tr>
<td>2861</td>
<td>Extended Functions, SDI (Safe Direction)</td>
</tr>
</tbody>
</table>
2.10 Setpoint channel ................................. 2-853
3010 – Fixed speed setpoints ......................... 2-854
3020 – Motorized potentiometer ..................... 2-855
3030 – Main/supplementary setpoint, setpoint scaling, jogging ......................... 2-856
3040 – Direction limitation and direction reversal ......................... 2-857
3050 – Skip frequency bands and speed limitations ......................... 2-858
3060 – Basic ramp-function generator ................... 2-859
3070 – Extended ramp-function generator ................... 2-860
3080 – Ramp-function generator selection, status word, tracking ................... 2-861

2.11 Setpoint channel not activated ......................... 2-862
3095 – Generating the speed limits (r0108.8 = 0) ......................... 2-863

2.12 Basic positioner (EPOS) .......................... 2-864
3610 – Jog mode (r0108.4 = 1) ......................... 2-865
3612 – Referencing/reference point approach mode (r0108.4 = 1) (p2597 = 0 signal) ......................... 2-866
3614 – Flying referencing mode (r0108.4 = 1) (p2597 = 1 signal) ......................... 2-867
3615 – Traversing block mode, external block change (r0108.4 = 1) ......................... 2-868
3616 – Traversing block mode (r0108.4 = 1) ......................... 2-869
3617 – Travel to fixed stop (r0108.4 = 1) ......................... 2-870
3618 – Direct setpoint input/MDI mode, dynamic values (r0108.4 = 1) ......................... 2-871
3620 – Direct setpoint input/MDI mode (r0108.4 = 1) ......................... 2-872
3625 – Mode control (r0108.4 = 1) ......................... 2-873
3630 – Traversing range limits (r0108.4 = 1) ......................... 2-874
3635 – Interpolator (r0108.4 = 1) ......................... 2-875
3640 – Control word block selection/MDI selection (r0108.4 = 1) ......................... 2-876
3645 – Status word 1 (r0108.3 = 1, r0108.4 = 1) ......................... 2-877
3646 – Status word 2 (r0108.3 = 1, r0108.4 = 1) ......................... 2-878
3650 – Status word, active traversing block/MDI active (r0108.4 = 1) ......................... 2-879

2.13 Position control ................................. 2-880
4010 – Position actual value preprocessing (r0108.3 = 1) ......................... 2-881
4015 – Position controller (r0108.3 = 1) ......................... 2-882
4020 – Standstill/positioning monitoring (r0108.3 = 1) ......................... 2-883
4025 – Dynamic following error monitoring, cam controllers (r0108.3 = 1) ......................... 2-884
### Encoder evaluation

- 4704 – Position and temperature sensing, encoders 1 ... 2 .......................... 2-886
- 4710 – Speed actual value and pole position sensing, motor encoder (encoder 1) ........ 2-887
- 4720 – Encoder interface, receive signals, encoders 1 ... 2 .............................. 2-888
- 4730 – Encoder interface, send signals, encoders 1 ... 2 ................................. 2-889
- 4735 – Reference mark search with external zero mark, encoder 1 ..................... 2-890
- 4740 – Probe evaluation, measured value memory, encoders 1 ... 2 ................. 2-891

### Servo control

- 5020 – Speed setpoint filter and speed pre-control ........................................ 2-893
- 5030 – Reference model/pre-control balancing/speed limitation ........................ 2-894
- 5040 – Speed controller with encoder .......................................................... 2-895
- 5042 – Speed controller, torque/speed pre-control with encoder (p1402.4 = 1) ...... 2-896
- 5050 – Kp_n-/Tn_n adaptation ....................................................................... 2-897
- 5060 – Torque setpoint, control type changeover ............................................. 2-898
- 5100 – Speed controller without encoder ...................................................... 2-899
- 5300 – U/f control for diagnostics ................................................................. 2-900
- 5301 – Signaling function variable ............................................................... 2-901
- 5490 – Speed control configuration ............................................................... 2-902
- 5610 – Torque limiting/reduction/interpolator ............................................... 2-903
- 5620 – Motor/generating torque limit ............................................................. 2-904
- 5630 – Upper/lower torque limit ................................................................. 2-905
- 5640 – Mode changeover, power/current limiting ........................................ 2-906
- 5650 – Vdc_max controller and Vdc_min controller ..................................... 2-907
- 5710 – Current setpoint filter ..................................................................... 2-908
- 5714 – Id and Iq controller ......................................................................... 2-909
- 5720 – Field current/flux input, flux reduction, flux controller ..................... 2-910
- 5730 – Interface to the Motor Module (gating signals, current actual values) .... 2-911

### Technology functions

- 7014 – External Armature Short-Circuit (EASC, p0300 = 2xx or 4xx) ............. 2-913
- 7017 – DC brake (p0300 = 1xx) ................................................................. 2-914

### Free function blocks (FBLOCKS)

- 7200 – General information ................................................................. 2-915
- 7210 – AND (AND function block with 4 inputs) .................................... 2-916
- 7212 – OR (OR function block with 4 inputs) ........................................ 2-917
<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>7214</td>
<td>XOR (XOR function block with 4 inputs)</td>
<td>2-919</td>
</tr>
<tr>
<td>7216</td>
<td>NOT (inverter)</td>
<td>2-920</td>
</tr>
<tr>
<td>7220</td>
<td>ADD (adder with 4 inputs), SUB (subtractor)</td>
<td>2-921</td>
</tr>
<tr>
<td>7222</td>
<td>MUL (multiplier), DIV (divider)</td>
<td>2-922</td>
</tr>
<tr>
<td>7224</td>
<td>AVA (absolute value generator)</td>
<td>2-923</td>
</tr>
<tr>
<td>7230</td>
<td>MFP (pulse generator), PCL (pulse contractor)</td>
<td>2-924</td>
</tr>
<tr>
<td>7232</td>
<td>PDE (ON delay), PDF (OFF delay)</td>
<td>2-925</td>
</tr>
<tr>
<td>7234</td>
<td>PST (pulse stretcher)</td>
<td>2-926</td>
</tr>
<tr>
<td>7240</td>
<td>RSR (RS flip-flop), DFR (D flip-flop)</td>
<td>2-927</td>
</tr>
<tr>
<td>7250</td>
<td>BSW (binary switch), NSW (numeric switch)</td>
<td>2-928</td>
</tr>
<tr>
<td>7260</td>
<td>LI M (limiter)</td>
<td>2-929</td>
</tr>
<tr>
<td>7262</td>
<td>PT1 (smoothing element)</td>
<td>2-930</td>
</tr>
<tr>
<td>7264</td>
<td>INT (integrator), DIF (derivative-action element)</td>
<td>2-931</td>
</tr>
<tr>
<td>7270</td>
<td>LVM (double-sided limit monitor with hysteresis)</td>
<td>2-932</td>
</tr>
<tr>
<td>2.18</td>
<td>Technology controller</td>
<td>2-933</td>
</tr>
<tr>
<td>7950</td>
<td>Fixed values (r0108.16 = 1)</td>
<td>2-934</td>
</tr>
<tr>
<td>7951</td>
<td>Fixed values, direct selection (p2216 = 1)</td>
<td>2-935</td>
</tr>
<tr>
<td>7954</td>
<td>Motorized potentiometer (r0108.16 = 1)</td>
<td>2-936</td>
</tr>
<tr>
<td>7958</td>
<td>Closed-loop control (r0108.16 = 1)</td>
<td>2-937</td>
</tr>
<tr>
<td>2.19</td>
<td>Signals and monitoring functions</td>
<td>2-938</td>
</tr>
<tr>
<td>8010</td>
<td>Speed signals 1</td>
<td>2-939</td>
</tr>
<tr>
<td>8011</td>
<td>Speed signals 2</td>
<td>2-940</td>
</tr>
<tr>
<td>8012</td>
<td>Torque signals, motor locked/stalled</td>
<td>2-941</td>
</tr>
<tr>
<td>8014</td>
<td>Thermal monitoring, power unit</td>
<td>2-942</td>
</tr>
<tr>
<td>8016</td>
<td>Thermal monitoring, motor</td>
<td>2-943</td>
</tr>
<tr>
<td>2.20</td>
<td>Diagnostics</td>
<td>2-944</td>
</tr>
<tr>
<td>8060</td>
<td>Fault buffer</td>
<td>2-945</td>
</tr>
<tr>
<td>8065</td>
<td>Alarm buffer</td>
<td>2-946</td>
</tr>
<tr>
<td>8070</td>
<td>Fault/alarm trigger word (r2129)</td>
<td>2-947</td>
</tr>
<tr>
<td>8075</td>
<td>Fault/alarm configuration</td>
<td>2-948</td>
</tr>
<tr>
<td>8134</td>
<td>Measuring sockets</td>
<td>2-949</td>
</tr>
<tr>
<td>2.21</td>
<td>Data sets</td>
<td>2-950</td>
</tr>
<tr>
<td>8560</td>
<td>Command Data Sets (CDS)</td>
<td>2-951</td>
</tr>
</tbody>
</table>
### Function diagrams

#### Table of contents

<table>
<thead>
<tr>
<th>DDS: Drive Data Sets</th>
<th>EDS: Encoder Data Sets</th>
<th>MDS: Motor Data Sets</th>
</tr>
</thead>
<tbody>
<tr>
<td>8565</td>
<td>8570</td>
<td>8575</td>
</tr>
</tbody>
</table>

#### 2.22 CANopen interface

<table>
<thead>
<tr>
<th>DDS/EDS/MDS</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>8570</td>
<td>2-953</td>
</tr>
<tr>
<td>8575</td>
<td>2-954</td>
</tr>
<tr>
<td><strong>2.22</strong> CANopen interface</td>
<td>2-955</td>
</tr>
<tr>
<td>9204</td>
<td>2-956</td>
</tr>
<tr>
<td>9206</td>
<td>2-957</td>
</tr>
<tr>
<td>9208</td>
<td>2-958</td>
</tr>
<tr>
<td>9210</td>
<td>2-959</td>
</tr>
<tr>
<td>9220</td>
<td>2-960</td>
</tr>
<tr>
<td>9226</td>
<td>2-961</td>
</tr>
</tbody>
</table>

#### 2.23 Basic Operator Panel 20 (BOP20)

<table>
<thead>
<tr>
<th>DDS/EDS/MDS</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>9912</td>
<td>2-962</td>
</tr>
</tbody>
</table>

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## 2.2 Explanations on the function diagrams

### Function diagrams

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1020 – Explanation of the symbols (Part 1)</td>
<td>2-754</td>
</tr>
<tr>
<td>1021 – Explanation of the symbols (Part 2)</td>
<td>2-755</td>
</tr>
<tr>
<td>1022 – Explanation of the symbols (Part 3)</td>
<td>2-756</td>
</tr>
<tr>
<td>1030 – Handling BICO technology</td>
<td>2-757</td>
</tr>
</tbody>
</table>
Explanations on the function diagrams

Function diagrams

Fig. 2-2 1021 – Explanation of the symbols (Part 2)

Symbols for logic functions

- Logical inversion
- AND element with logical inversion of an input signal
- R/S flip-flop
  - S = setting input
  - R = reset input
  - Q = non-inverted output
  - Q̅ = inverted output
- Exclusiv-OR/XOR
  - y = 1 for x₁ ≠ x₂

Symbols for computational and closed-loop control functions

- Threshold value switch 1/0
  - Outputs at y a logical "1" if x < S.
- Threshold value switch 0/1
  - Outputs at y a logical "1" if x > S.
- Threshold value 1/0 with hysteresis
  - Outputs a logical "1" at y if x < S.
  - If x ≥ S + H then y returns to 0.
- Threshold value 0/1 with hysteresis
  - Outputs a logical "1" at y if x > S.
  - If x ≤ S - H then y returns to 0.
- Limiters
  - x is limited to the upper limit LU and the lower limit LL and output at y.
  - The digital signals MLU and MLL have the value "1", if the upper or lower limit is active.
- Sample & Hold element
  - Sample and hold element.
  - y = x if SET = 1
  - (not retentively saved at POWER OFF)

Symbols for computational and closed-loop control functions

- Fixed percentage values
- Fixed speed values
- Fixed torque values
- Pre-assigned binectors and connectors
- Switch symbol
- Symbols for logic functions
- Symbols for computational and closed-loop control functions
- Symbols for monitoring

Simple changeover switch

The switch position is shown according to the factory setting (in this case, switch position 1 in the default state on delivery).

Switch symbol

The switch position is shown according to the factory setting (in this case, switch position 1 in the default state on delivery).

Pre-assigned binectors and connectors

Fixed percentage values

-10 000.00...10 000.00 [%]

Pre-assigned binectors and connectors

Fixed speed values

-210 000.00...210 000.00 [1/min]

Pre-assigned binectors and connectors

Fixed torque values

-100 000.00...100 000.00 [Nm]

Symbols for logic functions

- Logical inversion
- AND element with logical inversion of an input signal
- R/S flip-flop
  - S = setting input
  - R = reset input
  - Q = non-inverted output
  - Q̅ = inverted output
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  - The digital signals MLU and MLL have the value "1", if the upper or lower limit is active.
- Sample & Hold element
  - Sample and hold element.
  - y = x if SET = 1
  - (not retentively saved at POWER OFF)

Symbols for monitoring

- Monitoring
  - In the bottom right-hand corner of the diagram.

DO: All objects

Explanations for the function diagrams - Explanation of the symbols (Part 2)
Explanations for the function diagrams - Explanation of the symbols (Part 3)

1. Switch-on delay
   - The digital signal x must have the value “1” without any interruption during the time T before output y changes to “1”.

2. Switch-off delay
   - The digital signal x must have the value “0” without interruption during the time T before output y changes to “0”.

3. Delay (switch-on and switch-off)
   - The digital signal x must have the value “1” without interruption during time T1, or must have the value “0” during time T2 before output y changes its signal state.

4. PT1 element
   - Delay element, first order.
   - pxxxx = time constant

5. PT2 low pass
   - Natural frequency, denominator fn_n
   - Damping, denominator D_n
   - Transfer function
   
   \[ H(s) = \frac{1}{s + \frac{2 \cdot \pi \cdot f_n}{2 n \cdot \pi} + \frac{2 \cdot D_n}{2 n \cdot \pi}} \]

6. 2nd-order filter (bandstop/general filter)
   - Natural frequency, numerator fn_z
   - Damping, numerator D_z
   - Natural frequency, denominator fn_n
   - Damping, denominator D_n
   - Used as bandstop filter
     - Center frequency fs: fn_z = fs
     - fn_n = fs
     - Bandwidth f_B: D_z = 0
     - D_n = f_B
   - Transfer function when used as general filter
     
     \[ H(s) = \frac{\frac{s^{2} + 2 \cdot D_z \cdot s + 2 \cdot D_n}{2 \cdot n \cdot \pi^{2} \cdot f_s^{2}}}{\frac{s + 1}{2 \cdot n \cdot \pi}} \]

7. Analog adder can be activated
   - The following applies to I = 1 signal: y = x_1 + x_2
   - The following applies to I = 0 signal: y = x_1

DO: All objects

fp_1022_08_eng.vsd Function diagram

SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3

Switch-on delay

Switch-off delay

Delay (switch-on and switch-off)
**Handling BICO technology**

**Binector:**
Binectors are binary signals that can be freely interconnected (BO = Binector Output). They represent a bit of a "BO:" display parameter (e.g. bit 15 from r0723).

**Connector:**
Connectors are "analog signals" that can be freely interconnected (e.g. percentage variables, speeds or torques). Connectors are also "CO:" display parameters (CO = Connector Output).

**Parameterization:**
At the signal destination, the required binector or connector is selected using appropriate parameters:
- "BI:" parameter for binectors (BI = Binector Input)
- "CI:" parameter for connectors (CI = Connector Input)

**Example:**
The main setpoint for the speed controller (CI: p1070) should be received from the output of the motorized potentiometer (CO: r1050) and the "jog" command (BI: p1055) from digital input DI 0 (BO: r0722.0, X133.1 terminal) on the CU305.

**Parameterizing steps:**
1. p1055[0] = 722.0 Terminal X133.1 acts as "Jog bit 0".
2. p1070[0] = 1050 The output of the motorized potentiometer acts as main setpoint for the speed controller.

---

**Table of parameters:**

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DO:</strong> All objects</td>
<td>fp_1030_98_eng.vsd</td>
<td>Function diagram</td>
<td>- 1030 -</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## 2.3 Overviews

### Function diagrams

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1510</td>
<td>CU305 input/output terminals</td>
<td>2-759</td>
</tr>
<tr>
<td>1520</td>
<td>PROFIdrive</td>
<td>2-760</td>
</tr>
<tr>
<td>1530</td>
<td>Internal control/status words, data sets</td>
<td>2-761</td>
</tr>
<tr>
<td>1550</td>
<td>Setpoint channel</td>
<td>2-762</td>
</tr>
<tr>
<td>1580</td>
<td>Servo control, encoder evaluations (position, speed, temperature)</td>
<td>2-763</td>
</tr>
<tr>
<td>1590</td>
<td>Servo control, speed control and U/f control</td>
<td>2-764</td>
</tr>
<tr>
<td>1610</td>
<td>Servo control, generation of the torque limits</td>
<td>2-765</td>
</tr>
<tr>
<td>1630</td>
<td>Servo control, current control</td>
<td>2-766</td>
</tr>
<tr>
<td>1750</td>
<td>Monitoring functions, faults, alarms</td>
<td>2-767</td>
</tr>
</tbody>
</table>
Fig. 2-5 1510 – CU305 input/output terminals

- 1510 - CU305 input/output terminals

DO: CU_S110 fp_1510_98_eng.vsd
Overviews - CU305 input/output terminals

Simulation for DI 0...DI 22
1 = Simulation on p0796.0...22

- 1510 -

<1> Fast measuring probe inputs.
<2> Jumper open, electrical isolation for DI 0...3
<3> There are the digital inputs DI 0...3, 8...11 and 16...22

4 digital inputs, electrically isolated

4 digital inputs/outputs, bidirectional

3 digital inputs, electrically isolated
1 digital output

4 digital inputs, electrically isolated

1 analog input
Interconnecting the permanently assigned receive telegrams.

Interconnecting the permanently assigned send telegrams.

Interconnecting the free receive telegram.

Interconnecting the free send telegram.
DO: All objects

Overviews - Internal control/status words, data sets

fp_1530_98_eng.vsd

Function diagram

SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3
<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>DO: SERVO</td>
<td>fp_1550_98_eng.vsd</td>
<td>Function diagram</td>
<td>SINAMICS S110</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Overviews - Setpoint channel**

**Fig. 2-8 1550 – Setpoint channel**

- **[3010]** Fixed speed setpoints
- **[3020]** Motorized potentiometer

**Fixed speed setpoints**

- Main setpoint `p1070`
- Supplementary setpoint `p1079`

**Main/supplementary setpoint, setpoint scaling, jogging**

- Jog setpoint 1 `p1058`
- Jog setpoint 2 `p1059`

**Direction of rotating limiting/changeover**

- `Setpt after limit`
- `RFG n_set at outp`

**Ramp-function generator selection, status word, tracking**

- `RFG selection p1115`
- `RFG n_set at outp p1155`
- `n_ctrl setp sum p1150`

**Ramp-function generator tracking**

- `M_limit`
- `ZSW`
- `Ramp-function generator tracking`

**Ramp-function generator tracking**

- `n_act`
- `M_limit`

**Simulate ramp-function generator**

- `250 μs`
- `4000.00 μs`
Fig. 2-9 1580 – Servo control, encoder evaluations (position, speed, temperature)

Position sensing for encoders

DO: SERVO

Function diagram

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Closed-loop speed control, servo with encoder

Function diagram

Fig. 2-10 1590 – Servo control, speed control and U/f control

DO: SERVO

Overviews - Servo control, speed control and V/f control
Fig. 2-11 1610 – Servo control, generation of the torque limits

The 4 quadrants

- + - +
- + - +
- + - +
- + - +

Overviews

- Servo control, generation of the torque limits

Torque limit input

- 1610 -

Function diagrams

fp_1610_98_eng.vsd

Function diagram

DO: SERVO

Overviews - Servo control, generation of the torque limits

Fig. 2-11 1610 – Servo control, generation of the torque limits

Overviews

Func...
Iq controller
[1590.8]

Iq_set

M_set_6

Iq

U_quad_set

r0077

|U|

r1733

+ –

TransAdaptation

M2Iq

r0072

Kp

U_output

~
M

[5710] Current setpoint filter
U

Kp
Id_set
r0075

U_direct-axis_set
r1732

+ –

formation

Id controller
[5714] Current controller

Motor model
I_act U
r0069[0]

Id_act
r0076

TransI_act V
r0069[1]

Motor type
SM
Field current input
synchronous motor

Iq_act
r0078[0]

I_act W
r0069[2]

Limit
ASM
formation
Flux setpoint (input)
Induction motor
Flux controller

[5730] Control signals, current actual values

[5722] Field current input, flux controller

1
2
DO: SERVO
Overviews - Servo control, current control

3

4

5

6
fp_1630_98_eng.vsd
18.10.10 V04.04.00

7
Function diagram
SINAMICS S110

8
- 1630 -

Function diagrams

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1630 – Servo control, current control

Overviews

2-766

Fig. 2-12

Power module


2.4  CU305 input/output terminals

<table>
<thead>
<tr>
<th>Function diagrams</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020 – Digital inputs, electrically isolated (DI 0 to DI 3)</td>
<td>2-769</td>
</tr>
<tr>
<td>2021 – Digital inputs, electrically isolated (DI 16 to DI 19)</td>
<td>2-770</td>
</tr>
<tr>
<td>2022 – Digital inputs, electrically isolated (DI 20 to DI 22)</td>
<td>2-771</td>
</tr>
<tr>
<td>2030 – Digital inputs/outputs, bidirectional (DI/DO 8 to DI/DO 9)</td>
<td>2-772</td>
</tr>
<tr>
<td>2031 – Digital inputs/outputs, bidirectional (DI/DO 10 to DI/DO 11)</td>
<td>2-773</td>
</tr>
<tr>
<td>2038 – Digital output (DO 16)</td>
<td>2-774</td>
</tr>
<tr>
<td>2040 – Analog input (AI)</td>
<td>2-775</td>
</tr>
</tbody>
</table>
CU305 input/output terminals - Digital inputs, electrically isolated (DI 0 to DI 3)

<1> When using the electrical isolation, omit the terminal jumper and connect the load power supply shown as a dashed line.

<1> When using the electrical isolation, omit the terminal jumper and connect the load power supply shown as a dashed line.

DI 0 ... DI 3 inverted

DO: CU_S110

CU305 input/output terminals - Digital inputs, electrically isolated (DI 0 to DI 3)
When using the electrical isolation, omit the terminal jumper and connect the load power supply shown as a dashed line.
When using the electrical isolation, omit the terminal jumper and connect the load power supply shown as a dashed line.

<1> When using the electrical isolation, omit the terminal jumper and connect the load power supply shown as a dashed line.
2030 – Digital inputs/outputs, bidirectional (DI/DO 8 to DI/DO 9)

<table>
<thead>
<tr>
<th>Function diagrams</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CU305 input/output terminals</strong></td>
</tr>
<tr>
<td><strong>SINAMICS S110</strong></td>
</tr>
</tbody>
</table>

- **<1>** The connection shown as a dashed line applies when used as digital output (p0728.x = 1).
- **<2>** Can be used as fast measuring probe inputs (refer to [4735], [4740]).
- **<3>** The digital output access authority is displayed in r0729.

**DO: CU_S110**

- **CU 305**
- **26.03.09 V04.00.00**
- **Function diagram**

---

**CU305 In/Output terminals**

- **24 V DC to the next device**
- **X124.**
- **DI/DO 8 - 9**
- **+24 V**
- **5 V**
- **R0727.9**
- **R0721.9**
- **R0727.8**
- **R0721.8**
- **R0747.9**
- **R0747.8**
- **X132.1**
- **X132.2**
- **X132.5**
- **DO 9 Probe**
- **4000.00 µs**

---

**Note:**
- The connection shown as a dashed line applies when used as digital output (p0728.x = 1).
- Can be used as fast measuring probe inputs (refer to [4735], [4740]).
- The digital output access authority is displayed in r0729.
Fig. 2-18  
2031 – Digital inputs/outputs, bidirectional (DI/DO 10 to DI/DO 11)  

1. The connection shown as a dashed line applies when used as digital output (p0728.x = 1).  
2. Can be used as fast measuring probe inputs (refer to [4735], [4740]).  
3. The digital output access authority is displayed in r0729.

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DO:</strong> CU_S110</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CU305 input/output terminals - Digital inputs/outputs, bidirectional (DI/DO 10 to DI/DO 11)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Fig. 2-19  2038 – Digital output (DO 16)

<1> Additional external I/O supply  
<2> For restrictions, refer to p0746.

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>DO: CU_S110</td>
<td>fp_2038_98_eng.vsd</td>
<td>Function diagram</td>
<td>Function diagrams</td>
<td>2038 - Digital output (DO 16)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CU305 input/output terminals - Digital output (DO 16)</td>
<td>2012</td>
<td>SINAMICS S110</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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DO: CU_S110
CU305 - Analog input (AI)

Fig. 2-20 2040 – Analog input (AI)

1. Caution: The voltage between an input and the grounding point must not exceed 35V.
2. Differential inputs! For input signals referred to ground, terminal 8 must be connected to the reference potential M.
3. When interconnected further, the output signals are referred to the reference quantities p2000 ... p2004 (100 % = p2004).
4. p0756 = 0: 0 V ... +10 V = 4: -10 V ... +10 V
2.5 PROFIdrive

Function diagrams

2410 – PROFIBUS (PB), addresses and diagnostics 2-778
2420 – Standard telegrams and process data 2-779
2422 – Manufacturer-specific telegrams and process data 2-780
2424 – Manufacturer-specific/free telegrams and process data 2-781
2439 – PZD receive signals, interconnection profile-specific 2-782
2440 – PZD receive signals, interconnection, manufacturer-specific 2-783
2442 – STW1 control word interconnection (p2038 = 0) 2-784
2443 – STW1 control word interconnection (p2038 = 1) 2-785
2444 – STW2 control word interconnection (p2038 = 0) 2-786
2445 – STW2 control word interconnection (p2038 = 1) 2-787
2449 – PZD send signals, interconnection, profile-specific 2-788
2450 – PZD send signals, interconnection, manufacturer-specific 2-789
2452 – ZSW1 status word interconnection (p2038 = 0) 2-790
2453 – ZSW1 status word interconnection (p2038 = 1) 2-791
2454 – ZSW2 status word interconnection (p2038 = 0) 2-792
2455 – ZSW2 status word interconnection (p2038 = 1) 2-793
2456 – MELDW status word interconnection 2-794
2462 – PosSTW-Pos control word interconnection (r0108.4 = 1) 2-795
2463 – POS_STW1 positioning control word 1 interconnection (r0108.4 = 1) 2-796
2464 – POS_STW2 positioning control word 2 interconnection (r0108.4 = 1) 2-797
2466 – POS_ZSW1 positioning status word 1 interconnection (r0108.4 = 1) 2-798
2467 – POS_ZSW2 positioning status word 2 interconnection (r0108.4 = 1) 2-799
2468 – IF1 receive telegram, free interconnection via BICO (p0922 = 999) 2-800
2470 – IF1 send telegram, free interconnection via BICO (p0922 = 999) 2-801
2472 – IF1 status words, free interconnection 2-802
2475 – STW1 control word 1 interconnection (r0108.4 = 1) 2-803
2476 – SATZANW-Pos block selection interconnection (r0108.4 = 1) 2-804
<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>2479</td>
<td>ZSW1 status word 1 interconnection (r0108.4 = 1)</td>
<td>2-805</td>
</tr>
<tr>
<td>2480</td>
<td>MDIMode interconnection (r0108.4 = 1)</td>
<td>2-806</td>
</tr>
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<td>2481</td>
<td>IF1 receive telegram, free interconnection via BICO (p0922 = 999)</td>
<td>2-807</td>
</tr>
<tr>
<td>2483</td>
<td>IF1 send telegram, free interconnection via BICO (p0922 = 999)</td>
<td>2-808</td>
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<td>2495</td>
<td>CU_STW control word, Control Unit interconnection</td>
<td>2-809</td>
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<td>CU_ZSW status word, Control Unit interconnection</td>
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<td>A_DIGITAL interconnection</td>
<td>2-811</td>
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<tr>
<td>2498</td>
<td>E_DIGITAL interconnection</td>
<td>2-812</td>
</tr>
</tbody>
</table>
Function diagrams

CU-specific functions

Setting the PROFIBUS address

Do: CU_S110, SERVO

Drive-specific functions (available once for each drive object)

Fig. 2-21 2410 – PROFIBUS (PB), addresses and diagnostics

PROFIdrive - PROFIBUS (PB)/PROFINET (PN), addresses and diagnostics

PROFINET address

PN Name of Station
r61000[0...239]

PN IP of Station
r61001[0...3]

PROFIBUS sampling time

Refer to [1020.7]

Alarm

Faults

Cyclic telegrams from the master

Sign-of-life from the clock cycle synchronous master

Monitoring functions

Alarms

Faults

<1> Indication of cyclic connection

<2> No cyclic telegrams from the master

<3> Only for the clock-cycle synchronous operation of the SERVO drive object.

<4> p2045 is automatically interconnected when the telegram is selected.

DO: CU_S110, SERVO

F01910 "PROFIBUS: Setpoint timeout"

No telegrams from the master

PD fault delay
0...100 s
p2044 (0)

F01921 "PROFIBUS: Receive setpoints after To"

A01920 "PROFIBUS: Interruption cyclic connection"

A01921 "PROFIBUS: Receive setpoints after To"

A01931 "PROFIBUS: Parameterizing telegram error"

A01900 "PROFIBUS: Configuration telegram error"

A01910 "PROFIBUS: Parameterizing telegram error"

A01902 "PROFIBUS: Operation parameterization not permissible"

A01901 "PROFIBUS: Parameterizing telegram error"

A01943 "PROFIBUS: Cycle signal faulted when establishing the bus"

A01944 "PROFIBUS: Sign-of-life synchronization not reached"

A01919 "PROFIBUS: Clock cycle synchronous operation synchronization unsuccessful"

A01930 "PROFIBUS: Current controller clock cycle cycle synchronous not equal"

A01940 "PROFIBUS: Clock cycle cycle synchronous not equal"

A01941 "PROFIBUS: Clock signal missing when establishing bus"

A01908 "PROFIBUS: Configuration telegram error"

A01907 "PROFIBUS: Parameterizing telegram error"

A01906 "PROFIBUS: Parameterizing telegram error"

A01905 "PROFIBUS: Parameterizing telegram error"

A01904 "PROFIBUS: Parameterizing telegram error"

A01903 "PROFIBUS: Parameterizing telegram error"

A01902 "PROFIBUS: Parameterizing telegram error"

A01901 "PROFIBUS: Parameterizing telegram error"

A01900 "PROFIBUS: Parameterizing telegram error"

<1> The monitoring function is only executed after at least one "valid" cyclic telegram has been received. "Valid" means: the master is in operation and net data are transmitted.

<2> The response monitoring time t_response is automatically defined when configuring PROFIBUS / PROFINET (PN) (e.g. HW Config made by SIEMENS)

<3> Only for the clock-cycle synchronous operation of the SERVO drive object.

<4> p2045 is automatically interconnected when the telegram is selected.

<5> The monitoring function is only executed after at least one "valid" cyclic telegram has been received. "Valid" means: the master is in operation and net data are transmitted.

<6> The response monitoring time t_response is automatically defined when configuring PROFIBUS / PROFINET (PN) (e.g. HW Config made by SIEMENS)

<7> Only for the clock-cycle synchronous operation of the SERVO drive object.

<8> p2045 is automatically interconnected when the telegram is selected.
Fig. 2-22 2420 – Standard telegrams and Process Data

INTERCONNECTION IS MADE ACCORDING TO

<table>
<thead>
<tr>
<th>Telegram</th>
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<th>5</th>
<th>6</th>
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<td>ZSW1</td>
<td>STW1</td>
<td>ZSW1</td>
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</table>

1 Depending on the drive object, only specific telegrams can be used.
2 If p0922 = 999 is changed to another value, the telegram is automatically assigned as specified in [2420] - [2424].
   If p0922 = 999 is changed to p0922 = 999, the "old" telegram assignment is maintained as specified in [2420] - [2424]!
3 The maximum number of P2D words depends on the drive object type.

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
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<th>4</th>
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<td>PROFIdrive - Standard telegrams and Process Data</td>
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Function diagram

fp_2420_98_eng.vsd

PROFIdrive - Standard telegrams and Process Data

16.11.10 V04.04.00 SINAMICS S110
### Fig. 2-23  Manufacturer-specific telegrams and Process Data

#### Interconnection is made according to

<table>
<thead>
<tr>
<th>Telegrams</th>
<th>102</th>
<th>103</th>
<th>110</th>
<th>111</th>
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<td>1, 4</td>
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<td>3</td>
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<td>NOLL_B</td>
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</table>

#### Notes:

1. Depending on the drive object, only specific telegrams can be used.
2. If p0922 = 999 is changed to another value, the telegram is automatically assigned as specified in [2420] - [2424].
   - If p0922 < 999 is changed to p0922 = 999, the "old" telegram assignment is maintained as specified in [2420] - [2424]!
3. Can be freely connected.
4. The maximum number of PZD words depends on the drive object type.

- Position encoder signal

---

**DO: SERVO**

**PROFIdrive - Manufacturer-specific telegrams and Process Data**

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**Fig. 2-24 2424 – Manufacturer-specific /free telegrams and Process Data**

**Function Diagram**

<table>
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<th>Telegram</th>
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<td>PZD31</td>
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- **<1>** Depending on the drive object, only specific telegrams can be used.
- **<2>** If p0922 = 999 is changed to another value, the telegram is automatically assigned as specified in [2420] - [2424].
  If p0922 = 999 is changed to p0922 = 999, the "old" telegram assignment is maintained as specified in [2420] - [2424].
- **<3>** In order to comply with the PROFIdrive profile, PZD1 must be used as control word 1 (STW1) or status word 1 (ZSW1).
  p2037 = 2 should be set if STW1 is not transferred with PZD1 as specified in the PROFIdrive profile.
- **<4>** The maximum number of PZD words depends on the drive object type.

---

**Manufacturer-specific/free telegrams and process data**

**Function Diagram**

**PROFIdrive** - Manufacturer-specific/free telegrams and Process Data

**Function diagram**

**PROFIdrive sampling time**

Refer to [1020.7]
## Signal receivers for PZD receive signals

<table>
<thead>
<tr>
<th>Signal</th>
<th>Meaning</th>
<th>PROFIdrive Signal No.</th>
<th>Interconnection parameter</th>
<th>Function diagram</th>
<th>Data type</th>
<th>Normalization</th>
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<td>p1070 (Err. Soll.) p1155</td>
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<td>36</td>
<td>p2644</td>
<td>[3618]</td>
<td>I16</td>
<td>4000 hex ≥ 100%</td>
</tr>
<tr>
<td>MDI_DEC</td>
<td>MDI deceleration override</td>
<td>37</td>
<td>p2645</td>
<td>[3618]</td>
<td>I16</td>
<td>4000 hex ≥ 100%</td>
</tr>
<tr>
<td>MDI_MOD</td>
<td>MDI mode</td>
<td>38</td>
<td>(bit-by-bit)</td>
<td></td>
<td></td>
<td>-</td>
</tr>
</tbody>
</table>

1. When selecting a standard telegram or a manufacturer-specific telegram via p0922, these interconnection parameters of the command data set CDS0 are automatically set.
2. Data type according to the PROFIdrive profile: I16 = Integer16, I32 = Integer32, U16 = Unsigned16, U32 = Unsigned32.
### Signal receivers for PZD receive signals

<table>
<thead>
<tr>
<th>Signal</th>
<th>Meaning</th>
<th>Signal No.</th>
<th>Interconnection parameter</th>
<th>Function diagram</th>
<th>Data type</th>
<th>Normalization</th>
</tr>
</thead>
<tbody>
<tr>
<td>MOMRED</td>
<td>Torque reduction</td>
<td>101</td>
<td>p1542</td>
<td>[5610.2]</td>
<td>I16</td>
<td>4000 hex 2 p2003</td>
</tr>
<tr>
<td>MT_STW</td>
<td>Measuring probe control word</td>
<td>130</td>
<td>p0682</td>
<td>-</td>
<td>U16</td>
<td></td>
</tr>
<tr>
<td>POS_STW</td>
<td>Pos control word</td>
<td>203</td>
<td>(bitwise)</td>
<td>[2462]</td>
<td>U16</td>
<td></td>
</tr>
<tr>
<td>OVERRIDE</td>
<td>Pos velocity override</td>
<td>205</td>
<td>p2648</td>
<td>[3630]</td>
<td>I16</td>
<td>4000 hex 2 100%</td>
</tr>
<tr>
<td>POS_STW1</td>
<td>Pos control word 1</td>
<td>220</td>
<td>(bitwise)</td>
<td>[2463]</td>
<td>U16</td>
<td></td>
</tr>
<tr>
<td>POS_STW2</td>
<td>Pos control word 2</td>
<td>222</td>
<td>(bitwise)</td>
<td>[2464]</td>
<td>U16</td>
<td></td>
</tr>
<tr>
<td>MDI_MOD</td>
<td>Pos MDI mode</td>
<td>229</td>
<td>p2654</td>
<td>[3620]</td>
<td>U16</td>
<td></td>
</tr>
<tr>
<td>CU_STW1</td>
<td>Control word 1 for Control Unit</td>
<td>500</td>
<td>(bitwise)</td>
<td>[2495]</td>
<td>U16</td>
<td></td>
</tr>
</tbody>
</table>

<1> When selecting a standard telegram or a manufacturer-specific telegram via p0922, these interconnection parameters of the command data set CDS0 are automatically set.

<2> Data type according to the PROFIdrive profile: I16 = Integer16, I32 = Integer32, U16 = Unsigned16, U32 = Unsigned32.
### Signal targets for STW1 in Interface Mode SINAMICS (p2038 = 0)

<table>
<thead>
<tr>
<th>Signal</th>
<th>Meaning</th>
<th>Interconnection parameters</th>
<th>Function diagram internal control word</th>
<th>Function diagram signal target</th>
<th>Inverted</th>
</tr>
</thead>
<tbody>
<tr>
<td>STW1.0</td>
<td>ON (pulses can be enabled) 0 = OFF1 (braking with ramp-function generator, then pulse cancellation and ready-to-power-up)</td>
<td>p0840[0] = r2090.0</td>
<td>[2501.3]</td>
<td>[2610]</td>
<td>-</td>
</tr>
<tr>
<td>STW1.1</td>
<td>1 = No OFF2 (enable is possible) 0 = OFF2 (immediate pulse cancellation and power-on inhibit)</td>
<td>p0844[0] = r2090.1</td>
<td>[2501.3]</td>
<td>[2610]</td>
<td>-</td>
</tr>
<tr>
<td>STW1.2</td>
<td>1 = No OFF3 (enable possible) 0 = OFF3 (braking with the OFF3 ramp p1135, then pulse cancellation and power-on inhibit)</td>
<td>p0848[0] = r2090.2</td>
<td>[2501.3]</td>
<td>[2610]</td>
<td>-</td>
</tr>
<tr>
<td>STW1.3</td>
<td>1 = Enable operation (pulses can be enabled) 0 = Inhibit operation (cancel pulses)</td>
<td>p0852[0] = r2090.3</td>
<td>[2501.3]</td>
<td>[2610]</td>
<td>-</td>
</tr>
<tr>
<td>STW1.4</td>
<td>1 = Operating condition (the ramp-function generator can be enabled) 0 = Inhibit ramp-function generator (set the ramp-function generator output to zero)</td>
<td>p1140[0] = r2090.4</td>
<td>[2501.3]</td>
<td>[3060] [3070] [3080]</td>
<td>-</td>
</tr>
<tr>
<td>STW1.5</td>
<td>1 = Enable the ramp-function generator 0 = Stop the ramp-function generator (freeze the ramp-function generator output)</td>
<td>p1141[0] = r2090.5</td>
<td>[2501.3]</td>
<td>[3060] [3070]</td>
<td>-</td>
</tr>
<tr>
<td>STW1.6</td>
<td>1 = Enable setpoint 0 = Inhibit setpoint (set the ramp-function generator input to zero)</td>
<td>p1142[0] = r2090.6</td>
<td>[2501.3]</td>
<td>[3060] [3070] [3080]</td>
<td>-</td>
</tr>
<tr>
<td>STW1.7</td>
<td>1 = 1. Acknowledge faults</td>
<td>p2103[0] = r2090.7</td>
<td>[2546.1]</td>
<td>[8060]</td>
<td>-</td>
</tr>
<tr>
<td>STW1.8</td>
<td>Reserved</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>STW1.9</td>
<td>Reserved</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>STW1.10</td>
<td>1 = Control via PLC &lt;2&gt;</td>
<td>p0854[0] = r2090.10</td>
<td>[2501.3]</td>
<td>[2501]</td>
<td>-</td>
</tr>
<tr>
<td>STW1.11</td>
<td>1 = Setpoint inversion</td>
<td>p1113[0] = r2090.11</td>
<td>[2505.3]</td>
<td>[3040]</td>
<td>-</td>
</tr>
<tr>
<td>STW1.12</td>
<td>Reserved</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>STW1.13</td>
<td>1 = Motorized potentiometer setpoint raise</td>
<td>p1035[0] = r2090.13</td>
<td>[2505.3]</td>
<td>[3020]</td>
<td>-</td>
</tr>
<tr>
<td>STW1.14</td>
<td>1 = Motorized potentiometer setpoint lower</td>
<td>p1036[0] = r2090.14</td>
<td>[2505.3]</td>
<td>[3020]</td>
<td>-</td>
</tr>
<tr>
<td>STW1.15</td>
<td>Reserved</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

<1> Used in telegrams 1, 2, 3, 4, 7, 9, 110, 111.

<2> STW1.10 must be set to ensure that the drive object accepts the process data (P2D).
### Signal targets for STW1 in Interface Mode SIMODRIVE 611 universal (p2038 = 1)

<table>
<thead>
<tr>
<th>Signal</th>
<th>Meaning</th>
<th>Interconnection parameters</th>
<th>Function diagram internal control word</th>
<th>Function diagram signal target</th>
<th>Inverted</th>
</tr>
</thead>
<tbody>
<tr>
<td>STW1.0</td>
<td>= ON (pulses can be enabled) 0 = OFF1 (braking with ramp-function generator, then pulse cancellation, ready-to-power-up)</td>
<td>p0840[0] = r2090.0</td>
<td>[2501.3]</td>
<td>[2610]</td>
<td>-</td>
</tr>
<tr>
<td>STW1.1</td>
<td>1 = No OFF2 (enable is possible) 0 = OFF2 (immediate pulse cancellation and power-on inhibit)</td>
<td>p0844[0] = r2090.1</td>
<td>[2501.3]</td>
<td>[2610]</td>
<td>-</td>
</tr>
<tr>
<td>STW1.2</td>
<td>1 = No OFF3 (enable possible) 0 = OFF3 (braking with the OFF3 ramp p1135, then pulse cancellation and power-on inhibit)</td>
<td>p0848[0] = r2090.2</td>
<td>[2501.3]</td>
<td>[2610]</td>
<td>-</td>
</tr>
<tr>
<td>STW1.3</td>
<td>1 = Enable operation (pulses can be enabled) 0 = inhibit operation (cancel pulses)</td>
<td>p0852[0] = r2090.3</td>
<td>[2501.3]</td>
<td>[2610]</td>
<td>-</td>
</tr>
<tr>
<td>STW1.4</td>
<td>1 = Operating condition (the ramp-function generator can be enabled) 0 = inhibit ramp-function generator (set the ramp-function generator output to zero)</td>
<td>p1140[0] = r2090.4</td>
<td>[2501.3]</td>
<td>[3060] [3070] [3080]</td>
<td>-</td>
</tr>
<tr>
<td>STW1.5</td>
<td>1 = Enable the ramp-function generator 0 = stop the ramp-function generator (freeze the ramp-function generator output)</td>
<td>p1141[0] = r2090.5</td>
<td>[2501.3]</td>
<td>[3060] [3070]</td>
<td>-</td>
</tr>
<tr>
<td>STW1.6</td>
<td>1 = Enable setpoint 0 = inhibit setpoint (set the ramp-function generator input to zero)</td>
<td>p1142[0] = r2090.6</td>
<td>[2501.3]</td>
<td>[3060] [3070] [3080]</td>
<td>-</td>
</tr>
<tr>
<td>STW1.7</td>
<td>= Acknowledge faults</td>
<td>p2103[0] = r2090.7</td>
<td>[2546.1]</td>
<td>[8060]</td>
<td>-</td>
</tr>
<tr>
<td>STW1.8</td>
<td>Reserved</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>STW1.9</td>
<td>Reserved</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>STW1.10</td>
<td>1 = Control via PLC</td>
<td>p0854[0] = r2090.10</td>
<td>[2501.3]</td>
<td>[2501]</td>
<td>-</td>
</tr>
<tr>
<td>STW1.11</td>
<td>1 = Ramp-function generator active</td>
<td>p2148[0] = r2090.11</td>
<td>-</td>
<td>[8010]</td>
<td>-</td>
</tr>
<tr>
<td>STW1.12</td>
<td>1 = Unconditionally open the holding brake</td>
<td>p0855[0] = r2090.12</td>
<td>[2501.3]</td>
<td>[2701]</td>
<td>-</td>
</tr>
<tr>
<td>STW1.13</td>
<td>Reserved</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>STW1.14</td>
<td>1 = Closed-loop torque control active 0 = Closed-loop speed control active</td>
<td>p1501[0] = r2090.14</td>
<td>[2520.3]</td>
<td>[5060]</td>
<td>-</td>
</tr>
<tr>
<td>STW1.15</td>
<td>Reserved</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

<1> Used in telegrams 1, 2, 3, 4, 102, 103.

<2> STW1.10 must be set to ensure that the drive object accepts the process data (P2D).

#### Signal Meanings

- **STW1.0**:
  - ON: Pulses can be enabled.
  - OFF1: Braking with ramp-function generator, then pulse cancellation, ready-to-power-up.
- **STW1.1**: 1 = No OFF2: Enable is possible; 0 = OFF2: Immediate pulse cancellation and power-on inhibit.
- **STW1.2**: 1 = No OFF3: Enable possible; 0 = OFF3: Braking with the OFF3 ramp p1135, then pulse cancellation and power-on inhibit.
- **STW1.3**: 1 = Enable operation: Pulses can be enabled; 0 = Inhibit operation: Cancel pulses.
- **STW1.4**: 1 = Operating condition: Ramp-function generator can be enabled; 0 = Inhibit ramp-function generator: Set output to zero.
- **STW1.5**: 1 = Enable the ramp-function generator; 0 = Stop the ramp-function generator: Freeze output.
- **STW1.6**: 1 = Enable setpoint; 0 = Inhibit setpoint: Set input to zero.
- **STW1.7**: = Acknowledge faults.
- **STW1.8** and **STW1.9**: Reserved.
- **STW1.10**: 1 = Control via PLC.
- **STW1.11**: 1 = Ramp-function generator active.
- **STW1.12**: 1 = Unconditionally open the holding brake.
- **STW1.14**: 1 = Closed-loop torque control active; 0 = Closed-loop speed control active.
- **STW1.15**: Reserved.

#### Function Diagram

- **Function diagram**: fp_2443_98_eng.vsd
- **Function diagram sampling time**
- **PROFdrive - STW1 control word interconnection (p2038 = 1)**

---

**SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3**
### Signal targets for STW2 in Interface Mode SINAMICS (p2038 = 0)

<table>
<thead>
<tr>
<th>Signal</th>
<th>Meaning</th>
<th>Interconnection parameters</th>
<th>Internal control word</th>
<th>Signal target</th>
<th>Inverted</th>
</tr>
</thead>
<tbody>
<tr>
<td>STW2.0</td>
<td>Drive data set selection DDS, bit 0</td>
<td>p0820[0] = r2093.0</td>
<td>-</td>
<td>[8565]</td>
<td>-</td>
</tr>
<tr>
<td>STW2.1</td>
<td>Drive data set selection DDS, bit 1</td>
<td>p0821[0] = r2093.1</td>
<td>-</td>
<td>[8565]</td>
<td>-</td>
</tr>
<tr>
<td>STW2.2</td>
<td>Drive data set selection DDS, bit 2</td>
<td>p0822[0] = r2093.2</td>
<td>-</td>
<td>[8565]</td>
<td>-</td>
</tr>
<tr>
<td>STW2.3</td>
<td>Drive data set selection DDS, bit 3</td>
<td>p0823[0] = r2093.3</td>
<td>-</td>
<td>[8565]</td>
<td>-</td>
</tr>
<tr>
<td>STW2.4</td>
<td>Drive data set selection DDS, bit 4</td>
<td>p0824[0] = r2093.4</td>
<td>-</td>
<td>[8565]</td>
<td>-</td>
</tr>
<tr>
<td>STW2.5</td>
<td>Reserved</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>STW2.6</td>
<td>Reserved</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>STW2.7</td>
<td>1 = Parking axis</td>
<td>p0897 = r2093.7</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>STW2.8</td>
<td>1 = Traverse to fixed endstop</td>
<td>p1545[0] = r2093.8</td>
<td>[2520.2]</td>
<td>[8012]</td>
<td>-</td>
</tr>
<tr>
<td>STW2.9</td>
<td>Reserved</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>STW2.10</td>
<td>Reserved</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>STW2.11</td>
<td>1 = Motor changeover, feedback Signal</td>
<td>p0828[0] = r2093.11</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>STW2.12</td>
<td>Master sign-of-life, bit 0</td>
<td>p2045 = r2050[3]</td>
<td>-</td>
<td>[2410]</td>
<td>-</td>
</tr>
<tr>
<td>STW2.13</td>
<td>Master sign-of-life, bit 1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>STW2.14</td>
<td>Master sign-of-life, bit 2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>STW2.15</td>
<td>Master sign-of-life, bit 3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Signal Parameters**
- **1** Used in telegrams 2, 3, 4, 7, 9, 110 and 111.
- **2** Not for telegrams 9, 110, and 111.
- **3** Only for telegram 9.

---

**Refer to [1020.7]**
### Signal targets for STW2 in Interface Mode SIMODRIVE 611 universal (p2038 = 1)

<table>
<thead>
<tr>
<th>Signal</th>
<th>Meaning</th>
<th>Interconnection parameters</th>
<th>(Function diagram) internal control word</th>
<th>(Function diagram) signal target</th>
<th>Inverted</th>
</tr>
</thead>
<tbody>
<tr>
<td>STW2.0</td>
<td>Drive data set selection DDS, bit 0</td>
<td>p0820[0] = r2093.0</td>
<td>-</td>
<td>[8565]</td>
<td>-</td>
</tr>
<tr>
<td>STW2.1</td>
<td>Reserved</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>STW2.2</td>
<td>Reserved</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>STW2.3</td>
<td>Reserved</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>STW2.4</td>
<td>1 = Bypass ramp-function generator</td>
<td>p1122[0] = r2093.4</td>
<td>-</td>
<td>[3060] [3070]</td>
<td>-</td>
</tr>
<tr>
<td>STW2.5</td>
<td>Reserved</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>STW2.6</td>
<td>1 = Integrator inhibit, speed controller</td>
<td>p1477[0] = r2093.6</td>
<td>-</td>
<td>[5040] [5210]</td>
<td>-</td>
</tr>
<tr>
<td>STW2.7</td>
<td>1 = Parking axis selection</td>
<td>p0897 = r2093.7</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>STW2.8</td>
<td>1 = Traverse to fixed endstop</td>
<td>p1545[0] = r2093.8</td>
<td>[2520.2]</td>
<td>[8012]</td>
<td>-</td>
</tr>
<tr>
<td>STW2.9</td>
<td>Reserved</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>STW2.10</td>
<td>Reserved</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>STW2.11</td>
<td>Motor changeover, feedback signal</td>
<td>p0828[0] = r2093.11</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>STW2.12</td>
<td>Master sign-of-life, bit 0</td>
<td>p2045 = r2050[3]</td>
<td>-</td>
<td>[2410]</td>
<td>-</td>
</tr>
<tr>
<td>STW2.13</td>
<td>Master sign-of-life, bit 1</td>
<td></td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>STW2.14</td>
<td>Master sign-of-life, bit 2</td>
<td></td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>STW2.15</td>
<td>Master sign-of-life, bit 3</td>
<td></td>
<td>-</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<1> Used in telegrams 2, 3, 4, 102, 103.

<2> For a 1 signal, the integral component of the speed controller is cleared and the integrator is inhibited.

<3> Only if the function module "extended setpoint channel" is active (r0108.8 = 1).

---

**Signal targets**

**Signal targets**

<table>
<thead>
<tr>
<th>Signal</th>
<th>Meaning</th>
<th>Interconnection parameters</th>
<th>(Function diagram) internal control word</th>
<th>(Function diagram) signal target</th>
<th>Inverted</th>
</tr>
</thead>
<tbody>
<tr>
<td>STW2.0</td>
<td>Drive data set selection DDS, bit 0</td>
<td>p0820[0] = r2093.0</td>
<td>-</td>
<td>[8565]</td>
<td>-</td>
</tr>
<tr>
<td>STW2.1</td>
<td>Reserved</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>STW2.2</td>
<td>Reserved</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>STW2.3</td>
<td>Reserved</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>STW2.4</td>
<td>1 = Bypass ramp-function generator</td>
<td>p1122[0] = r2093.4</td>
<td>-</td>
<td>[3060] [3070]</td>
<td>-</td>
</tr>
<tr>
<td>STW2.5</td>
<td>Reserved</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>STW2.6</td>
<td>1 = Integrator inhibit, speed controller</td>
<td>p1477[0] = r2093.6</td>
<td>-</td>
<td>[5040] [5210]</td>
<td>-</td>
</tr>
<tr>
<td>STW2.7</td>
<td>1 = Parking axis selection</td>
<td>p0897 = r2093.7</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>STW2.8</td>
<td>1 = Traverse to fixed endstop</td>
<td>p1545[0] = r2093.8</td>
<td>[2520.2]</td>
<td>[8012]</td>
<td>-</td>
</tr>
<tr>
<td>STW2.9</td>
<td>Reserved</td>
<td>-</td>
<td>-</td>
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<tr>
<td>STW2.10</td>
<td>Reserved</td>
<td>-</td>
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<td>-</td>
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<tr>
<td>STW2.11</td>
<td>Motor changeover, feedback signal</td>
<td>p0828[0] = r2093.11</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>STW2.12</td>
<td>Master sign-of-life, bit 0</td>
<td>p2045 = r2050[3]</td>
<td>-</td>
<td>[2410]</td>
<td>-</td>
</tr>
<tr>
<td>STW2.13</td>
<td>Master sign-of-life, bit 1</td>
<td></td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>STW2.14</td>
<td>Master sign-of-life, bit 2</td>
<td></td>
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<tr>
<td>STW2.15</td>
<td>Master sign-of-life, bit 3</td>
<td></td>
<td>-</td>
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<td></td>
</tr>
</tbody>
</table>

<1> Used in telegrams 2, 3, 4, 102, 103.

<2> For a 1 signal, the integral component of the speed controller is cleared and the integrator is inhibited.

<3> Only if the function module "extended setpoint channel" is active (r0108.8 = 1).
### Signal sources for PZD send signals

<table>
<thead>
<tr>
<th>Signal</th>
<th>Description</th>
<th>PROFIdrive Signal No.</th>
<th>Interconnection parameter</th>
<th>Function diagram</th>
<th>Data type</th>
<th>Normalization</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZSW1</td>
<td>Status word 1</td>
<td>2</td>
<td>r2089[0]</td>
<td>[2452][2453][2479]</td>
<td>U16</td>
<td></td>
</tr>
<tr>
<td>ZSW2</td>
<td>Status word 2</td>
<td>4</td>
<td>r2089[1]</td>
<td>[2454][2455]</td>
<td>U16</td>
<td></td>
</tr>
<tr>
<td>NIST_A</td>
<td>Speed setpoint A (16 bit)</td>
<td>6</td>
<td>r0063</td>
<td>[4710]</td>
<td>I16</td>
<td></td>
</tr>
<tr>
<td>NIST_B</td>
<td>Speed setpoint B (32 bit)</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G1_ZSW</td>
<td>Encoder 1 status word</td>
<td>10</td>
<td>r0481[0]</td>
<td>[4730]</td>
<td>U16</td>
<td></td>
</tr>
<tr>
<td>G1_XIST1</td>
<td>Encoder 1 actual position 1</td>
<td>11</td>
<td>r0482[0]</td>
<td>[4704]</td>
<td>U16</td>
<td></td>
</tr>
<tr>
<td>G1_XIST2</td>
<td>Encoder 1 actual position 2</td>
<td>12</td>
<td>r0483[0]</td>
<td>[4704]</td>
<td>U32</td>
<td></td>
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<tr>
<td>G2_ZSW</td>
<td>Encoder 2 status word</td>
<td>14</td>
<td>r0481[1]</td>
<td>[4730]</td>
<td>U16</td>
<td></td>
</tr>
<tr>
<td>G2_XIST1</td>
<td>Encoder 2 actual position 1</td>
<td>15</td>
<td>r0482[1]</td>
<td>[4704]</td>
<td>U32</td>
<td></td>
</tr>
<tr>
<td>G2_XIST2</td>
<td>Encoder 2 actual position 2</td>
<td>16</td>
<td>r0483[1]</td>
<td>[4704]</td>
<td>U32</td>
<td></td>
</tr>
<tr>
<td>E_DIGITAL</td>
<td>Digital inputs</td>
<td>21</td>
<td>r2089[2]</td>
<td>[2459]</td>
<td>U16</td>
<td></td>
</tr>
<tr>
<td>XIST_A</td>
<td>Position actual value A</td>
<td>28</td>
<td>r2521[0]</td>
<td>[4010]</td>
<td>I32</td>
<td></td>
</tr>
<tr>
<td>AKTSATZ</td>
<td>Pos selected block</td>
<td>33</td>
<td>r2670</td>
<td>[3650]</td>
<td>U16</td>
<td></td>
</tr>
</tbody>
</table>

**<1>** Data type according to the PROFIdrive profile: I16 = Integer16, I32 = Integer32, U16 = Unsigned16, U32 = Unsigned32

**<2>** Send words 1...16
p2051[0...15] WORD
r2089[0...15] WORD
p2063[0...14] DWORD
r2063[0...14] DWORD

**<3>** Drive object n

**<4>** Normalization
4000 hex p2000
4000 0000 hex p2000
Fig. 2-32  2450 – PZD send signals, interconnection manufacturer-specific

**Signal sources for PZD send signals**

<table>
<thead>
<tr>
<th>Signal</th>
<th>Description</th>
<th>PROFIdrive Signal No.</th>
<th>Interconnection parameter</th>
<th>Function diagram</th>
<th>Data type</th>
<th>Normalization</th>
</tr>
</thead>
<tbody>
<tr>
<td>MELDW</td>
<td>Message word</td>
<td>102</td>
<td>r2089[3]</td>
<td>[2456]</td>
<td>U16</td>
<td></td>
</tr>
<tr>
<td>MT_ZSW</td>
<td>Measuring probe status word</td>
<td>131</td>
<td>r0888</td>
<td>-</td>
<td>U16</td>
<td></td>
</tr>
<tr>
<td>MT1_ZS_F</td>
<td>Measuring probe 1 measuring time, falling edge</td>
<td>132</td>
<td>r0887[0]</td>
<td>-</td>
<td>U16</td>
<td></td>
</tr>
<tr>
<td>MT1_ZS_S</td>
<td>Measuring probe 1 measuring time, rising edge</td>
<td>133</td>
<td>r0886[0]</td>
<td>-</td>
<td>U16</td>
<td></td>
</tr>
<tr>
<td>MT2_ZS_F</td>
<td>Measuring probe 2 measuring time, falling edge</td>
<td>134</td>
<td>r0887[1]</td>
<td>-</td>
<td>U16</td>
<td></td>
</tr>
<tr>
<td>MT2_ZS_S</td>
<td>Measuring probe 2 measuring time, rising edge</td>
<td>135</td>
<td>r0886[1]</td>
<td>-</td>
<td>U16</td>
<td></td>
</tr>
<tr>
<td>POS_ZSW</td>
<td>Pos status word</td>
<td>204</td>
<td>r2883</td>
<td>[3645]</td>
<td>U16</td>
<td></td>
</tr>
<tr>
<td>POS_ZSW1</td>
<td>Pos status word 1</td>
<td>221</td>
<td>r2089[3]</td>
<td>[2446]</td>
<td>U16</td>
<td></td>
</tr>
<tr>
<td>POS_ZSW2</td>
<td>Pos status word 2</td>
<td>222</td>
<td>r2089[4]</td>
<td>[2447]</td>
<td>U16</td>
<td></td>
</tr>
<tr>
<td>FAULT_CODE</td>
<td>Fault code</td>
<td>301</td>
<td>r2131</td>
<td>[8060]</td>
<td>U16</td>
<td></td>
</tr>
<tr>
<td>WARN_CODE</td>
<td>Alarm code</td>
<td>303</td>
<td>r2132</td>
<td>[8065]</td>
<td>U16</td>
<td></td>
</tr>
<tr>
<td>CU_ZSW1</td>
<td>Status word 1 for Control Unit</td>
<td>501</td>
<td>r2089[1]</td>
<td>[2496]</td>
<td>U16</td>
<td></td>
</tr>
</tbody>
</table>

**<1>** Data type according to the PROFIdrive profile: I16 = Integer16, I32 = Integer32, U16 = Unsigned16, U32 = Unsigned32

---

**Function diagrams**

**DO: SERVO**

**PROFIdrive - PZD send signals interconnection manufacturer-specific**

---

**PROFIdrive send telegram**

- **Header**
- **Drive object 1**
- **Drive object 2**
- **Drive object n**
- **Driver object m**
- **Trailer**

---

**PROFIBUS PROFINET**

---

**PROFIdrive sampling time**

Refer to [1020.7]
### Signal sources for ZSW1 im Interface Mode SINAMICS (p2038 = 0)

<table>
<thead>
<tr>
<th>Signal</th>
<th>Meaning</th>
<th>Interconnection parameters</th>
<th>Function diagram internal status word</th>
<th>Function diagram signal source</th>
<th>Inverted</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZSW1.0</td>
<td>1 = Ready to power-up</td>
<td>p2080[0] = 0899.0</td>
<td>[2503.7]</td>
<td>[2610]</td>
<td>-</td>
</tr>
<tr>
<td>ZSW1.1</td>
<td>1 = Ready to operate</td>
<td>p2080[1] = 0899.1</td>
<td>[2503.7]</td>
<td>[2610]</td>
<td>-</td>
</tr>
<tr>
<td>ZSW1.2</td>
<td>1 = Operation enabled</td>
<td>p2080[2] = 0899.2</td>
<td>[2503.7]</td>
<td>[2610]</td>
<td>-</td>
</tr>
<tr>
<td>ZSW1.3</td>
<td>1 = Fault present</td>
<td>p2080[3] = 2139.3</td>
<td>[2548.7]</td>
<td>[8060]</td>
<td>-</td>
</tr>
<tr>
<td>ZSW1.4</td>
<td>1 = No coast down active (OFF2 inactive)</td>
<td>p2080[4] = 0899.4</td>
<td>[2503.7]</td>
<td>[2610]</td>
<td>-</td>
</tr>
<tr>
<td>ZSW1.5</td>
<td>1 = No fast stop active (OFF3 inactive)</td>
<td>p2080[5] = 0899.5</td>
<td>[2503.7]</td>
<td>[2610]</td>
<td>-</td>
</tr>
<tr>
<td>ZSW1.6</td>
<td>1 = Power-on inhibit active</td>
<td>p2080[6] = 0899.6</td>
<td>[2503.7]</td>
<td>[2610]</td>
<td>-</td>
</tr>
<tr>
<td>ZSW1.7</td>
<td>1 = Alarm present</td>
<td>p2080[7] = 2139.7</td>
<td>[2548.7]</td>
<td>[8060]</td>
<td>-</td>
</tr>
<tr>
<td>ZSW1.8</td>
<td>1 = Speed setpoint - actual value deviation within tolerance t_off</td>
<td>p2080[8] = 2197.7</td>
<td>[2534.7]</td>
<td>[8010]</td>
<td>-</td>
</tr>
<tr>
<td>ZSW1.9</td>
<td>1 = Control requested</td>
<td>p2080[9] = 0899.9</td>
<td>[2503.7]</td>
<td>[2503]</td>
<td>-</td>
</tr>
<tr>
<td>ZSW1.10</td>
<td>1 = f or n comparison value reached/exceeded</td>
<td>p2080[10] = 2199.1</td>
<td>[2536.7]</td>
<td>[8010]</td>
<td>-</td>
</tr>
<tr>
<td>ZSW1.11</td>
<td>1 = I, M, or P limit not reached</td>
<td>p2080[11] = 1407.7</td>
<td>[2522.7]</td>
<td>[5610]</td>
<td>✓</td>
</tr>
<tr>
<td>ZSW1.12</td>
<td>1 = Open holding brake</td>
<td>p2080[12] = 0899.12</td>
<td>[2503.7]</td>
<td>[2701]</td>
<td>-</td>
</tr>
<tr>
<td>ZSW1.13</td>
<td>1 = No motor overtemperature alarm</td>
<td>p2080[13] = 2135.14</td>
<td>[2548.7]</td>
<td>[8016]</td>
<td>✓</td>
</tr>
<tr>
<td>ZSW1.14</td>
<td>1 = Motor rotates forwards (n_act &gt; 0)</td>
<td>p2080[14] = 2197.3</td>
<td>[2534.7]</td>
<td>[8010]</td>
<td>-</td>
</tr>
<tr>
<td>ZSW1.15</td>
<td>1 = No alarm, thermal overload, power unit</td>
<td>p2080[15] = 2135.15</td>
<td>[2548.7]</td>
<td>[8014]</td>
<td>✓</td>
</tr>
</tbody>
</table>

<1> Used in telegrams 1, 2, 3, 4, 7, 9, 110, 111.

<2> The ZSW1 is generated using the binector-connector converter (BI: p2080[0...15], inversion: p2080[0...p2088[0].15)

<3> The drive object is ready to accept data.
Signal sources for ZSW1 in Interface Mode SIMODRIVE 611 universal (p2038 = 1)

<table>
<thead>
<tr>
<th>Signal</th>
<th>Meaning</th>
<th>Interconnection parameters</th>
<th>[Function diagram] internal status word</th>
<th>[Function diagram] Signal source</th>
<th>Inverted</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZSW1.0</td>
<td>1 = Ready to power-up</td>
<td>p2080[0] = r0899.0</td>
<td>[2503.7]</td>
<td>[2610]</td>
<td>-</td>
</tr>
<tr>
<td>ZSW1.1</td>
<td>1 = Ready to operate</td>
<td>p2080[1] = r0899.1</td>
<td>[2503.7]</td>
<td>[2610]</td>
<td>-</td>
</tr>
<tr>
<td>ZSW1.2</td>
<td>1 = Operation enabled</td>
<td>p2080[2] = r0899.2</td>
<td>[2503.7]</td>
<td>[2610]</td>
<td>-</td>
</tr>
<tr>
<td>ZSW1.3</td>
<td>1 = Fault present</td>
<td>p2080[3] = r2139.3</td>
<td>[2548.7]</td>
<td>[8060]</td>
<td>-</td>
</tr>
<tr>
<td>ZSW1.4</td>
<td>1 = No coast down active</td>
<td>p2080[4] = r0899.4</td>
<td>[2503.7]</td>
<td>[2610]</td>
<td>-</td>
</tr>
<tr>
<td>ZSW1.5</td>
<td>1 = No fast stop active</td>
<td>p2080[5] = r0899.5</td>
<td>[2503.7]</td>
<td>[2610]</td>
<td>-</td>
</tr>
<tr>
<td>ZSW1.6</td>
<td>1 = Power-on inhibit active</td>
<td>p2080[6] = r0899.6</td>
<td>[2503.7]</td>
<td>[2610]</td>
<td>-</td>
</tr>
<tr>
<td>ZSW1.7</td>
<td>1 = Alarm present</td>
<td>p2080[7] = r2139.7</td>
<td>[2548.7]</td>
<td>[8065]</td>
<td>-</td>
</tr>
<tr>
<td>ZSW1.8</td>
<td>1 = Speed setpoint - actual value deviation within tolerance t_off</td>
<td>p2080[8] = r2197.7</td>
<td>[2534.7]</td>
<td>[8010]</td>
<td>-</td>
</tr>
<tr>
<td>ZSW1.9</td>
<td>1 = Control requested</td>
<td>p2080[9] = r0899.9</td>
<td>[2503.7]</td>
<td>[2503]</td>
<td>-</td>
</tr>
<tr>
<td>ZSW1.10</td>
<td>1 = for n comparison value reached/exceeded</td>
<td>p2080[10] = r2199.1</td>
<td>[2536.7]</td>
<td>[8010]</td>
<td>-</td>
</tr>
<tr>
<td>ZSW1.11</td>
<td>1 = Alarm class bit 0</td>
<td>p2080[11] = r2139.11</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>ZSW1.12</td>
<td>1 = Alarm class bit 1</td>
<td>p2080[12] = r2139.12</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>ZSW1.13</td>
<td>Reserved</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>ZSW1.14</td>
<td>1 = Closed-loop torque control active</td>
<td>p2080[14] = r1407.2</td>
<td>[2522.7]</td>
<td>[2522]</td>
<td>-</td>
</tr>
<tr>
<td>ZSW1.15</td>
<td>Reserved</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

<1> Used in telegrams 1, 2, 3, 4, 102, 103.
<2> The drive object is ready to accept data.

Signal sources for ZSW1 in Interface SIMODRIVE 611 universal (p2038 = 1)

<table>
<thead>
<tr>
<th>Signal</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZSW1.0</td>
<td>1 = Ready to power-up</td>
</tr>
<tr>
<td>ZSW1.1</td>
<td>1 = Ready to operate</td>
</tr>
<tr>
<td>ZSW1.2</td>
<td>1 = Operation enabled</td>
</tr>
<tr>
<td>ZSW1.3</td>
<td>1 = Fault present</td>
</tr>
<tr>
<td>ZSW1.4</td>
<td>1 = No coast down active</td>
</tr>
<tr>
<td>ZSW1.5</td>
<td>1 = No fast stop active</td>
</tr>
<tr>
<td>ZSW1.6</td>
<td>1 = Power-on inhibit active</td>
</tr>
<tr>
<td>ZSW1.7</td>
<td>1 = Alarm present</td>
</tr>
<tr>
<td>ZSW1.8</td>
<td>1 = Speed setpoint - actual value deviation within tolerance t_off</td>
</tr>
<tr>
<td>ZSW1.9</td>
<td>1 = Control requested</td>
</tr>
<tr>
<td>ZSW1.10</td>
<td>1 = for n comparison value reached/exceeded</td>
</tr>
<tr>
<td>ZSW1.11</td>
<td>1 = Alarm class bit 0</td>
</tr>
<tr>
<td>ZSW1.12</td>
<td>1 = Alarm class bit 1</td>
</tr>
<tr>
<td>ZSW1.13</td>
<td>Reserved</td>
</tr>
<tr>
<td>ZSW1.14</td>
<td>1 = Closed-loop torque control active</td>
</tr>
<tr>
<td>ZSW1.15</td>
<td>Reserved</td>
</tr>
</tbody>
</table>

<1> Used in telegrams 1, 2, 3, 4, 102, 103.
<2> The drive object is ready to accept data.
### Signal sources for ZSW2 in Interface Mode SINAMICS (p2038 = 0)

<table>
<thead>
<tr>
<th>Signal</th>
<th>Meaning</th>
<th>Interconnection parameters</th>
<th>[Function diagram] internal status word</th>
<th>[Function diagram] signal source</th>
<th>Inverted</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZSW2.0</td>
<td>1 = Drive data set DDS effective, bit 0</td>
<td>p2081[0] = r0051.0</td>
<td>-</td>
<td>[8565]</td>
<td>-</td>
</tr>
<tr>
<td>ZSW2.1</td>
<td>Reserved</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>ZSW2.2</td>
<td>Reserved</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>ZSW2.3</td>
<td>Reserved</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>ZSW2.4</td>
<td>Reserved</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>ZSW2.5</td>
<td>1 = Alarm class bit 0</td>
<td>p2081[5] = r2139.11</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>ZSW2.6</td>
<td>1 = Alarm class bit 1</td>
<td>p2081[6] = r2139.12</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>ZSW2.7</td>
<td>1 = Parking axis active</td>
<td>p2081[7] = r0896.0</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>ZSW2.8</td>
<td>1 = Traverse to fixed endstop</td>
<td>p2081[8] = r1406.8</td>
<td>-</td>
<td>[2520]</td>
<td>-</td>
</tr>
<tr>
<td>ZSW2.9</td>
<td>Reserved</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>ZSW2.10</td>
<td>1 = Pulses enabled</td>
<td>p2082[13] = r0899.11</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>ZSW2.11</td>
<td>1 = Motor data set changeover active</td>
<td>p2081[11] = r0895.0</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>ZSW2.12</td>
<td>Slave sign-of-life bit 0</td>
<td>Implicitly interconnected</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>ZSW2.13</td>
<td>Slave sign-of-life bit 1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>ZSW2.14</td>
<td>Slave sign-of-life bit 2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>ZSW2.15</td>
<td>Slave sign-of-life bit 3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

- **1>** Used in telegrams 2, 3, 4, 7, 110, 111.
- **2>** These signals are automatically interconnected for clock-cycle synchronous operation.
## Signal sources for ZSW2 in Interface Mode SIMODRIVE 611 universal (p2038 = 1)

<table>
<thead>
<tr>
<th>Signal</th>
<th>Meaning</th>
<th>Interconnection parameters</th>
<th>[Function diagram] Internal status word</th>
<th>[Function diagram] Signal source</th>
<th>Inverted</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZSW2.0</td>
<td>1 = Drive data DDS effective, bit 0</td>
<td>p2081[0] = r0051.0</td>
<td>-</td>
<td>[8565]</td>
<td>-</td>
</tr>
<tr>
<td>ZSW2.1</td>
<td>Reserved</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>ZSW2.2</td>
<td>Reserved</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>ZSW2.3</td>
<td>Reserved</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>ZSW2.4</td>
<td>1 = Ramp-function generator inactive</td>
<td>p2081[4] = r1199.2</td>
<td>-</td>
<td>[3060] [3080]</td>
<td>✓</td>
</tr>
<tr>
<td>ZSW2.5</td>
<td>1 = Holding brake open</td>
<td>p2081[5] = r0899.12</td>
<td>[2503.7]</td>
<td>[2701]</td>
<td>-</td>
</tr>
<tr>
<td>ZSW2.6</td>
<td>1 = Integrator inhibit, speed controller</td>
<td>p2081[6] = r2093.6</td>
<td>-</td>
<td>[5040] [5210]</td>
<td>-</td>
</tr>
<tr>
<td>ZSW2.7</td>
<td>1 = Parking axis active</td>
<td>p2081[7] = r0893.6</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>ZSW2.8</td>
<td>1 = Traverse to fixed endstop</td>
<td>p2081[8] = r1406.8</td>
<td>-</td>
<td>[2520]</td>
<td>-</td>
</tr>
<tr>
<td>ZSW2.9</td>
<td>Reserved</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>ZSW2.10</td>
<td>Reserved</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>ZSW2.11</td>
<td>1 = Data set changeover active</td>
<td>p2081[11] = r0835.0</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>ZSW2.12</td>
<td>Slave sign-of-life bit 0</td>
<td></td>
<td>Implicitally interconnected</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>ZSW2.13</td>
<td>Slave sign-of-life bit 1</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>ZSW2.14</td>
<td>Slave sign-of-life bit 2</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>ZSW2.15</td>
<td>Slave sign-of-life bit 3</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

<1> Used in telegrams 2, 3, 4, 102, 103.
<2> Only if the function module "extended setpoint channel" is active (r0108.8 = 1).
<3> Only if the function module "extended setpoint channel" is active (r0108.8 = 1).
<4> The ZSW1 is generated using the binector-connector converter (BI: p2080[0...15], inversion: p2088[0].0...p2088[0].15)
**Signal sources for MELDW**

<table>
<thead>
<tr>
<th>Signal</th>
<th>Meaning</th>
<th>Interconnection parameters</th>
<th>[Function diagram] Internal status word</th>
<th>[Function diagram] signal source</th>
<th>Inverted</th>
</tr>
</thead>
<tbody>
<tr>
<td>MELDW.0</td>
<td>1 = Ramp-up/ramp-down completed</td>
<td>p2082[0] = r2199.5</td>
<td>[2537.7]</td>
<td>[8010]</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>0 = Ramp-function generator active</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MELDW.1</td>
<td>1 = Torque utilization [%] &lt; torque threshold value 2 (p2194)</td>
<td>p2082[1] = r2199.11</td>
<td>[2537.7]</td>
<td>[8012]</td>
<td>-</td>
</tr>
<tr>
<td>MELDW.2</td>
<td>1 =</td>
<td>n_act</td>
<td>&lt; speed threshold value 3 (p2161)</td>
<td>p2082[2] = r2199.0</td>
<td>[2537.7]</td>
</tr>
<tr>
<td>MELDW.3</td>
<td>1 =</td>
<td>n_act</td>
<td>&lt; speed threshold value 2 (p2155)</td>
<td>p2082[3] = r2197.1</td>
<td>[2534.7]</td>
</tr>
<tr>
<td>MELDW.4</td>
<td>1 = Vdc_min controller activ (Vdc &lt; p1248)</td>
<td>p2082[4] = r0056.15</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>MELDW.5</td>
<td>Variable signaling function</td>
<td>p2082[5] = r3294</td>
<td>-</td>
<td>[5301]</td>
<td></td>
</tr>
<tr>
<td>MELDW.6</td>
<td>1 = No motor overtemperature alarm</td>
<td>p2082[6] = r2135.14</td>
<td>[2548.7]</td>
<td>[8016]</td>
<td>√</td>
</tr>
<tr>
<td>MELDW.7</td>
<td>1 = No alarm, thermal overload, power unit</td>
<td>p2082[7] = r2135.15</td>
<td>[2548.7]</td>
<td>[8014]</td>
<td>√</td>
</tr>
<tr>
<td>MELDW.8</td>
<td>1 = Speed setpoint - actual value deviation within tolerance t_on</td>
<td>p2082[8] = r2199.4</td>
<td>[2537.7]</td>
<td>[8010]</td>
<td>-</td>
</tr>
<tr>
<td>MELDW.9</td>
<td>Reserved</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MELDW.10</td>
<td>Reserved</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MELDW.11</td>
<td>1 = Controller enable</td>
<td>p2082[11] = r0899.8</td>
<td>[2503.7]</td>
<td>[2610]</td>
<td>-</td>
</tr>
<tr>
<td>MELDW.12</td>
<td>1 = Drive ready</td>
<td>p2082[12] = r0899.7</td>
<td>[2503.7]</td>
<td>[2610]</td>
<td>-</td>
</tr>
<tr>
<td>MELDW.13</td>
<td>1 = Pulses enabled</td>
<td>p2082[13] = r0899.11</td>
<td>[2503.7]</td>
<td>[2610]</td>
<td>-</td>
</tr>
<tr>
<td>MELDW.14</td>
<td>Reserved</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MELDW.15</td>
<td>Reserved</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<1> Used in telegrams 102, 103, 110 and 111.
<2> The status word is generated using the binector-connector converter p2082[2].
Fig. 2-38 2462 – PosSTW-Pos control word interconnection (r0108.4 = 1)

Signal targets for POS_STW (positioning mode, r0108.4 = 1)

<table>
<thead>
<tr>
<th>Signal</th>
<th>Meaning</th>
<th>Interconnection parameters</th>
<th>(Function diagram) internal control word</th>
<th>(Function diagram) signal target</th>
<th>Inverted</th>
</tr>
</thead>
</table>
| POS_STW.0 | 1 = Tracking mode active  
0 = No tracking mode active | p2655[0] = r2092.0     | -                                      | [3635]                          | -        |
| POS_STW.1 | 1 = Set home position  
0 = Do not set home position | p2596 = r2092.1     | -                                      | [3612]                          | -        |
| POS_STW.2 | 1 = Reference cam active  
0 = No reference cam active | p2612 = r2092.2     | -                                      | [3612]                          | -        |
| POS_STW.3 | Reserved       | -                           | -                                      | -                               | -        |
| POS_STW.4 | Reserved       | -                           | -                                      | -                               | -        |
| POS_STW.5 | 1 = Jogging, incremental active  
0 = Jogging, velocity active | p2591 = r2092.5     | -                                      | [3610]                          | -        |
| POS_STW.6 | Reserved       | -                           | -                                      | -                               | -        |
| POS_STW.7 | Reserved       | -                           | -                                      | -                               | -        |
| POS_STW.8 | Reserved       | -                           | -                                      | -                               | -        |
| POS_STW.9 | Reserved       | -                           | -                                      | -                               | -        |
| POS_STW.10 | Reserved      | -                           | -                                      | -                               | -        |
| POS_STW.11 | Reserved      | -                           | -                                      | -                               | -        |
| POS_STW.12 | Reserved      | -                           | -                                      | -                               | -        |
| POS_STW.13 | Reserved      | -                           | -                                      | -                               | -        |
| POS_STW.14 | Reserved      | -                           | -                                      | -                               | -        |
| POS_STW.15 | Reserved      | -                           | -                                      | -                               | -        |

<1> Used in telegram 110, 999.
### Signal targets for POS_STW1 (positioning mode, r0108.4 = 1)

<table>
<thead>
<tr>
<th>Signal</th>
<th>Meaning</th>
<th>Interconnection parameters</th>
<th>[Function diagram] internal control word</th>
<th>[Function diagram] signal target</th>
<th>Inverted</th>
</tr>
</thead>
<tbody>
<tr>
<td>POS_STW1.0</td>
<td>Traversing block selection, bit 0</td>
<td>p2625 = r2091.0</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>POS_STW1.1</td>
<td>Traversing block selection, bit 1</td>
<td>p2626 = r2091.1</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>POS_STW1.2</td>
<td>Traversing block selection, bit 2</td>
<td>p2627 = r2091.2</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>POS_STW1.3</td>
<td>Traversing block selection, bit 3</td>
<td>p2628 = r2091.3</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>POS_STW1.4</td>
<td>Traversing block selection, bit 4</td>
<td>p2629 = r2091.4</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>POS_STW1.5</td>
<td>Traversing block selection, bit 5</td>
<td>p2630 = r2091.5</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>POS_STW1.6</td>
<td>Reserved</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>POS_STW1.7</td>
<td>Reserved</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>POS_STW1.8</td>
<td>1 = Absolute positioning is selected. 0 = Relative positioning is selected.</td>
<td>p2648 = r2091.8</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>POS_STW1.9</td>
<td>1 = Absolute positioning/MDI direction selection, positive. 2 = Absolute positioning/MDI direction selection, negative. 3 = Absolute positioning through the shortest distance.</td>
<td>p2651 = r2091.9</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>POS_STW1.10</td>
<td>0 = Absolute positioning through the shortest distance.</td>
<td>p2652 = r2091.10</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>POS_STW1.11</td>
<td>Reserved</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>POS_STW1.12</td>
<td>0 = Activate MDI block change with ( f ) of a traversing task (STW1.6). 1 = Continuous transfer.</td>
<td>p2649 = r2091.12</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>POS_STW1.13</td>
<td>Reserved</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>POS_STW1.14</td>
<td>1 = signal setting-up selected 0 = signal positioning selected.</td>
<td>p2653 = r2091.14</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>POS_STW1.15</td>
<td>1 = MDI selection</td>
<td>p2647 = r2091.15</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

<1> Used in telegram 111.

---

**Notation:**
- **POS_STW1.0** to **POS_STW1.15**: Traversing block selection, bit 0 to bit 15.
- **Reserved**: Fields reserved for future use.
- **Inverted**: Indicates if the signal is inverted or not.
- **Interconnection parameters**: Values used in the function diagram internal control word.
- **Function diagram signal target**: Values used in the function diagram signal target.

---

**Table:**

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DO: SERVO</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>PROFIdrive – POS_STW1-Pos control word 1 interconnection (r0108.4 = 1)</strong></td>
<td>fp_2463_98_eng.vsd</td>
<td>Function diagram</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SINAMICS S110</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**Diagram:**
- **Diagram Description**: Diagram showing the interconnection and signal targets for POS_STW1.
- **Diagram Reference**: Diagram file `fp_2463_98_eng.vsd`.

---

**Note:**
- PROFIdrive Abtastrzeit: Used in telegram 111.
- PROFIdrive Abtastrzeit (Time Taken): Represents the time taken for a particular operation within the PROFIdrive system.
- Signal targets for POS_STW1: Detailed signal targets for different bits within the POS_STW1 signal word.

---

**Additional Information:**
- **Signal Targets**: A comprehensive list of signal targets for various bits within the POS_STW1 signal word.
- **Function Diagrams**: diagrams illustrating the interconnection and signal targets.
- **Interconnection Parameters**: Parameters used in the function diagram internal control word.
- **Signal Targets**: The specific signal targets are listed for each bit, including descriptions such as "Absolute positioning is selected" and "Relative positioning is selected."
## Signal targets for POS_STW2 (positioning mode, r0108.4 = 1)

<table>
<thead>
<tr>
<th>Signal</th>
<th>Meaning</th>
<th>Interconnection parameters</th>
<th>[Function diagram] internal control word</th>
<th>[Function diagram] signal target</th>
<th>Inverted</th>
</tr>
</thead>
<tbody>
<tr>
<td>POS_STW2.0</td>
<td>1 = Tracking mode active</td>
<td>p2655 = r2092.0</td>
<td></td>
<td>[3635]</td>
<td>-</td>
</tr>
<tr>
<td>POS_STW2.1</td>
<td>1 = Set reference point</td>
<td>p2596 = r2092.1</td>
<td></td>
<td>[3612]</td>
<td>-</td>
</tr>
<tr>
<td>POS_STW2.2</td>
<td>1 = Reference cam active</td>
<td>p2612 = r2092.2</td>
<td></td>
<td>[3612]</td>
<td>-</td>
</tr>
<tr>
<td>POS_STW2.3</td>
<td>Reserved</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>POS_STW2.4</td>
<td>Reserved</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>POS_STW2.5</td>
<td>1 = Jogging, incremental active</td>
<td>p2591 = r2092.5</td>
<td></td>
<td>[3610]</td>
<td>-</td>
</tr>
<tr>
<td>POS_STW2.6</td>
<td>Reserved</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>POS_STW2.7</td>
<td>Reserved</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>POS_STW2.8</td>
<td>1 = Referencing type selection for flying referencing</td>
<td>p2597 = r2092.8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>POS_STW2.9</td>
<td>1 = The search for reference in the negative direction</td>
<td>p2604 = r2092.9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>POS_STW2.10</td>
<td>1 = Measuring probe 2 is activated</td>
<td>p2510[0] = r2092.10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>POS_STW2.11</td>
<td>1 = Falling edge of the measuring probe</td>
<td>p2511[0] = r2092.11</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>POS_STW2.12</td>
<td>Reserved</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>POS_STW2.13</td>
<td>Reserved</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>POS_STW2.14</td>
<td>1 = Software limit switch activation</td>
<td>p2582 = r2092.14</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>POS_STW2.15</td>
<td>1 = STOP cam activ</td>
<td>p2568 = r2092.15</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<1> Used in telegram 111.

### Interconnection parameters

- **POS_STW2.0**
  - 1 = Tracking mode active
  - 0 = Tracking mode inactive

- **POS_STW2.1**
  - 1 = Set reference point
  - 0 = Set reference point inactive

- **POS_STW2.2**
  - 1 = Reference cam active
  - 0 = Reference cam inactive

- **POS_STW2.3**
  - Reserved

- **POS_STW2.4**
  - Reserved

- **POS_STW2.5**
  - 1 = Jogging, incremental active
  - 0 = Jogging, velocity active

- **POS_STW2.6**
  - Reserved

- **POS_STW2.7**
  - Reserved

- **POS_STW2.8**
  - 1 = Referencing type selection for flying referencing
  - 0 = Referencing type selection for search for reference

- **POS_STW2.9**
  - 1 = The search for reference in the negative direction
  - 0 = The search for reference in the positive direction

- **POS_STW2.10**
  - 1 = Measuring probe 2 is activated
  - 0 = Measuring probe 2 is not activated

- **POS_STW2.11**
  - 1 = Falling edge of the measuring probe
  - 0 = Rising edge of the measuring probe

- **POS_STW2.12**
  - Reserved

- **POS_STW2.13**
  - Reserved

- **POS_STW2.14**
  - 1 = Software limit switch activation

- **POS_STW2.15**
  - 1 = STOP cam active

---

**Fig. 2-40**

2464 - POS_STW2-POS control word 2 interconnection (r0108.4 = 1)

---

**Function diagram**

- **DO: SERVO**
  - PROFIdrive – POS_STW2-POS control word 2 interconnection (r0108.4 = 1)
  - 08.10.08 V04.04.00
  - SINAMICS S110
### Signal targets for POS_ZSW1 (positioning mode, r0108.4 = 1)

<table>
<thead>
<tr>
<th>Signal</th>
<th>Meaning</th>
<th>Interconnection parameters</th>
<th>Function diagram</th>
<th>Function diagram</th>
<th>Inverted</th>
</tr>
</thead>
<tbody>
<tr>
<td>POS_ZSW1.0</td>
<td>Active Traversing Block Bit 0 (2')</td>
<td>p2083[0] = r2670[0]</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>POS_ZSW1.1</td>
<td>Active Traversing Block Bit 1 (2')</td>
<td>p2083[1] = r2670[1]</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>POS_ZSW1.2</td>
<td>Active Traversing Block Bit 2 (2')</td>
<td>p2083[2] = r2670[2]</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>POS_ZSW1.3</td>
<td>Active Traversing Block Bit 3 (2')</td>
<td>p2083[3] = r2670[3]</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>POS_ZSW1.4</td>
<td>Active Traversing Block Bit 4 (2')</td>
<td>p2083[4] = r2670[4]</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>POS_ZSW1.5</td>
<td>Active Traversing Block Bit 5 (2')</td>
<td>p2083[5] = r2670[5]</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>POS_ZSW1.6</td>
<td>Reserved</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>POS_ZSW1.7</td>
<td>Reserved</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>POS_ZSW1.8</td>
<td>1 = STOP cam minus active</td>
<td>p2083[08] = r2684[13]</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>POS_ZSW1.9</td>
<td>1 = STOP cam plus aktiv</td>
<td>p2083[09] = r2684[14]</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>POS_ZSW1.10</td>
<td>1 = Jogging active</td>
<td>p2083[10] = r2094[0]</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>POS_ZSW1.11</td>
<td>1 = Reference point approach active</td>
<td>p2083[11] = r2094[1]</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>POS_ZSW1.12</td>
<td>1 = Flying referencing active</td>
<td>p2083[12] = r2684[1]</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>POS_ZSW1.13</td>
<td>1 = Traversing Block active</td>
<td>p2083[13] = r2094[2]</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>POS_ZSW1.14</td>
<td>1 = Set-up active</td>
<td>p2083[14] = r2094[4]</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>POS_ZSW1.15</td>
<td>1 = MDI active</td>
<td>p2083[15] = r2670[15]</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>0 = MDI inactive</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

<1> Used in telegram 111.

---

**DO: SERVO**

PROFIdrive – POS_ZSW1-Pos status word 1 interconnection (r0108.4 = 1)
## Signal targets for POS_ZSW2 (positioning mode, r0108.4 = 1)

<table>
<thead>
<tr>
<th>Signal</th>
<th>Meaning</th>
<th>Interconnection parameters</th>
<th>[Function diagram] internal control word</th>
<th>[Function diagram] signal target</th>
<th>Inverted</th>
</tr>
</thead>
<tbody>
<tr>
<td>POS_ZSW2.0</td>
<td>1 = Tracking mode active</td>
<td>p2084[0] = r2683.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>POS_ZSW2.1</td>
<td>1 = Velocity limiting active</td>
<td>p2084[1] = r2683.1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>POS_ZSW2.2</td>
<td>1 = Setpoint available</td>
<td>p2084[2] = r2683.2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>POS_ZSW2.3</td>
<td>1 = Printing mark outside outer window</td>
<td>p2084[3] = r2684.3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>POS_ZSW2.4</td>
<td>1 = Axis moves forward</td>
<td>p2084[4] = r2683.4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>POS_ZSW2.5</td>
<td>1 = Axis moves backwards</td>
<td>p2084[5] = r2683.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>POS_ZSW2.6</td>
<td>1 = Software limit switch minus reached</td>
<td>p2084[6] = r2683.6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>POS_ZSW2.7</td>
<td>1 = Software limit switch plus reached</td>
<td>p2084[7] = r2683.7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>POS_ZSW2.8</td>
<td>1 = Position actual value &lt;= cam switching position 1</td>
<td>p2084[8] = r2683.8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>POS_ZSW2.9</td>
<td>1 = Position actual value &lt;= cam switching position 2</td>
<td>p2084[9] = r2683.9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>POS_ZSW2.10</td>
<td>1 = Direct output 1 via traversing block</td>
<td>p2084[10] = r2683.10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>POS_ZSW2.11</td>
<td>1 = Direct output 2 via traversing block</td>
<td>p2084[11] = r2683.11</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>POS_ZSW2.12</td>
<td>1 = Fixed stop reached</td>
<td>p2084[12] = r2683.12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>POS_ZSW2.13</td>
<td>1 = Fixed stop clamping torque reached</td>
<td>p2084[13] = r2683.13</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>POS_ZSW2.14</td>
<td>1 = Travel to fixed stop active</td>
<td>p2084[14] = r2683.14</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>POS_ZSW2.15</td>
<td>1 = Traversing command active</td>
<td>p2084[15] = r2684.15</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<1> Verwendung in Telegramm 111.
1. In order to maintain the PROFIdrive profile, receive word 1 must be used as control word (STW1) (due to bit 10 “control requested”).
2. Using the connector-binector converters, the bits can be extracted from two of the PZD receive words 5 to 20 and used as binectors.
3. The following representation applies for words: 4000 hex = 100 % for double words. 4000 0000 hex = 100 %.
4. The reference variables p200x apply for the ongoing interconnection (100 % -> p200x).
The reference variables p200x apply for the ongoing interconnection (100 % -> p200x).
5. The connector-binector converter only converts the lower 16 bits irrespective of the input variable.
6. Every PZD word can be assigned a word or a double word. Only one of the 2 interconnection parameters r2050 or r2060 may have a value = 0 for a PZD word.
Fig. 2-44

2470 – IF1 send telegram, free interconnection via BICO (p0922 = 999)

To comply with the PROFIdrive profile, send word 1 must be used as status word 1 (ZSW1), not as DWORD.

Every PZD word can be assigned a word or a double word. Only one of the 2 interconnection parameters p2051 or p2061 may have a value ≠ 0 for a PZD word.

Physical word and double word values are inserted in the telegram as referenced variables. p200x apply as reference variables (telegram contents = 4000 hex or 4000 0000 hex in the case of double words, if the input variable has the value p200x).

The following applies for temperature values: 100°C -> 100% = 4000 hex or 4000 0000 hex; 0°C -> 0 %.

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>DO: SERVO</td>
<td>PROFIdrive - IF1 send telegram, free interconnection via BICO (p0922 = 999)</td>
<td>fp_2470_98_eng.vsd</td>
<td>Function diagram</td>
<td>- 2470 -</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>04.04.12</td>
<td>V04.04.00</td>
<td>SINAMICS S110</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5 binector-connector converter

For clock-cycle synchronous SERVO, these signals must not be interconnected (slave sign-of-life).
<table>
<thead>
<tr>
<th>Signal</th>
<th>Meaning</th>
<th>Interconnection parameters</th>
<th>Function diagram signal target</th>
<th>Inverted</th>
</tr>
</thead>
<tbody>
<tr>
<td>STW1.0</td>
<td>ON (pulses can be enabled)</td>
<td>p0840[0] = r2090.0</td>
<td>[2501.3]</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>0 = OFF1 (braking with ramp-funct. generator, then pulse cancellation and ready-to-power-up)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>STW1.1</td>
<td>1 = No OFF2 (enable is possible)</td>
<td>p0844[0] = r2090.1</td>
<td>[2501.3]</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>0 = OFF2 (immediate pulse cancellation and power-on inhibit)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>STW1.2</td>
<td>1 = No OFF3 (enable possible)</td>
<td>p0848[0] = r2090.2</td>
<td>[2501.3]</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>0 = OFF3 (braking with the OFF3 ramp p1135, then pulse cancellation and power-on inhibit)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>STW1.3</td>
<td>1 = Enable operation (pulses can be enabled)</td>
<td>p0852[0] = r2090.3</td>
<td>[2501.3]</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>0 = Inhibit operation (cancel pulses)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>STW1.4</td>
<td>1 = Do not reject traversing task</td>
<td>p2641 = r2090.4</td>
<td>[3625]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0 = Reject traversing task (ramp-down with the maximum deceleration)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>STW1.5</td>
<td>1 = No intermediate stop</td>
<td>p2640 = r2090.5</td>
<td>[3625]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0 = Intermediate stop</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>STW1.6</td>
<td>1 = Activate traversing task</td>
<td>p2631 = r2090.6</td>
<td>[3625]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0 = Stop traversing task</td>
<td>p2650 = r2090.6</td>
<td>[3625]</td>
<td></td>
</tr>
<tr>
<td>STW1.7</td>
<td>1 = Acknowledge faults</td>
<td>p2103[0] = r2090.7</td>
<td>[2501.3]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0 = Stop acknowledgments</td>
<td></td>
<td>[2501.3]</td>
<td></td>
</tr>
<tr>
<td>STW1.8</td>
<td>1 = Jog 1 signal source</td>
<td>p2589 = r2090.8</td>
<td>[3625]</td>
<td></td>
</tr>
<tr>
<td>STW1.9</td>
<td>1 = Jog 2 signal source</td>
<td>p2590 = r2090.9</td>
<td>[3625]</td>
<td></td>
</tr>
<tr>
<td>STW1.10</td>
<td>1 = Control via PLC</td>
<td>p0854[0] = r2090.10</td>
<td>[2501.3]</td>
<td></td>
</tr>
<tr>
<td>STW1.11</td>
<td>1 = Start homing</td>
<td>p2595 = r2090.11</td>
<td>[3625]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0 = Stop homing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>STW1.12</td>
<td>Reserved</td>
<td>-</td>
<td>[3625]</td>
<td></td>
</tr>
<tr>
<td>STW1.13</td>
<td>1 = External block change</td>
<td>p2633 = r2090.13</td>
<td>[3625]</td>
<td></td>
</tr>
<tr>
<td>STW1.14</td>
<td>Reserved</td>
<td>-</td>
<td>[3625]</td>
<td></td>
</tr>
<tr>
<td>STW1.15</td>
<td>Reserved</td>
<td>-</td>
<td>[3625]</td>
<td></td>
</tr>
</tbody>
</table>

<1> Used in telegrams 7, 9, 110, 111.
<2> STW1.10 must be set to ensure that the drive object accepts the process data (PZD).
<3> The interconnection p2649 = 0 is made additionally only in Telegram 7,9 and 110.
### Signal targets for SATZANW (positioning mode, r0108.4 = 1)

<table>
<thead>
<tr>
<th>Signal</th>
<th>Meaning</th>
<th>Interconnection parameters</th>
<th>[Function diagram] internal control word</th>
<th>[Function diagram] signal target</th>
<th>Inverted</th>
</tr>
</thead>
<tbody>
<tr>
<td>SATZANW.0</td>
<td>1 = Traversing block selection, bit 0</td>
<td>p2625 = r2091.0</td>
<td></td>
<td>[3640]</td>
<td></td>
</tr>
<tr>
<td>SATZANW.1</td>
<td>1 = Traversing block selection, bit 1</td>
<td>p2626 = r2091.1</td>
<td></td>
<td>[3640]</td>
<td></td>
</tr>
<tr>
<td>SATZANW.2</td>
<td>1 = Traversing block selection, bit 2</td>
<td>p2627 = r2091.2</td>
<td></td>
<td>[3640]</td>
<td></td>
</tr>
<tr>
<td>SATZANW.3</td>
<td>1 = Traversing block selection, bit 3</td>
<td>p2628 = r2091.3</td>
<td></td>
<td>[3640]</td>
<td></td>
</tr>
<tr>
<td>SATZANW.4</td>
<td>1 = Traversing block selection, bit 4</td>
<td>p2629 = r2091.4</td>
<td></td>
<td>[3640]</td>
<td></td>
</tr>
<tr>
<td>SATZANW.5</td>
<td>1 = Traversing block selection, bit 5</td>
<td>p2630 = r2091.5</td>
<td></td>
<td>[3640]</td>
<td></td>
</tr>
<tr>
<td>SATZANW.6</td>
<td>Reserved</td>
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<tr>
<td>SATZANW.7</td>
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<tr>
<td>SATZANW.8</td>
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<tr>
<td>SATZANW.9</td>
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<td>SATZANW.10</td>
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<td>SATZANW.11</td>
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<td>SATZANW.12</td>
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<tr>
<td>SATZANW.13</td>
<td>Reserved</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SATZANW.14</td>
<td>Reserved</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SATZANW.15</td>
<td>1 = Activate MDI</td>
<td>p2647 = r2091.15</td>
<td></td>
<td>[3625]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0 = Deactivate MDI</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<1> Used in telegrams 7, 9 und 110.

---

**DO: SERVO**

**PROFIdrive - SATZANW Pos Block Selection interconnection (r0108.4 = 1)**

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## Signal sources for ZSW1 (positioning mode, r0108.4 = 1)

<table>
<thead>
<tr>
<th>Signal</th>
<th>Meaning</th>
<th>Interconnection parameters</th>
<th>[Function diagram] Internal status word</th>
<th>[Function diagram] signal source</th>
<th>Inverted</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZSW1.0</td>
<td>1 = Ready to power-up</td>
<td>p2080[0] = r0899.0</td>
<td>[2503.7]</td>
<td>[2610]</td>
<td></td>
</tr>
<tr>
<td>ZSW1.1</td>
<td>1 = Ready to operate (DC link loaded, pulses blocked)</td>
<td>p2080[1] = r0899.1</td>
<td>[2503.7]</td>
<td>[2610]</td>
<td></td>
</tr>
<tr>
<td>ZSW1.2</td>
<td>1 = Operation enabled (drive follows n_set)</td>
<td>p2080[2] = r0899.2</td>
<td>[2503.7]</td>
<td>[2610]</td>
<td></td>
</tr>
<tr>
<td>ZSW1.3</td>
<td>1 = Fault present</td>
<td>p2080[3] = r2139.3</td>
<td>[2548.7]</td>
<td>[8060]</td>
<td></td>
</tr>
<tr>
<td>ZSW1.4</td>
<td>1 = No coast down active (OFF2 inactive)</td>
<td>p2080[4] = r0899.4</td>
<td>[2503.7]</td>
<td>[2610]</td>
<td></td>
</tr>
<tr>
<td>ZSW1.5</td>
<td>1 = No fast stop active (OFF3 inactive)</td>
<td>p2080[5] = r0899.5</td>
<td>[2503.7]</td>
<td>[2610]</td>
<td></td>
</tr>
<tr>
<td>ZSW1.6</td>
<td>1 = Power-on inhibit active</td>
<td>p2080[6] = r0899.6</td>
<td>[2503.7]</td>
<td>[2610]</td>
<td></td>
</tr>
<tr>
<td>ZSW1.7</td>
<td>1 = Alarm present</td>
<td>p2080[7] = r2139.7</td>
<td>[2548.7]</td>
<td>[8065]</td>
<td></td>
</tr>
<tr>
<td>ZSW1.8</td>
<td>1 = Following error within tolerance</td>
<td>p2080[8] = r2684.8</td>
<td>[3646.7]</td>
<td>[4025]</td>
<td></td>
</tr>
<tr>
<td>ZSW1.9</td>
<td>1 = Control requested</td>
<td>p2080[9] = r0899.9</td>
<td>[2503.7]</td>
<td>[2503]</td>
<td></td>
</tr>
<tr>
<td>ZSW1.10</td>
<td>1 = Target position reached</td>
<td>p2080[10] = r2684.10</td>
<td>[3646.7]</td>
<td>[4020] [3625]</td>
<td></td>
</tr>
<tr>
<td>ZSW1.11</td>
<td>1 = Home position set</td>
<td>p2080[11] = r2684.11</td>
<td>[3646.7]</td>
<td>[3612] [3614]</td>
<td></td>
</tr>
<tr>
<td>ZSW1.12</td>
<td>= Acknowledgement traversing block activated</td>
<td>p2080[12] = r2684.12</td>
<td>[3646.7]</td>
<td>[3616] [3620]</td>
<td></td>
</tr>
<tr>
<td>ZSW1.13</td>
<td>1 =</td>
<td>n_act</td>
<td>&lt; speed threshold value 3</td>
<td>p2080[13] = r2199.0</td>
<td>[2537.7]</td>
</tr>
<tr>
<td>ZSW1.14</td>
<td>1 = Axis accelerated</td>
<td>p2080[14] = r2684.4</td>
<td>[3646.7]</td>
<td>[3635]</td>
<td></td>
</tr>
<tr>
<td>ZSW1.15</td>
<td>1 = Axis decelerated</td>
<td>p2080[15] = r2684.5</td>
<td>[3646.7]</td>
<td>[3635]</td>
<td></td>
</tr>
</tbody>
</table>

<1> Used in telegrams 7, 9, 110, 111.

<2> p2080[2] = r0899.2
p2080[3] = r2139.3
p2080[4] = r0899.4
p2080[5] = r0899.5
p2080[6] = r0899.6
p2080[7] = r2139.7
p2080[8] = r2684.8
p2080[9] = r0899.9
p2080[10] = r2684.10
p2080[12] = r2684.12
p2080[13] = r2199.0
p2080[14] = r2684.4
p2080[15] = r2684.5

<3> p2080[0] = r0899.0
p2080[1] = r0899.1
p2080[2] = r0899.2
p2080[3] = r2139.3
p2080[4] = r0899.4
p2080[5] = r0899.5
p2080[6] = r0899.6
p2080[7] = r2139.7
p2080[8] = r2684.8
p2080[9] = r0899.9
p2080[10] = r2684.10
p2080[12] = r2684.12
p2080[13] = r2199.0
p2080[14] = r2684.4
p2080[15] = r2684.5

<3> The drive object is ready to accept data.

<3> Only for telegram 111.

---

![Function diagram](fp_2479_98_eng.vsd)

**Fig. 2-48** 2479 – ZSW1-Status Word 1 interconnection (r0108.4 = 1)
### Signal targets for MDI_MOD (positioning mode, r0108.4 = 1)

<table>
<thead>
<tr>
<th>Signal</th>
<th>Meaning</th>
<th>Interconnection parameters</th>
<th>[Function diagram] internal control word</th>
<th>[Function diagram] signal target</th>
<th>Inverted</th>
</tr>
</thead>
<tbody>
<tr>
<td>MDI_MOD.0</td>
<td>1 = Absolute positioning is selected 0 = Relative positioning is selected</td>
<td>p2648 = r2094.0</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>MDI_MOD.1</td>
<td>0 = Absolute positioning through the shortest distance 1 = Absolute positioning in the positive direction 2 = Absolute positioning in the negative direction 3 = Absolute positioning through the shortest distance</td>
<td>p2651 = r2094.1</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>MDI_MOD.2</td>
<td></td>
<td>p2652 = r2094.2</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>MDI_MOD.3</td>
<td>Reserved</td>
<td>-</td>
<td>-</td>
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<td>-</td>
</tr>
<tr>
<td>MDI_MOD.4</td>
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<td>-</td>
<td>-</td>
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</tr>
<tr>
<td>MDI_MOD.5</td>
<td>Reserved</td>
<td>-</td>
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</tr>
<tr>
<td>MDI_MOD.6</td>
<td>Reserved</td>
<td>-</td>
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<tr>
<td>MDI_MOD.7</td>
<td>Reserved</td>
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<td>MDI_MOD.8</td>
<td>Reserved</td>
<td>-</td>
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</tr>
<tr>
<td>MDI_MOD.9</td>
<td>Reserved</td>
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</tr>
<tr>
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</tr>
<tr>
<td>MDI_MOD.11</td>
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<td>-</td>
<td>-</td>
<td>-</td>
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</tr>
<tr>
<td>MDI_MOD.12</td>
<td>Reserved</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>MDI_MOD.13</td>
<td>Reserved</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>MDI_MOD.14</td>
<td>Reserved</td>
<td>-</td>
<td>-</td>
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<td>-</td>
</tr>
<tr>
<td>MDI_MOD.15</td>
<td>Reserved</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

<1> Used in telegram 9.
**PROFIdrive - IF1 receive telegram, free interconnection via BICO (p0922 = 999)**

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>DO: CU_S110</td>
<td>fp_2481_98_eng.vsd</td>
<td>Function diagram</td>
<td>- 2481 -</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**PROFIdrive sampling time**

Refer to [1020.7]

<1> The following representation applies for words: 4000 hex = 100 %.

The reference variables p200x apply for the ongoing interconnection (100 % -> p200x).
The following applies for temperature values: 100 °C -> 100 % = 4000 hex; 0 °C -> 0 %.

PROFIBUS

PROFINET

PROFIdrive receive telegram

Header

Drive object 1

Drive object 2

... 

Drive object n

... 

Drive object m

Trailer

Reference quantities for further interconnection p200x

<1>

fp_2481_98_eng.vsd

16.11.08 V04.04.00

SINAMICS S110

Fig. 2-50 2481 – IF1 receive telegram, free interconnection via BICO (p0922 = 999)
Fig. 2-51 2483 – IF1 send telegram, free interconnection via BICO (p0922 = 999)

Reference quantities for further interconnection
p200x

<1> Using the binector/connector converters at [2472], bits of 4 send words can be interconnected with any binectors.

<2> The following representation applies for words: 4000 hex = 100 %.

The reference variables p200x apply for the ongoing interconnection (100 % -> p200x).

The following applies for temperature values: 100 °C -> 100 % = 4000 hex; 0 °C -> 0 %.

Refer to [1020.7] PROFIdrive Abtastzeit
### Signal targets for CU_STW1

<table>
<thead>
<tr>
<th>Signal</th>
<th>Meaning</th>
<th>Interconnection parameters</th>
<th>[Function diagram] internal control word</th>
<th>[Function diagram] signal target</th>
<th>Inverted</th>
</tr>
</thead>
<tbody>
<tr>
<td>CU_STW.0</td>
<td>Central measuring probe, synchronizing signal source</td>
<td>p0681[0] = r2090.0</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>CU_STW.1</td>
<td>RTC real time synchronization PING</td>
<td>p3104 = r2090.1</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>CU_STW.2</td>
<td>Reserved</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>CU_STW.3</td>
<td>Reserved</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>CU_STW.4</td>
<td>Reserved</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>CU_STW.5</td>
<td>Reserved</td>
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<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>CU_STW.6</td>
<td>Reserved</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>CU_STW.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>( i = 1. ) Acknowledge faults</td>
<td>p2103[0] = r2090.7</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>CU_STW.8</td>
<td>Reserved</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>CU_STW.9</td>
<td>Reserved</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>CU_STW.10</td>
<td>Master control by PLC</td>
<td>p3116 = r2090.10</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>CU_STW.11</td>
<td>Reserved</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>CU_STW.12</td>
<td>Master sign-of-life bit 0</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>CU_STW.13</td>
<td>Master sign-of-life bit 1</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>CU_STW.14</td>
<td>Master sign-of-life bit 2</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>CU_STW.15</td>
<td>Master sign-of-life bit 3</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

\(<1>\) Used in telegrams 390 and 391.

---

**Signal targets for CU_STW1**

**fig. 2-52** 2495 - CU_STW control word, Control Unit interconnection

**Function diagrams**

**DO: CU_S110**

PROFIdrive - CU_STW1 control word Control Unit interconnection

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SINAMICS S110 List Manual (LU7), 06/2012, 6SL3097-4AP10-0BP3

<1> Refer to [1020.7]
### Signal sources for CU_ZSW1

<table>
<thead>
<tr>
<th>Signal</th>
<th>Meaning</th>
<th>Interconnection parameters</th>
<th>(Function diagram) internal status word</th>
<th>(Function diagram) signal source</th>
<th>Inverted</th>
</tr>
</thead>
<tbody>
<tr>
<td>CU_ZSW1.0</td>
<td>Reserved</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CU_ZSW1.1</td>
<td>Reserved</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CU_ZSW1.2</td>
<td>Reserved</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CU_ZSW1.3</td>
<td>1 = Fault present</td>
<td>p2081[3] = r2139.3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CU_ZSW1.4</td>
<td>Reserved</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CU_ZSW1.5</td>
<td>Reserved</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CU_ZSW1.6</td>
<td>Reserved</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CU_ZSW1.7</td>
<td>1 = Alarm present</td>
<td>p2081[7] = r2139.7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CU_ZSW1.8</td>
<td>1 = System time synchronized</td>
<td>p2081[8] = r0899.8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CU_ZSW1.9</td>
<td>1 = Alarm is not present</td>
<td>p2081[9] = r3114.9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CU_ZSW1.10</td>
<td>1 = Fault not present</td>
<td>p2081[10] = r3114.10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CU_ZSW1.12</td>
<td>Slave sign-of-life bit 0</td>
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<tr>
<td>CU_ZSW1.13</td>
<td>Slave sign-of-life bit 1</td>
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<tr>
<td>CU_ZSW1.14</td>
<td>Slave sign-of-life bit 2</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>CU_ZSW1.15</td>
<td>Slave sign-of-life bit 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<1> Used in telegrams 390 and 391.
<2> The ZSW1 is generated using the binector-connector converter (Bl: p[208][0...15], inversion: p[208][0..p2088][0..15]).
## Signal targets for A_DIGITAL

<table>
<thead>
<tr>
<th>Signal</th>
<th>Meaning</th>
<th>Interconnection parameters</th>
<th>Function diagram internal status word</th>
<th>Function diagram signal target</th>
<th>Inverted</th>
</tr>
</thead>
<tbody>
<tr>
<td>A_DIGITAL.0</td>
<td>Digital output 8 (DI/DO 8)</td>
<td>p0738[0] = r2091.0</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>A_DIGITAL.1</td>
<td>Digital output 9 (DI/DO 9)</td>
<td>p0739[0] = r2091.1</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>A_DIGITAL.2</td>
<td>Digital output 10 (DI/DO 10)</td>
<td>p0740[0] = r2091.2</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>A_DIGITAL.3</td>
<td>Digital output 11 (DI/DO 11)</td>
<td>p0741[0] = r2091.3</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>A_DIGITAL.4</td>
<td>Reserved</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>A_DIGITAL.5</td>
<td>Reserved</td>
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<tr>
<td>A_DIGITAL.6</td>
<td>Reserved</td>
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</tr>
<tr>
<td>A_DIGITAL.7</td>
<td>Reserved</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>A_DIGITAL.8</td>
<td>Digital output 16 (DO 16)</td>
<td>p0746[0] = r2091.8</td>
<td>-</td>
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<td>-</td>
</tr>
<tr>
<td>A_DIGITAL.9</td>
<td>Reserved</td>
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<tr>
<td>A_DIGITAL.10</td>
<td>Reserved</td>
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<tr>
<td>A_DIGITAL.11</td>
<td>Reserved</td>
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<td>A_DIGITAL.15</td>
<td>Reserved</td>
<td></td>
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</tr>
</tbody>
</table>

- <1> Used in telegrams 390, 391, 392, 393 and 394.
- <2> Can be set via p0728 as input (DI) or output (DO).
- <3> Pre-assignment, can be freely changed.
- <4> For restrictions, refer to p0746.
### Signal targets for E_DIGITAL

<table>
<thead>
<tr>
<th>Signal</th>
<th>Meaning</th>
<th>Interconnection parameters</th>
<th>[Function diagram: Internal status word]</th>
<th>[Function diagram: signal target]</th>
<th>Inverted</th>
</tr>
</thead>
<tbody>
<tr>
<td>E_DIGITAL.0</td>
<td>Digital input 8 (DI/DO 8)</td>
<td>p2082[0] = r0722.8</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>E_DIGITAL.1</td>
<td>Digital input 9 (DI/DO 9)</td>
<td>p2082[1] = r0722.9</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>E_DIGITAL.2</td>
<td>Digital input 10 (DI/DO 10)</td>
<td>p2082[2] = r0722.10</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>E_DIGITAL.3</td>
<td>Digital input 11 (DI/DO 11)</td>
<td>p2082[3] = r0722.11</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>E_DIGITAL.4</td>
<td>Reserved</td>
<td></td>
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</tr>
<tr>
<td>E_DIGITAL.5</td>
<td>Reserved</td>
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</tr>
<tr>
<td>E_DIGITAL.6</td>
<td>Reserved</td>
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<td>-</td>
<td>-</td>
</tr>
<tr>
<td>E_DIGITAL.7</td>
<td>Reserved</td>
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<td></td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>E_DIGITAL.8</td>
<td>Digital input 0 (DI 0)</td>
<td>p2082[8] = r0722.0</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>E_DIGITAL.9</td>
<td>Digital input 1 (DI 1)</td>
<td>p2082[9] = r0722.1</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>E_DIGITAL.10</td>
<td>Digital input 2 (DI 2)</td>
<td>p2082[10] = r0722.2</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>E_DIGITAL.11</td>
<td>Digital input 3 (DI 3)</td>
<td>p2082[11] = r0722.3</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>E_DIGITAL.12</td>
<td>Reserved</td>
<td></td>
<td></td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>E_DIGITAL.13</td>
<td>Reserved</td>
<td></td>
<td></td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>E_DIGITAL.14</td>
<td>Reserved</td>
<td></td>
<td></td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>E_DIGITAL.15</td>
<td>Reserved</td>
<td></td>
<td></td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**<1>** Used in telegrams 390, 391, 392, 393 and 394.

**<2>** Can be set via p0728 as input (DI) or output (DO).

**<3>** Pre-assignment, can be freely changed.
## 2.6 Internal control/status words

### Function diagrams

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>2501</td>
<td>Control word, sequence control</td>
<td>2-814</td>
</tr>
<tr>
<td>2503</td>
<td>Status word, sequence control</td>
<td>2-815</td>
</tr>
<tr>
<td>2505</td>
<td>Control word, setpoint channel</td>
<td>2-816</td>
</tr>
<tr>
<td>2520</td>
<td>Control word, speed controller</td>
<td>2-817</td>
</tr>
<tr>
<td>2522</td>
<td>Status word, speed controller</td>
<td>2-818</td>
</tr>
<tr>
<td>2526</td>
<td>Status word, closed-loop control</td>
<td>2-819</td>
</tr>
<tr>
<td>2530</td>
<td>Status word, current control</td>
<td>2-820</td>
</tr>
<tr>
<td>2534</td>
<td>Status word, monitoring functions 1</td>
<td>2-821</td>
</tr>
<tr>
<td>2536</td>
<td>Status word, monitoring functions 2</td>
<td>2-822</td>
</tr>
<tr>
<td>2537</td>
<td>Status word, monitoring functions 3</td>
<td>2-823</td>
</tr>
<tr>
<td>2546</td>
<td>Control word, faults/alarms</td>
<td>2-824</td>
</tr>
<tr>
<td>2548</td>
<td>Status word, faults/alarms 1 and 2</td>
<td>2-825</td>
</tr>
</tbody>
</table>
Fig. 2-56  Control word, sequence control

- Internal control/status words

0 = OFF1 active
1 = Operating condition, no coast down active (OFF2 inactive)
2 = Operating condition, no fast stop active (OFF3 inactive)
3 = Command, close brake
4 = Command, open brake
5 = Jog 1
6 = Jog 2
7 = Enable operation
8 = Enable ramp-function generator
9 = Enable speed setpoint
10 = Control via PLC
11 = Speed controller enable
12
13
14
15

<1> STW1.10 must be set to ensure that the drive object accepts the process data (PZD).
<2> PROFIdrive interconnection: For PROFIdrive standard telegrams, the upper inputs are connected with PROFIdrive-STW1 [2420]. Only relevant for CDS0.
<3> When the master control is retrieved, predefined by STARTER.
<4> Only applies if the function module "extended brake control (r0108.14 = 1)" is active.

To the control unit [2610]
To the control unit [2610]
To the control unit [2610]
To the control unit [2610]
To the control unit [2610]
To the setpoint channel [3060.6] [3070.7] [3080.5]
To the setpoint channel [3060.1] [3070.1]
To the brake control [2701.4]
To the extended brake control [2707.1]
To the extended brake control [2707.1]
To the torque setpoint [6060.4]
To the brake control [2701.4]
To the extended brake control [2707.1]
Internal control/status words - Status word, sequence control

<table>
<thead>
<tr>
<th>Bit No.</th>
<th>Status word sequence control</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td><code>1 = Ready to power-up</code></td>
</tr>
<tr>
<td>1</td>
<td><code>1 = Ready to operate</code> (DC link loaded, pulses blocked)</td>
</tr>
<tr>
<td>2</td>
<td><code>1 = Operation enabled</code> (drive follows n_set)</td>
</tr>
<tr>
<td>3</td>
<td><code>1 = Jog active</code></td>
</tr>
<tr>
<td>4</td>
<td><code>1 = No coast down active</code> (OFF2 inactive)</td>
</tr>
<tr>
<td>5</td>
<td><code>1 = No fast stop active</code> (OFF3 inactive)</td>
</tr>
<tr>
<td>6</td>
<td><code>1 = Power-on inhibit active</code></td>
</tr>
<tr>
<td>7</td>
<td><code>1 = Drive ready</code></td>
</tr>
<tr>
<td>8</td>
<td><code>1 = Controller enable</code></td>
</tr>
<tr>
<td>9</td>
<td><code>1 = Control requested &lt;1&gt;</code></td>
</tr>
<tr>
<td>10</td>
<td>Reserved</td>
</tr>
<tr>
<td>11</td>
<td><code>1 = Pulses enabled</code></td>
</tr>
<tr>
<td>12</td>
<td><code>1 = Open holding brake</code> (only for booksize units when the brake is connected to the power unit)</td>
</tr>
<tr>
<td>13</td>
<td><code>1 = Command, close holding brake</code></td>
</tr>
<tr>
<td>14</td>
<td><code>1 = Pulse enable from the brake control</code></td>
</tr>
<tr>
<td>15</td>
<td><code>1 = Enable setpoint from the brake control</code></td>
</tr>
</tbody>
</table>

Bit 9 = 1 --> Ready to exchange process data

- `1. OFF1` Enable internal missing or fault with this reaction
- `2. OFF2`
- `3. OFF3`

<1> The drive object is ready to accept data.
<2> If "Safe Brake Control" (SBC) is activated and selected, the brake is no longer controlled via this signal.
<3> These signals are only relevant if the "extended brake control" function module is active (p0108.14 = 1).
Fig. 2-59 - Control word, speed controller

Internal control/status words - Control word, speed controller

<table>
<thead>
<tr>
<th>Bit No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Travel to fixed stop</td>
</tr>
<tr>
<td>2</td>
<td>Reserved</td>
</tr>
<tr>
<td>3</td>
<td>Reserved</td>
</tr>
<tr>
<td>4</td>
<td>Reserved</td>
</tr>
<tr>
<td>5</td>
<td>Closed-loop torque control active</td>
</tr>
<tr>
<td>6</td>
<td>Reserved</td>
</tr>
<tr>
<td>7</td>
<td>Closed-loop torque control active</td>
</tr>
<tr>
<td>8</td>
<td>Reserved</td>
</tr>
<tr>
<td>9</td>
<td>Reserved</td>
</tr>
<tr>
<td>10</td>
<td>Reserved</td>
</tr>
<tr>
<td>11</td>
<td>Reserved</td>
</tr>
<tr>
<td>12</td>
<td>Reserved</td>
</tr>
<tr>
<td>13</td>
<td>Reserved</td>
</tr>
<tr>
<td>14</td>
<td>Reserved</td>
</tr>
<tr>
<td>15</td>
<td>Reserved</td>
</tr>
</tbody>
</table>

Function diagrams

1. To the closed-loop speed control
2. To the closed-loop torque control
3. Motor locked/stalled (8012.5)
4. STW n_ctrl
5. 1000.00 μs
6. r1406
7. 30.10.08 V04.04.01
8. 2520 - Control word, speed controller
9. SERVO

DO: SERVO

fp_2520_98_eng.vsd
Fig. 2-60 2522 – Status word, speed controller

From the changeover, closed-loop control types [5060.5]
From the setpoint, n-ctrl [5040.7]
From torque limiting [5610.4]
From torque limiting, upper, active
From torque limiting, lower, active
From the setpoint, n-ctrl [5030.8]
<1> From the speed controller [5210.8]
<1> Only for servo control without encoder.

Bit No. | Status word, speed controller | Servo
--- | --- | ---
0 | 1 = V/f control active | ✔
1 | 1 = Sensorless operation active | ✔
2 | 1 = Closed-loop torque control active | ✔
3 | 1 = Closed-loop speed control active | ✔
4 | Reserved | ✔
5 | 1 = Speed controller, I component held | ✔
6 | 1 = Speed controller, I component set | ✔
7 | 1 = Torque limit reached | ✔
8 | 1 = Torque limiting, upper, active | ✔
9 | 1 = Torque limiting, lower, active | ✔
10 | 1 = Droop enabled | ✔
11 | 1 = Speed setpoint limited | ✔
12 | 1 = Ramp-function generator set | ✔
13 | 1 = Sensorless operation due to a fault | ✔
14 | 1 = I/f control active | ✔
15 | Reserved | ✔

<1> Only for servo control without encoder.

To the speed actual value and pole position sensing, motor encoder (encoder 1) [4710.4]
Ramp-function generator tracking [3080.1]
"Traveling blocks" mode [3616.1]
Motor locked/stalled [8012.5]

Motor Module: p0115[1] > 0 (interconnected)
Motion-based PolID OFF1 OFF3 STOP2

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Status word closed-loop control

<table>
<thead>
<tr>
<th>Bit No.</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Reserved</td>
</tr>
<tr>
<td>1</td>
<td>1 = De-magnetization completed</td>
</tr>
<tr>
<td>2</td>
<td>Reserved</td>
</tr>
<tr>
<td>3</td>
<td>Reserved</td>
</tr>
<tr>
<td>4</td>
<td>1 = Magnetization completed</td>
</tr>
<tr>
<td>5</td>
<td>Reserved</td>
</tr>
<tr>
<td>6</td>
<td>Reserved</td>
</tr>
<tr>
<td>7</td>
<td>Reserved</td>
</tr>
<tr>
<td>8</td>
<td>1 = Field weakening active</td>
</tr>
<tr>
<td>9</td>
<td>Reserved</td>
</tr>
<tr>
<td>10</td>
<td>Reserved</td>
</tr>
<tr>
<td>11</td>
<td>Reserved</td>
</tr>
<tr>
<td>12</td>
<td>Reserved</td>
</tr>
<tr>
<td>13</td>
<td>Reserved</td>
</tr>
<tr>
<td>14</td>
<td>1 = Vdc_max controller active</td>
</tr>
<tr>
<td>15</td>
<td>1 = Vdc_min controller active</td>
</tr>
</tbody>
</table>

Refer to [1020.7]
Status word closed-loop current control

<table>
<thead>
<tr>
<th>Bit No.</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1 = Closed-loop current control active</td>
</tr>
<tr>
<td>1</td>
<td>Reserved</td>
</tr>
<tr>
<td>2</td>
<td>Reserved</td>
</tr>
<tr>
<td>3</td>
<td>Reserved</td>
</tr>
<tr>
<td>4</td>
<td>1 = Limiting Ud active</td>
</tr>
<tr>
<td>5</td>
<td>1 = Limiting Uq active</td>
</tr>
<tr>
<td>6</td>
<td>1 = Pos. limit. Iq active</td>
</tr>
<tr>
<td>7</td>
<td>1 = Neg. limit. Iq active</td>
</tr>
<tr>
<td>8</td>
<td>1 = Iq setpoint limit. active</td>
</tr>
<tr>
<td>9</td>
<td>1 = Id setpoint limit. active</td>
</tr>
<tr>
<td>10</td>
<td>Reserved</td>
</tr>
<tr>
<td>11</td>
<td>Reserved</td>
</tr>
<tr>
<td>12</td>
<td>Reserved</td>
</tr>
<tr>
<td>13</td>
<td>Reserved</td>
</tr>
<tr>
<td>14</td>
<td>Reserved</td>
</tr>
<tr>
<td>15</td>
<td>Reserved</td>
</tr>
</tbody>
</table>

Meaning:
- 1 = Closed-loop current control active
- 1 = Limiting Ud active
- 1 = Limiting Uq active
- 1 = Pos. limit. Iq active
- 1 = Neg. limit. Iq active
- 1 = Iq setpoint limit. active
- 1 = Id setpoint limit. active

Refer to [1020.7]
### Bit No.

<table>
<thead>
<tr>
<th>Bit No.</th>
<th>Status word, monitoring functions 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Reserved</td>
</tr>
<tr>
<td>1</td>
<td>$</td>
</tr>
<tr>
<td>2</td>
<td>$</td>
</tr>
<tr>
<td>3</td>
<td>1 = $n_{act} \geq 0$</td>
</tr>
<tr>
<td>4</td>
<td>Reserved</td>
</tr>
<tr>
<td>5</td>
<td>Reserved</td>
</tr>
<tr>
<td>6</td>
<td>$n_{act} &gt; n_{\text{max}}$</td>
</tr>
<tr>
<td>7</td>
<td>1 = Speed setpoint - actual value deviation within tolerance $t_{off}$</td>
</tr>
<tr>
<td>8</td>
<td>Reserved</td>
</tr>
<tr>
<td>9</td>
<td>Reserved</td>
</tr>
<tr>
<td>10</td>
<td>Reserved</td>
</tr>
</tbody>
</table>

<1> $n_{act} = $ smoothed speed actual value r2169 [8010.2].

---

**Fig. 2-63**

<table>
<thead>
<tr>
<th>Bit No.</th>
<th>Status word, monitoring functions 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Reserved</td>
</tr>
<tr>
<td>1</td>
<td>$</td>
</tr>
<tr>
<td>2</td>
<td>$</td>
</tr>
<tr>
<td>3</td>
<td>1 = $n_{act} \geq 0$</td>
</tr>
<tr>
<td>4</td>
<td>Reserved</td>
</tr>
<tr>
<td>5</td>
<td>Reserved</td>
</tr>
<tr>
<td>6</td>
<td>$n_{act} &gt; n_{\text{max}}$</td>
</tr>
<tr>
<td>7</td>
<td>1 = Speed setpoint - actual value deviation within tolerance $t_{off}$</td>
</tr>
<tr>
<td>8</td>
<td>Reserved</td>
</tr>
<tr>
<td>9</td>
<td>Reserved</td>
</tr>
<tr>
<td>10</td>
<td>Reserved</td>
</tr>
</tbody>
</table>

<1> $n_{act} = $ smoothed speed actual value r2169 [8010.2].
### Function Diagram for Status Word, Monitoring Functions 2

#### Bit No. Status Word Monitoring 2

<table>
<thead>
<tr>
<th>Bit No.</th>
<th>Status Word Monitoring 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Reserved</td>
</tr>
<tr>
<td>1</td>
<td>Reserved</td>
</tr>
<tr>
<td>2</td>
<td>Reserved</td>
</tr>
<tr>
<td>3</td>
<td>Reserved</td>
</tr>
<tr>
<td>4</td>
<td>From speed signals [8011.8] 1 =</td>
</tr>
<tr>
<td>5</td>
<td>From speed signals [8011.8] 1 = n_set &gt;0</td>
</tr>
<tr>
<td>6</td>
<td>From torque messages, motor locked/stalled [8012.8] 1 = Motor blocked</td>
</tr>
<tr>
<td>7</td>
<td>From torque messages, motor locked/stalled [8012.8] 1 = Motor stalled</td>
</tr>
<tr>
<td>8</td>
<td>Reserved</td>
</tr>
<tr>
<td>9</td>
<td>Reserved</td>
</tr>
<tr>
<td>10</td>
<td>From torque messages, motor locked/stalled [8012.3] 1 = Torque setpoint &lt; torque threshold value 1 (p2174)</td>
</tr>
<tr>
<td>11</td>
<td>From load monitoring [8013.8] 1 = Load monitoring signals an alarm</td>
</tr>
<tr>
<td>12</td>
<td>From load monitoring [8013.8] 1 = Load monitoring signals a fault</td>
</tr>
<tr>
<td>13</td>
<td>Reserved</td>
</tr>
<tr>
<td>14</td>
<td>Reserved</td>
</tr>
<tr>
<td>15</td>
<td>Reserved</td>
</tr>
</tbody>
</table>

#### Notes:
- <1> Only relevant if the function module "extended signals/monitoring functions" (r0108.17 = 1) is active.
- 250.00 μs

---

**Internal Control/status words**

**Fig. 2-64**

**DO: SERVO**

**fp_2536_98_eng.vsd**

**Function diagram**

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Bit No. | Status word, monitoring functions 3
---|---
0 | $\text{n}_{\text{act}} < \text{speed threshold value 3 (p2161)}$
1 | $\text{f or n comparison value reached or exceeded (p2141)}$
2 | Reserved
3 | Reserved
4 | $\text{Speed setpoint - actual value deviation within tolerance } t_{\text{on}}$
5 | $\text{Ramp-up/ramp-down completed}$
6 | $\text{Current below residual current threshold}$
7 | Reserved
8 | Reserved
9 | Reserved
10 | Reserved
11 | $\text{Torque utilization < torque threshold value 2 (p2194)}$
12 | Reserved
13 | Reserved
14 | Reserved
15 | Reserved

<sup>1</sup> n_{act} = smoothed speed actual value r2169 [8010.2].

From speed signals 1 [8010.8]:
- Bit 0: $\text{n}_{\text{act}} < \text{speed threshold value 3 (p2161)}$
- Bit 1: $\text{f or n comparison value reached or exceeded (p2141)}$

From speed signals 2 [8011.8]:
- Bit 4: $\text{Speed setpoint - actual value deviation within tolerance } t_{\text{on}}$
- Bit 5: $\text{Ramp-up/ramp-down completed}$
- Bit 6: $\text{Current below residual current threshold}$

From torque signals [8012.5]:
- Bit 11: $\text{Torque utilization < torque threshold value 2 (p2194)}$

**Function diagram**

PROFdrive bit

1000.00 μs

ZSW monitoring functions 3

**2537 – Status word, monitoring functions 3**

**Internal control/status words**
### Internal control/status words - Control word, faults/alarms

<table>
<thead>
<tr>
<th>Bit No.</th>
<th>Control word, faults/alarms</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Reserved</td>
</tr>
<tr>
<td>1</td>
<td>Reserved</td>
</tr>
<tr>
<td>2</td>
<td>Reserved</td>
</tr>
<tr>
<td>3</td>
<td>Reserved</td>
</tr>
<tr>
<td>4</td>
<td>Reserved</td>
</tr>
<tr>
<td>5</td>
<td>Reserved</td>
</tr>
<tr>
<td>6</td>
<td>Reserved</td>
</tr>
<tr>
<td>7</td>
<td>Acknowledge faults</td>
</tr>
<tr>
<td>8</td>
<td>Reserved</td>
</tr>
<tr>
<td>9</td>
<td>Reserved</td>
</tr>
<tr>
<td>10</td>
<td>External alarm 1 (A07850)</td>
</tr>
<tr>
<td>11</td>
<td>External alarm 2 (A07851)</td>
</tr>
<tr>
<td>12</td>
<td>External alarm 3 (A07852)</td>
</tr>
<tr>
<td>13</td>
<td>External fault 1 (F07860)</td>
</tr>
<tr>
<td>14</td>
<td>External fault 2 (F07861)</td>
</tr>
<tr>
<td>15</td>
<td>External fault 3 (F07862)</td>
</tr>
</tbody>
</table>

- **Note:**
  - Bit 7 = Acknowledge faults
  - Bits 10 to 15 refer to faults and alarms.
  - Bit 10 refers to the Control Unit and is used as source to simultaneously acknowledge all faults on all drive objects.

**Parameters:***
- **p2102[C]:** Acknowledge all faults
- **p2112[C]:** To fault buffer [8060.1]
- **p2116[C]:** To alarm buffer [8065.1]
- **p2117[C]:** To alarm buffer [8065.1]
- **p2106[C]:** To alarm buffer [8065.1]
- **p2107[C]:** To fault buffer [8060.1]
- **p3110:** Time delay in ms

**Function diagram notes:**
- This parameter refers to the Control Unit and is used as source to simultaneously acknowledge all faults on all drive objects.
- These parameters refer to the Command Data Sets (CDS) depending on the individual drive object (DO).
Fig. 2-67 2548 – Status word, faults/alarms 1 and 2

<table>
<thead>
<tr>
<th>Bit No.</th>
<th>Status word, faults/alarms 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1 = Acknowledgement running</td>
</tr>
<tr>
<td>1</td>
<td>Reserved</td>
</tr>
<tr>
<td>2</td>
<td>Reserved</td>
</tr>
<tr>
<td>3</td>
<td>1 = Fault present</td>
</tr>
<tr>
<td>4</td>
<td>Reserved</td>
</tr>
<tr>
<td>5</td>
<td>1 = Safety signal present</td>
</tr>
<tr>
<td>6</td>
<td>1 = Internal signal 1 present</td>
</tr>
<tr>
<td>7</td>
<td>1 = Alarm present</td>
</tr>
<tr>
<td>8</td>
<td>1 = Internal signal 2 present</td>
</tr>
<tr>
<td>9</td>
<td>Reserved</td>
</tr>
<tr>
<td>10</td>
<td>Reserved</td>
</tr>
<tr>
<td>11</td>
<td>1 = Alarm class bit 0</td>
</tr>
<tr>
<td>12</td>
<td>1 = Alarm class bit 1</td>
</tr>
<tr>
<td>13</td>
<td>Reserved</td>
</tr>
<tr>
<td>14</td>
<td>Reserved</td>
</tr>
<tr>
<td>15</td>
<td>Reserved</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bit No.</th>
<th>Status word, faults/alarms 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1 = Fault, encoder 1</td>
</tr>
<tr>
<td>1</td>
<td>1 = Fault, encoder 2</td>
</tr>
<tr>
<td>2</td>
<td>1 = Fault, encoder 3</td>
</tr>
<tr>
<td>3</td>
<td>Reserved</td>
</tr>
<tr>
<td>4</td>
<td>Reserved</td>
</tr>
<tr>
<td>5</td>
<td>1 = Fault transformer overtemperature</td>
</tr>
<tr>
<td>6</td>
<td>1 = Alarm transformer overtemperature</td>
</tr>
<tr>
<td>7</td>
<td>1 = Fault motor overtemperature</td>
</tr>
<tr>
<td>8</td>
<td>1 = Alarm motor overtemperature</td>
</tr>
<tr>
<td>9</td>
<td>1 = Fault, thermal overload, power module</td>
</tr>
<tr>
<td>10</td>
<td>1 = Alarm, thermal overload, power module</td>
</tr>
</tbody>
</table>

From the thermal monitoring, transformer [8016.8]
From the thermal monitoring, transformer [8016.8]
From the thermal monitoring, motor [8016.8]
From the thermal monitoring, power module [8014.8]
From the thermal monitoring, power module [8014.8]

Source sampling time
Refer to [1020.7]
2.7 Sequence control

Function diagrams

<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>2610</td>
<td>Sequencer</td>
<td>2-827</td>
</tr>
<tr>
<td>2634</td>
<td>Missing enable signals, line contactor control</td>
<td>2-828</td>
</tr>
</tbody>
</table>
Fig. 2-68 2610 – Sequencer

S1: Power-on inhibit
ZSWA.00 = 1, ZSWA.11 = 0
ZSWA.00/01/02 = 0

S2: Ready to power up
Main contactor is OPEN
Wait for power-up or jog
ZSWA.00 = 1, ZSWA.11 = 0

S3: Ready
Line contactor is CLOSED
Wait for pre-charging
ZSWA.00/01 = 1, ZSWA.11 = 0
ZSWA.02/06 = 0

S4: Operation
Pulses enabled
Controller enabled
No jog operation: Setpoints enabled
"0 = OFF" (STWA.xx)
ZSWA.00/01/02 = 1
ZSWA.11 = 1
ZSWA.06 = 0

S5a: Ramp stop
Ramp-down to n <= 0, then inhibit the pulses
ZSWA.00/01/02 = 1
ZSWA.11 = 1
ZSWA.02/06 = 0

S5b: Fast stop
Bring the drive to n <= 0 along the fast stopping ramp or torque limit, then inhibit the pulses
ZSWA.00/01/02 = 1
ZSWA.11 = 1
ZSWA.02/06 = 0

S5c: Jogging - down ramp
Ramp-down to n <= 0, then inhibit the pulses
ZSWA.00/01 = 1, ZSWA.11 = 0
ZSWA.02/06 = 0

Faults
F07300...F07802
F6000

$p0862$
UDC uploaded
Energize contactor
$p0863.0$
No LT_fault

Controller enable
"0 = OFF" (STWA.xx)
STO selected
$r0046.8$
STO selected
$p0857...p0862$

Controller enable
"0 = OFF" (STWA.xx)
STO selected
$r0046.8$
STO selected
$p0857...p0862$

Controller enable
"0 = OFF" (STWA.xx)
STO selected
$r0046.8$
STO selected
$p0857...p0862$

Controller enable
"0 = OFF" (STWA.xx)
STO selected
$r0046.8$
STO selected
$p0857...p0862$

Controller enable
"0 = OFF" (STWA.xx)
STO selected
$r0046.8$
STO selected
$p0857...p0862$

Controller enable
"0 = OFF" (STWA.xx)
STO selected
$r0046.8$
STO selected
$p0857...p0862$

Controller enable
"0 = OFF" (STWA.xx)
STO selected
$r0046.8$
STO selected
$p0857...p0862$

Controller enable
"0 = OFF" (STWA.xx)
STO selected
$r0046.8$
STO selected
$p0857...p0862$

Controller enable
"0 = OFF" (STWA.xx)
STO selected
$r0046.8$
STO selected
$p0857...p0862$

Controller enable
"0 = OFF" (STWA.xx)
STO selected
$r0046.8$
STO selected
$p0857...p0862$

Controller enable
"0 = OFF" (STWA.xx)
STO selected
$r0046.8$
STO selected
$p0857...p0862$

Controller enable
"0 = OFF" (STWA.xx)
STO selected
$r0046.8$
STO selected
$p0857...p0862$

Controller enable
"0 = OFF" (STWA.xx)
STO selected
$r0046.8$
STO selected
$p0857...p0862$

Controller enable
"0 = OFF" (STWA.xx)
STO selected
$r0046.8$
STO selected
$p0857...p0862$

Controller enable
"0 = OFF" (STWA.xx)
STO selected
$r0046.8$
STO selected
$p0857...p0862$

Controller enable
"0 = OFF" (STWA.xx)
STO selected
$r0046.8$
STO selected
$p0857...p0862$

Controller enable
"0 = OFF" (STWA.xx)
STO selected
$r0046.8$
STO selected
$p0857...p0862$

Controller enable
"0 = OFF" (STWA.xx)
STO selected
$r0046.8$
STO selected
$p0857...p0862$

Controller enable
"0 = OFF" (STWA.xx)
STO selected
$r0046.8$
STO selected
$p0857...p0862$

Controller enable
"0 = OFF" (STWA.xx)
STO selected
$r0046.8$
STO selected
$p0857...p0862$

Controller enable
"0 = OFF" (STWA.xx)
STO selected
$r0046.8$
STO selected
$fp_{2610.98}\_eng.vsd$

<1> POWER ON = 24 V electronics supply OFF -> ON or RESET button.
<2> The sequence control is implemented according to the PROFdrive profile.
<3> These control commands can also be triggered by a fault response.
<4> STWA.xx = control word, sequence control, bit xx (r0699) [2501]; ZSWA.xx = status word, sequence control bit xx (r0699) [2503].
<5> Only if "Safety Integrated" is active.
<6> The parameters p1226, p1227 and p1228 influence this status.
Missing enable signals

Missing enable signals that prevent the drive going into operation (this situation can be detected at the ZSW sequence control, infeed r0899.2 = 1 (8926)).

<table>
<thead>
<tr>
<th>Bit Nr</th>
<th>Bedeutung</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1 = OFF1, enable missing</td>
</tr>
<tr>
<td>1</td>
<td>1 = OFF2, enable missing</td>
</tr>
<tr>
<td>2</td>
<td>1 = OFF3, enable missing</td>
</tr>
<tr>
<td>3</td>
<td>1 = Enable operation missing</td>
</tr>
<tr>
<td>4</td>
<td>1 = Armature short-circuit/DC braking, enable missing</td>
</tr>
<tr>
<td>5</td>
<td>1 = STOP2, enable missing</td>
</tr>
<tr>
<td>6</td>
<td>1 = STOP1, enable missing</td>
</tr>
<tr>
<td>7</td>
<td>1 = EP terminals, enable missing</td>
</tr>
<tr>
<td>8</td>
<td>1 = Infeed, enable missing</td>
</tr>
<tr>
<td>9</td>
<td>1 = Ramp-function generator enable missing</td>
</tr>
<tr>
<td>10</td>
<td>1 = Ramp-function generator start missing</td>
</tr>
<tr>
<td>11</td>
<td>1 = Setpoint, enable missing</td>
</tr>
<tr>
<td>12</td>
<td>1 = OFF1, enable, internal missing</td>
</tr>
<tr>
<td>13</td>
<td>1 = OFF2, enable, internal missing</td>
</tr>
<tr>
<td>14</td>
<td>1 = OFF3, enable, internal missing</td>
</tr>
<tr>
<td>15</td>
<td>1 = Pulse enable, internal missing</td>
</tr>
<tr>
<td>16</td>
<td>1 = Internal armature short circuit/DC braking, enable missing</td>
</tr>
<tr>
<td>17</td>
<td>1 = STOP2, enable internal missing</td>
</tr>
<tr>
<td>18</td>
<td>1 = STOP1, enable internal missing</td>
</tr>
<tr>
<td>19</td>
<td>1 = Function bypass active</td>
</tr>
<tr>
<td>20</td>
<td>1 = Drive inactive or not operational</td>
</tr>
<tr>
<td>21</td>
<td>1 = Ramp-function generator enable missing</td>
</tr>
<tr>
<td>22</td>
<td>1 = Ramp-function generator start missing</td>
</tr>
<tr>
<td>23</td>
<td>1 = Setpoint, enable missing</td>
</tr>
<tr>
<td>24</td>
<td>1 = OFF1, enable, internal missing</td>
</tr>
<tr>
<td>25</td>
<td>1 = OFF2, enable, internal missing</td>
</tr>
<tr>
<td>26</td>
<td>1 = OFF3, enable, internal missing</td>
</tr>
<tr>
<td>27</td>
<td>1 = Pulse enable, internal missing</td>
</tr>
<tr>
<td>28</td>
<td>1 = Internal armature short circuit/DC braking, enable missing</td>
</tr>
<tr>
<td>29</td>
<td>1 = STOP2, enable internal missing</td>
</tr>
<tr>
<td>30</td>
<td>1 = STOP1, enable internal missing</td>
</tr>
<tr>
<td>31</td>
<td>1 = Function bypass active</td>
</tr>
</tbody>
</table>

Logic operation

AND operation

OR operation

Fault with OFF3 response

Line contactor control

Line contactor control from sequence control

Energize line contactor

Logic diagrams

Function diagram 0046

Control Unit

From the line supply

To the infeed

Sequence control - Missing enable signals, line contactor control, logic operation

Function diagram fp_2634_98_eng.vsd

SINAMICS S110

11.04.11 V04.04.00
2.8 Brake control

Function diagrams

<table>
<thead>
<tr>
<th>Function Code</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>2701</td>
<td>Basic brake control (r0108.14 = 0)</td>
<td>2-830</td>
</tr>
<tr>
<td>2704</td>
<td>Extended brake control, zero-speed detection (r0108.14 = 1)</td>
<td>2-831</td>
</tr>
<tr>
<td>2707</td>
<td>Extended brake control, open/close brake (r0108.14 = 1)</td>
<td>2-832</td>
</tr>
<tr>
<td>2711</td>
<td>Extended brake control, signal outputs (r0108.14 = 1)</td>
<td>2-833</td>
</tr>
</tbody>
</table>
Fig. 2-70 2701 – Basic brake control (r0108.14 = 0)

- 2701 -

Function diagram

Braking control - Basic braking control (r0108.14 = 0)

Note: Braking signal diagnostic evaluation (p1278) only applies for SBC (Safe Brake Control) (controls the Safe Brake Relay).

<1> Motor holding brake configuration (p1215)
0 = No motor holding brake being used
1 = Motor holding brake acc. to sequence control
2 = Motor holding brake always released
3 = Motor holding brake like sequence control, connection via BICO

<2> Priority assignment (high > low): p1215, p0858, p0855, p0856, sequence control.

<3> If p1215 = 0, 2 -> t = 0 ms.
<4> Only if Safety Integrated is active.

<5> For p1227 = 300 s, the monitoring function is deactivated.
<6> If an external motor holding brake is used, p1215 should be set to 3 and r0899.12 should be interconnected as control signal.
<7> r0046.21 = 0, as long as r0046 = 0 (OFF1 enable missing or power-on inhibit).
r0046.21 = 1, if p0858 = 1 or p0856 = 0. The signal generation is shown simplified.
<8> The internal signal includes signals that lead to OFF1 or OFF3 (e.g. BICO or fault response).
<9> If the brake is permanently applied or released (p0855, p0858 or p1215), the drive does not wait while the brake is released or applied.

Background
Refer to [1020.7]

Motor holding brake configuration (p1215)
0 = No motor holding brake being used
1 = Motor holding brake acc. to sequence control
2 = Motor holding brake always released
3 = Motor holding brake like sequence control, connection via BICO

Priority assignment (high > low): p1215, p0858, p0855, p0856, sequence control.
<3> If p1215 = 0, 2 -> t = 0 ms.
<5> For p1227 = 300 s, the monitoring function is deactivated.
<7> r0046.21 = 0, as long as r0046 = 0 (OFF1 enable missing or power-on inhibit).
<9> If the brake is permanently applied or released (p0855, p0858 or p1215), the drive does not wait while the brake is released or applied.

Note: Braking signal diagnostic evaluation (p1278) only applies for SBC (Safe Brake Control) (controls the Safe Brake Relay).

Do: SERVO

Table: 2701 - Basic brake control (r0108.14 = 0)

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
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<tr>
<td>30.09.11</td>
<td>fP_2701_98_eng.vsd</td>
<td>Function diagram</td>
<td>- 2701 -</td>
<td>SINAMICS S110</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Braking control - Extended braking control, zero-speed detection (r0108.14 = 1)

1. Shutdown threshold of the standstill detection. In this case (e.g. when using a brake), another criterion than the speed actual value can be selected to clear the pulses. Otherwise, we recommend to keep the factory setting.

2. For p1276 = 300.000 s, the timer is deactivated, i.e. the timer output is always 0. Note: When operating a motor with a brake which must not be applied while the motor is rotating, the monitoring time of both timers must be set to 300 s.

3. For operation without brake, p1224[0...3] must be 0 (factory setting) in order to avoid undesirable interaction with the sequence control.

4. The internal signal comprises signals that lead to OFF1 or OFF3, e.g. BICO or fault response.

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
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<th>8</th>
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<tbody>
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<td>Function diagram</td>
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<tr>
<td>Braking control - Extended braking control, zero-speed detection (r0108.14 = 1)</td>
<td>30.09.11 V04.04.00</td>
<td>SINAMICS S110</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Braking control - Extended braking control, open/close brake (r0108.14 = 1)

- Motor holding brake configuration:
  0 = No brake or brake always applied (brake connected to the power unit)
  1 = Brake control active (brake connected to the power unit)
  2 = Brake always released (brake connected to the power unit)
  3 = Brake control active (brake connection can be interconnected using BICO)

Note:
A motor brake cannot be connected to all power units. p1215 is set to 3 and the brake is controlled via a digital output.

- If the brake is permanently applied or released (p0855, p0858 or p1215), the drive does not wait until the brake is released or applied.

- These blocks/modules are evaluated with the same sampling rate as the brake control and therefore may only be used to individually adapt the brake control.

- If the p1215 = 0, the brake is not used for the motor holding brake configuration.

- Priority assignment (high -> low): p1215, p0858, p0855, p0856/p1219, apply brake from standstill detection, p1218.

---

DO: SERVO

Braking control - Extended braking control, open/close brake (r0108.14 = 1)

fp_2707_98_eng.vsd  09.09.08  V04.04.00  SINAMICS S110
2711 - Extended brake control, signal outputs (r0108.14 = 1)

- Cooldown not active (r0899.4)
- Enable operation (r0898.3)
- Power-on inhibit (r0899.6)

**Close brake from standstill detection**

1. **Brake feedback closed**
   - **p1222**
   - 0...10,000 ms
   - p1217 (100)

2. **Brake feedback open**
   - **p1223**
   - 0...10,000 ms
   - p1216 (100)

**Close brake (internal)**

1. **RESET** (Q=0)
2. **SET** (Q=1)

**Open brake (internal)**

- **Brake with feedback signal**
  - p1275.5
- **Brake is being used**
  - p1215 > 0

**Close brake from standstill detection**

1. **Brake does not close**
   - r1229.1
2. **Brake does not open**
   - r1229.4
3. **Brake with feedback signal**
   - p1223
4. **Brake is being used**
   - p1215 > 0
5. **Brake is being used**
   - p1215 > 0

**Note:**
- This pulse enable path only works for operation with brake (p1215 > 0).
- For brakes with one single checkback signal, the inverted signal has to be interconnected to the BICO input for the second checkback. The switching times of the brake are set in p1216 and p1217.
- If an external motor holding brake is used, p1215 should be set to 3 and r1229.1 should be used as control signal.
- The internal signal comprises signals that lead to OFF1 or OFF3, e.g. BICO or fault response.
- If the function module "extended brake control" is active (r0108.14 = 1), r1229.1 should be interconnected as control signal.

**Function Diagram:**

- **2707.1:** Request pulse enable
- **2704.5:** Brake does not close
- **2610.8:** Pulse enable from the brake control
- **2503.3:** Pulse enable from the expanded brake control
- **2503.1:** Setpoint enable from the brake control
- **2503.3:** Close brake from standstill detection
- **2503.7:** Enable operation (r0898.3)
- **2503.7:** Power-on inhibit (r0899.6)

**Note:** Braking signal diagnostic evaluation (p1278) is only relevant for SBC (Safe Brake Control) (controls the Safe Brake Relay).
# 2.9 Safety Integrated

## Function diagrams

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>2800</td>
<td>Basic Functions, parameter manager</td>
<td>2-835</td>
</tr>
<tr>
<td>2802</td>
<td>Basic Functions, monitoring functions and faults/alarm</td>
<td>2-836</td>
</tr>
<tr>
<td>2804</td>
<td>Basic Functions, status words</td>
<td>2-837</td>
</tr>
<tr>
<td>2810</td>
<td>Basic Functions, STO (Safe Torque Off)/SS1 (Safe Stop 1)</td>
<td>2-838</td>
</tr>
<tr>
<td>2811</td>
<td>Basic Functions, STO (Safe Torque Off), safe pulse cancellation</td>
<td>2-839</td>
</tr>
<tr>
<td>2814</td>
<td>Basic Functions, SBC (Safe Brake Control)</td>
<td>2-840</td>
</tr>
<tr>
<td>2820</td>
<td>Extended Functions, SLS (Safely-Limited Speed)</td>
<td>2-841</td>
</tr>
<tr>
<td>2825</td>
<td>Extended Functions, SS1, SS2, SOS, internal STOP B, C, D, F</td>
<td>2-842</td>
</tr>
<tr>
<td>2840</td>
<td>Extended Functions, control word and status word</td>
<td>2-843</td>
</tr>
<tr>
<td>2846</td>
<td>Extended Functions, parameter manager</td>
<td>2-844</td>
</tr>
<tr>
<td>2850</td>
<td>Extended Functions (F-DI 0 ... F-DI 2)</td>
<td>2-845</td>
</tr>
<tr>
<td>2853</td>
<td>Extended Functions (F-DO 0)</td>
<td>2-846</td>
</tr>
<tr>
<td>2855</td>
<td>Extended Functions, control interface</td>
<td>2-847</td>
</tr>
<tr>
<td>2856</td>
<td>Extended Functions, Safe State selection</td>
<td>2-848</td>
</tr>
<tr>
<td>2857</td>
<td>Extended Functions, assignment (F-DO 0)</td>
<td>2-849</td>
</tr>
<tr>
<td>2858</td>
<td>Extended Functions, control via PROFIsafe (p9601.2 = p9601.3 = 1)</td>
<td>2-850</td>
</tr>
<tr>
<td>2860</td>
<td>Extended Functions, SSM (Safe Speed Monitor)</td>
<td>2-851</td>
</tr>
<tr>
<td>2861</td>
<td>Extended Functions, SDI (Safe Direction)</td>
<td>2-852</td>
</tr>
</tbody>
</table>
### Change safety parameters

**Safety parameterizing enable**

- Enter password
- **x**: Effective password

**Safety parameters**

- **p9601** – **p9899** can be changed
- **p9899**

**Safety commissioning mode**

- **[2802.1]**
- **[2804.1]**
- **[2810.3]**

- **-> select STO**

**Reset safety parameters**

- Inhibit safety functions **p9601 = 0**
- **[2810.3]**

**Safety parameters**

- **p9601** – **p9899** can be reset to the factory settings via **p0970, p3900**

- **p0010 = 95**

**Safety commissioning mode**

- **[2802.1]**
- **[2804.1]**
- **[2810.3]**

- **-> select STO**

**Checksum check for safety parameters**

- **p9899**
- **p0010 = 95**

**Exit safety commissioning mode**

- **<3>**

### Remarks

- **<1> Comparator, refer to [1021]**
- **<2> Analog signal memory, refer to [1021]**
- **<3> The target checksum must be equal to the actual checksum.**

---

**Table:**

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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<tbody>
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<td><strong>DO: SERVO</strong></td>
<td>fp_2800_98_eng.vsd</td>
<td>Function diagram</td>
<td>- 2800 -</td>
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<tr>
<td><strong>Safety Integrated - Basic Functions, Parameter manager</strong></td>
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<td>V04.04.00</td>
<td>SINAMICS S110</td>
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<td></td>
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</tr>
</tbody>
</table>
### Fig. 2-75 2802 – Basic Functions, monitoring functions and faults/alarms

**Function Diagram**

#### Function Diagram:

- **Safety Integrated version**
- **Monitoring clock cycle**
- **STOP F -> A P1**
- **STOP F -> A P2**
- **DO: SERVO**

#### Faults/alarms

- P1: F/A01600 ... 01699
- P2: F/A30600 ... 30699

#### Information

- **Additional diagnostics**
- **Cross checking list**
- **Diagnostics for STOP F**

#### Safety Monitoring Functions

- **F01611**
- **F30611**
- **STOP F**
- **Timer for emergency retraction**

#### Faults with response **"none"**

- R9772.15 (P1) [2804.2]
- R9872.15 (P2) [2804.5]

#### Faults with response **"immediate pulse cancellation"**

- R9772.10 (P1) [2804.2]
- R9872.10 (P2) [2804.5]

#### Faults with response **"immediate pulse cancellation"** that cannot be acknowledged

- R9772.9 (P1) [2804.2]
- R9872.9 (P2) [2804.5]

#### Status SS1

- **Status SS1 P1**
- **Status SS1 P2**

#### Additional Information

- **2 ms**

### Table

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
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<td></td>
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<td><strong>Safety Integrated - Basic Functions, Monitoring functions and faults/alarms</strong></td>
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<td><strong>26.04.11 V04.04.00</strong></td>
<td></td>
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</tr>
</tbody>
</table>
Fig. 2-76 2804 – Basic Functions, status words

Status word Safety Integrated Processor 1

Bit No. Status (Processor 1) Status word Safety Integrated Processor 2

2810.7 0 1 = STO selected on Control Unit 2810.7 0 1 = STO on Motor Module selected

2811.6 1 1 = STO active on Control Unit 2811.3 1 1 = STO on Motor Module active

2810.5 2 1 = SS1 delay time active on the Control Unit 2810.5 2 1 = SS1 delay time on Motor Module active

2814.3 4 1 = SBC requested 2814.3 4 1 = SBC requested

2814.4 5 1 = SS1 selected on the Control Unit (Basic Functions) 2814.4 5 1 = SS1 selected on the Motor Module (Basic Functions)

2814.5 6 1 = SS1 active on the Control Unit (Basic Functions) 2814.5 6 1 = SS1 active on the Motor Module (Basic Functions)

2802.7 9 1 = STOP A cannot be acknowledged, active 2802.7 9 1 = STOP A cannot be acknowledged, active

2802.8 10 1 = STOP A active 2802.8 10 1 = STOP A active

2802.5 15 1 = STOP F active

2810.6 16 1 = STO cause: Safety comm. mode 2810.6 16 1 = STO cause: Safety comm. mode

2810.3 17 1 = STO cause selection via terminal (Basic Functions) 2810.3 17 1 = STO cause selection via terminal (Basic Functions)

2825.8 18 1 = STO cause: selection via SMM 19 Reserved

2810.3 19 1 = STO cause actual value missing

2810.6 20 1 = STO cause selection PROFIsafe (Basic Functions) 2810.6 20 1 = STO cause selection PROFIsafe (Basic Functions)

2810.3 21 Reserved

2810.3 22 1 = SS1 cause selection terminal (Basic Functions) 2810.3 22 1 = SS1 cause selection terminal (Basic Functions)

2810.4 23 1 = SS1 cause selection PROFIsafe (Basic Functions) 2810.4 23 1 = SS1 cause selection PROFIsafe (Basic Functions)

2802.3 24 1 = Slave Motor Module ready for communication

Status word Safety Integrated Processor 1 and Processor 2

Bit No. Status (Processor 1 + Processor 2)

2810.7 0 1 = STO selected in drive

2811.6 1 1 = STO active in drive

2810.5 2 1 = SS1 delay time active in the drive

2814.3 4 1 = SBC requested

2814.4 5 1 = SS1 selected in the drive (Basic Functions)

2814.5 6 1 = SS1 active in the drive (Basic Functions)

2802.7 9 1 = STOP A cannot be acknowledged, active in the drive

2802.8 10 1 = STOP A active in the drive

2802.5 15 1 = STOP F active

2810.6 16 1 = STO cause: Safety comm. mode

2810.3 17 1 = STO cause selection via terminal (Basic Functions)

2825.8 18 1 = STO cause: selection via SMM

2810.3 19 1 = STO cause actual value missing

2810.6 20 1 = STO cause selection PROFIsafe (Basic Functions)

2810.3 21 Reserved

2810.3 22 1 = SS1 cause selection terminal (Basic Functions)

2810.4 23 1 = SS1 cause selection PROFIsafe (Basic Functions)

2802.3 24 1 = Slave Motor Module ready for communication

1 2 3 4 5 6 7 8

DO: SERVO

Safety Integrated - Basic functions, status words
Fig. 2-77 2810 – Basic Functions, STO (Safe Torque Off)/SS1 (Safe Stop 1)

Function diagram

**Safety Integrated** - Basic Functions, STO (Safe Torque Off), SS1 (Safe Stop 1)

1. STO cause selection via terminal
2. Request pulse suppression P1
3. Timer forced checking procedure
4. Monitoring for simultaneous occurrence

- Redundant functions
- 1 = STO on P1 selected
- 1 = STO on P2 selected
- 1 = STO release

- F-DI chg tol P1 p9650
- F-DI chg tol P2 p9850

- Timer forced checking procedure
- "Shutdown paths must be tested"

- Switch-on delay according to [1022] starts when the "request pulse suppression P1" is withdrawn.

- Redundant functions in the Control Unit (P1) and Power Module (P2).

PM-IF: Power Module interface
SS1: Safe Stop 1
STO: Safe Torque Off

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Fig. 2-78  
2011 - Basic Functions, STO (Safe Torque Off), Safe Pulse cancellation

Power Module

- Request Pulse suppression P1 [2810.8]
- Request Pulse suppression P2 [2810.8]
- SHUT Down path from P1 0 = STO_P1 [2814.2]
- SHUT Down path from P2 0 = STO_P2 [2814.2]

1 = STO on P2 active
1 = STO active* for sequence control

[2805.6] 1 = STO on P2 active
[2804.5]
[2802.1] [2814.2]
[2802.1] [2814.2]

DO: SERVO

Safety Integrated - Basic Functions, STO (Safe Torque Off), Save Pulse suppression

Function diagram
Fig. 2-79 2814 – Basic Functions, SBC (Safe Brake Control)

**Control Unit (Processor 1)**

- **Enable signals for SBC P1**
  - Safety enable p9601 → 0
  - Enable SBC p9602 → 1

- **Causes for “close brake”**
  - From the STO shutdown paths [2810.6]
    - 0 = STO_P1
  - 0 = STO_P2
  - 0 = Pulses canceled [2810.7]
  - DIAG_U
  - DIAG_L
  - Safety fault [2802.8]
    - 1 = STOP A

- **BR+ and BR- outputs are only available for compact drive units.**

- **Safety Logic CU (P1)**
  - (Implementation and monitoring of brake control)
  - 1 = “Fault, brake control”
  - 0 = “SBC requested”

- **Power Module (Processor 2)**

- **Causes for “safely close brake”**
  - From the STO Shutdown paths [2810.6]
    - 0 = STO_P1
  - 0 = STO_P2
  - 0 = Pulses canceled [2810.7]
  - DIAG_U
  - DIAG_L
  - Safety fault [2802.8]
    - 1 = STOP A

- **Enable signals for SBC P2**
  - Safety enable p9801 → 0
  - Enable SBC p9802 → 1

- **Safety Logic PM (P2)**
  - (Implementation and monitoring of brake control)
  - 1 = “Fault, brake control”
  - 0 = “SBC requested”

- **Diagnostic signal**
  - 1 = Transistor conductive

- **Upper gating control channel**
  - +24 V
  - BR+<1>
  - BR_DIAG [2802.1]

- **Lower gating control channel**
  - BR2<1>
  - BR+<1>
  - BR_DIAG [2802.1]

- **Safety Logic PM (P2)**
  - (Implementation and monitoring of brake control)
  - 1 = “Fault, brake control”
  - 0 = “SBC requested”

- **Function diagram**
  - F07830 “Incorrect brake control”
  - F01630 “Incorrect safety brake control, P1”

- **Safety Integrated - Basic Functions, SBC (Safe Brake Control)**
Function diagrams

Safety Integrated - Extended Functions, SS1, SS2, SOS, Internal STOP B, C, D, F

1. DOI: SERVO
   - 2. Safely Integrated
   - 3. Extended Functions, SS1, SS2, SOS, Internal STOP B, C, D, F
   - 4. DOI: SERVO
   - 5. 26.04.11 V04.04.00
   - 6. SINAMICS S110
   - 7. Function diagram
   - 8. SINAMICS S110

- <1> Only for p9601.2 = 1 and p9801.2 = 1.
- <2> Only at drive via terminals.
- <3> Only at drive via PROFIsafe.
Fig. 2-82  2840 – Extended Functions, control word and status word

Safety Integrated - Extended Functions, control word

1 = STO deselection
1/0 = Acknowledgement
1 = SLS selection bit 0 active
1 = SLS selection bit 1 active

0

1 = STO active
1 = SS1 active
1 = SS2 active

0

1 = SLS deselection
1 = SOS deselection
1 = SLS active
1 = SOS active
1 = Active SLS stage, bit 0
1 = Active SLS stage, bit 1

0

1 = Deselect SDI positive
1 = Deselect SDI negative
1 = SDI positive active
1 = SDI negative active

0

<1> Only at drive of the Extended Functions via terminals.
<2> Only at drive of the Extended Functions via PROFIsafe
Changing Safety parameters

Safety Integrated commissioning
p0010 = 95
SI password input
p9761
SI password new
p9762
SI ackn password
p9763

Password entry

x

SET

Effective password

y = x

<1>

Disabling Safety functions
SI Mtn enable P2
p9301 = 0
SI Mtn enable P1
p9501 = 0
SI enable fct P1
p9601 = 0
SI enable fct P2
p9801 = 0

<1> Comparator, see [1021].
<2> Analog signal memory, see [1021].
<3> The target checksum must be equal to the actual checksum.

Resetting safety parameters
Safety parameter
p9300 ... p9399
p9500 ... p9599
p10000 ... p10199

<1>

Quit Safety commissioning mode

p0010 = 95
Safety parameters
p9300 ... p9399
p9500 ... p9599
p10000 ... p10199
are valid after save; STARTER issues a message if a POWER ON is required

Checksum check
for Safety parameters

<1>

<2>

= p9398
SI act CRC P2
p9399
SI act CRC P2

= p9728
SI ref CRC
p9729

= p0970, p3900
Safety parameter
p9300 ... p9399
p9500 ... p9599
p10000 ... p10199
can be reset to
factory settings via
p0970, p3900

Safety parameter
p9300 ... p9399
p9500 ... p9599
p10000 ... p10199
can be changed

Changing Safety parameters
Function diagram

F-DO: Failsafe Digital Output

Signaling parameters are only written to when Safety Integrated is activated.

-2853- Extended Functions (F-DO 0)
Fig. 2-88  
2857 - Extended Functions, assignment (F-DO 0)

<table>
<thead>
<tr>
<th>0: No function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: Pulses cancelled</td>
</tr>
<tr>
<td>2: SS1 active</td>
</tr>
<tr>
<td>3: SS2 active</td>
</tr>
<tr>
<td>4: SOS active</td>
</tr>
<tr>
<td>5: SLS active</td>
</tr>
<tr>
<td>6: SSM feedback signal active</td>
</tr>
<tr>
<td>7: Safe State</td>
</tr>
<tr>
<td>8: SOS selected</td>
</tr>
<tr>
<td>9: Internal event</td>
</tr>
<tr>
<td>10: Active SLS threshold bit 0</td>
</tr>
<tr>
<td>11: Active SLS threshold bit 1</td>
</tr>
<tr>
<td>12: SDI positive active</td>
</tr>
<tr>
<td>13: SDI negative active</td>
</tr>
</tbody>
</table>

Function diagram:
- DO: CU_S110
- fp_2857_98_eng.vsd
- Function diagram
- 2857
**Fig. 2-89 2858 – Extended Functions, control via PROFIsafe (p9601.2 = p9601.3 = 1)**

**Function diagram**

---

**Extended Functions**

- **STO active**
  - r9722.0
  - [2825.8]
- **SS1 active**
  - r9722.1
  - [2825.8]
- **SS2 active**
  - r9722.2
  - [2825.8]
- **SOS active**
  - r9722.3
  - [2825.8]
- **SLS active**
  - r9722.4
  - [2820.8]
- **Internal event**
  - r9722.7
  - [2820.8]
- **Active SLS stage bit 0**
  - [2840.8]
- **Active SLS stage bit 1**
  - [2840.8]
- **SOS selected**
  - r9722.11
  - [2840.8]
- **SDI pos active**
  - r9722.12
  - [2861.8]
- **SDI neg active**
  - r9722.13
  - [2861.8]
- **SSM (speed below limit value)**
  - r9722.15
  - [2860.8]

---

**Safe motion monitoring functions**

- **De-select STO**
  - r9720.0
  - [2825.1]
- **De-select SS1**
  - r9720.1
  - [2825.1]
- **De-select SS2**
  - r9720.2
  - [2825.1]
- **De-select SOS**
  - r9720.3
  - [2825.1]
- **De-select SLS**
  - r9720.4
  - [2820.1]
- **Quitierung**
  - r9720.7
  - [2840.4]
- **Select SLS bit 0**
  - r9720.8
  - [2820.1]
- **Select SLS bit 1**
  - r9720.10
  - [2820.1]
- **Deselect SDI positive**
  - r9720.12
  - [2861.1]
- **Deselect SDI negative**
  - r9720.13
  - [2861.1]

---

**PROFIsafe communication via PROFIBUS/PROFINET**

1. **DO: SERVO**
2. fp_2858_98_eng.vsd
3. Function diagram
4. Safety Integrated - Extended Functions, control via PROFIsafe (p9601.2 = p9601.3 = 1)
5. SINAMICS S110
6. 26.04.11 V04.04.00
7. - 2858 -
Fig. 2-90  2860 - Extended Functions, SSM (Safe Speed Monitor)

Enable SSM hysteresis filter p9501.16 (0000 bin)

Enable SSM hysteresis filter p9301.16 (0000 bin)

Load-side v_act r9714(0)

Safe speed recording

0.00...100.00 [ms]
p9545 (0.00)

0.00...100 000.00 [μs]
p9345 (0.00)

Si Mtn SSM hyst P1 0.00...1000 000.00 [1/min] p9547 (10.0000)

Si Mtn SSM hyst P2 0.00...1000 000.00 [1/min] p9347 (10.0000)

Si Mtn SSM v_lim P1 0.00...1000 000.00 [1/min] p9546 (20.00)

Si Mtn SSM v_lim P2 0.00...1000 000.00 [1/min] p9346 (20.00)

Si Mtn integ stat p9722

SSI (speed below limit value) p9722.15

[2840.5]
## 2.10 Setpoint channel

### Function diagrams

<table>
<thead>
<tr>
<th>Function Code</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>3010</td>
<td>Fixed speed setpoints</td>
<td>2-854</td>
</tr>
<tr>
<td>3020</td>
<td>Motorized potentiometer</td>
<td>2-855</td>
</tr>
<tr>
<td>3030</td>
<td>Main/supplementary setpoint, setpoint scaling, jogging</td>
<td>2-856</td>
</tr>
<tr>
<td>3040</td>
<td>Direction limitation and direction reversal</td>
<td>2-857</td>
</tr>
<tr>
<td>3050</td>
<td>Skip frequency bands and speed limitations</td>
<td>2-858</td>
</tr>
<tr>
<td>3060</td>
<td>Basic ramp-function generator</td>
<td>2-859</td>
</tr>
<tr>
<td>3070</td>
<td>Extended ramp-function generator</td>
<td>2-860</td>
</tr>
<tr>
<td>3080</td>
<td>Ramp-function generator selection, status word, tracking</td>
<td>2-861</td>
</tr>
</tbody>
</table>
For SERVO, the following applies:
Only if the function module "extended setpoint channel" is activated (p1068.8 = 1).
The setpoint for the motorized potentiometer is not saved and after ON is entered using p1040.

The setpoint for the motorized potentiometer is saved in a fashion after OFF and after ON set to the saved value.

Without ramp generator in automatic mode (ramp-up/ramp-down time = 0).

With ramp generator in automatic mode.

Without initial rounding.

With initial rounding. The ramp-up/down time set is exceeded accordingly.

Not saved in the NVRAM.

Save in NVRAM active.

= Hochlaufgeber ist bei Impulsperre inaktiv.

= Hochlaufgeber wird unabhängig von der Impulsfreigabe gerechnet.

<1> For automatic commissioning, p1037 and p1038 are set to the maximum motor speed or to the rated motor speed, provided that n_max_Mot has not been specified.

<2> If initial rounding-off is active (p1030.2 = 1), the selected ramp-up/down times are exceeded accordingly.

<3> Only effective if p1030.0 = 0.

<100> Only if the function module "extended setpoint channel" is activated (r0108.8 = 1).
Fig. 2-94 3030 – Main/supplementary setpoint, setpoint scaling, jogging

Main setpoint
- [p1070] (1024)
- Main setp scal [p1071]

Supplement setpoint
- [p1075]

Fixed value 1 [%] [2900]
Fixed value 2 [%] [2901]
Suppl setp scal [p1076]

Jogging
- Jog 1 [r0898.8]
- Jog 2 [r0899.8]

Setpoint channel - Main/supplementary setpoint, setpoint scaling, jogging

<100> Only if the function module "extended setpoint channel" is activated (r0108.8 = 1).

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
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<tr>
<td>Setpoint channel - Main/supplementary setpoint, setpoint scaling, jogging</td>
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<tr>
<td>30.09.11 V04.04.00</td>
<td>Function diagram</td>
<td>SINAMICS S110</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
3040 – Direction limitation and direction reversal

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SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3

Fig. 2-95

4000.00 μs
Refer to [1020.7]
<100>

p1111 1 = Inhibit positive direction
[2505.3] r1198.6

p1110 1 = Inhibit negative direction
[2505.3] r1198.5

p1113 1 = Setpoint inversion
[2505.3] r1198.11

n_limit setp
p1063[D]

[3030.8]

n_set_1

Setp after lim

0

0

0

0

-1 1

0

r1114

[3050.1]

1

1

4

5

6
fp_3040_98_eng.vsd
14.07.09 V04.04.00

7
Function diagram
SINAMICS S110

8
- 3040 -

Function diagrams

2-857

1
2
3
DO: SERVO
Setpoint channel - Direction limitation and direction reversal

Setpoint channel

<100> Only if the function module “extended setpoint channel“ is activated (r0108.8 = 1).


Fig. 2-96  3050 – Skip frequency bands and speed limitations

Minimum speed
0.00...19 500.00 rpm
p1080[D] (0.00)

Setpt after limit
r1114
[3040.8]

<1> A suppression speed of "0" de-activates the suppression speed bandwidth.

<2> The setting range of p1082 is limited to n_max_mot.

<3> If the drive is not stopped via the input setpoint, but via controlled intervention, the lower hysteresis branch is relevant after a subsequent run-up.

<100> For SERVO, the following applies: Only if the function module "Extended setpoint channel" is activated (r0108.8 = 1). For r0108.8 = 0, [3095] applies for the generation of the speed limits.

---

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
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<tbody>
<tr>
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</table>

SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3
**Setpoint channel - Basic ramp-function generator**

**Function diagrams**

**Fig. 2-97**

- **Ramp-up time**
  - 0.000...999 999.000 s
  - \( p1120[D] \) (10.000)
- **Ramp-down time**
  - 0.000...999 999.000 s
  - \( p1121[D] \) (10.000)
- **OFF3 ramp-down time**
  - 0.000...600.000 s
  - \( p1135[D] \) (0.000)

**Threshold for "Ramp-up/ramp-down active"**

- 0.00...1000.00 rpm
  - \( p1148[D] \) (19.80)

**Ramp-up active**

- \( p1140 \) (2501.3) \( [3095.7] \)

**Ramp-down active**

- \( p1142 \) (2501.3) \( [3098.8] \)

**Ramp flattening-off**

- \( p1144 \) (2501.3) \( [3080.8] \)

**Freeze ramp-function generator**

- \( p1149 \) (2501.3) \( [3080.5] \)

**RFG setpt at input**

- \( p1119 \) (3050.8)

**Accept RFG set val**

- \( p1143[C] \) (0)

**RFG setting value**

- \( p1142[C] \) (0)

**DO: SERVO**

- SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3

**Setpoint channel - Basic ramp-function generator**

- fp_3060_98_eng.vsd

**Function diagram**

30.09.11 V04.04.00

**SINAMICS S110**
Function diagrams

Fig. 2-99  3080 – Ramp-function generator selection, status word, tracking

Ramp-function generator selection

```
4000.00 μs
Refer to [1020.7]
```

Torque limit reached

```
[2522.7] 11407.7
```

For p1145 > 0, ramp-function generator tracking is activated when the torque limiting responds. This means that the speed controller output only exceeds the torque limit by a deviation that can be set via p1145.

For OFF1/OFF3, the ramp-function generator ramp is active. The ramp-function generator is set to the actual value and stops the drive with the ramp-downtime (p1121 or p1135). STW1.4 (enable ramp-function generator tracking active for OFF1/OFF3, the down ramp of the basic ramp-function generator is effective (refer to n_set_4 on [3060.8]).

The interpolator is only effective for clock-cycle synchronous PROFIBUS operation and sign-of-life received from the master (STW2.12 ... STW2.15).

Behavior of the response ramp of the torque limiting:

- p1145 = 0.0: No ramp-function generator tracking. The ramp-function generator ramp is no longer in the range of the speed actual value.
- p1145 = 1.0: The ramp-function generator ramp remains as close as possible to the speed actual value.
- p1145 > 1.0: The ramp-function generator ramp is steeper than for p1145 = 1.0 (higher "speed following error").

For SERVO, the following applies: Only when the function module "extended setpoint channel" is activated (r0108.8 = 0) is not active for OFF1/OFF3, the down ramp of the basic ramp-function generator is effective (refer to n_set_4 on [3060.8]).

The value is displayed correctly only with r0899.2 = 1 (Operation enabled).

Ramp-function generator tracking

```
250.00 μs
Refer to [1020.7]
```

Ramp flatting-off

```
[3060.1] [3070.3]
```

Ramp-function generator status word

```
Bit  Ramp-function generator status word
1    Ramp-down active
2    Ramp-function generator active
3    Ramp-function generator set
4    Ramp-function generator hold
5    Ramp-function generator tracking active
6    Maximum limiting active
7    Reserved
8    Reserved
9    Reserved
10   Reserved
11   Reserved
12   Reserved
13   Reserved
14   Reserved
15   Reserved
```

Setpoint channel - Ramp-function generator selection, status word, tracking
2.11 Setpoint channel not activated

Function diagrams

3095 – Generating the speed limits (r0108.8 = 0)
Setpoint channel not activated - Generating the speed limits (r0108.8 = 0)

With OFF1/OFF3, the deceleration ramp of the basic ramp-function generator is active (p1135 or p1121).

Applies only if the function module "expanded setpoint channel" (r0108.8 = 0) is not active. For r0108.8 = 1, [3050] applies instead of [3095].

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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<tr>
<td>DO: SERVO</td>
<td>3095 - Generating the speed limits (r0108.8 = 0)</td>
<td>fp_3095_98_eng.vsd</td>
<td>Function diagram</td>
<td>- 3095 -</td>
<td></td>
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</tr>
</tbody>
</table>
## 2.12 Basic positioner (EPOS)

### Function diagrams

<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>3610</td>
<td>Jog mode (r0108.4 = 1)</td>
<td>2-865</td>
</tr>
<tr>
<td>3612</td>
<td>Referencing/reference point approach mode (r0108.4 = 1) (p2597 = 0 signal)</td>
<td>2-866</td>
</tr>
<tr>
<td>3614</td>
<td>Flying referencing mode (r0108.4 = 1) (p2597 = 1 signal)</td>
<td>2-867</td>
</tr>
<tr>
<td>3615</td>
<td>Traversing block mode, external block change (r0108.4 = 1)</td>
<td>2-868</td>
</tr>
<tr>
<td>3616</td>
<td>Traversing block mode (r0108.4 = 1)</td>
<td>2-869</td>
</tr>
<tr>
<td>3617</td>
<td>Travel to fixed stop (r0108.4 = 1)</td>
<td>2-870</td>
</tr>
<tr>
<td>3618</td>
<td>Direct setpoint input/MDI mode, dynamic values (r0108.4 = 1)</td>
<td>2-871</td>
</tr>
<tr>
<td>3620</td>
<td>Direct setpoint input/MDI mode (r0108.4 = 1)</td>
<td>2-872</td>
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<td>3625</td>
<td>Mode control (r0108.4 = 1)</td>
<td>2-873</td>
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<td>3630</td>
<td>Traversing range limits (r0108.4 = 1)</td>
<td>2-874</td>
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<td>3635</td>
<td>Interpolator (r0108.4 = 1)</td>
<td>2-875</td>
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<tr>
<td>3640</td>
<td>Control word block selection/MDI selection (r0108.4 = 1)</td>
<td>2-876</td>
</tr>
<tr>
<td>3645</td>
<td>Status word 1 (r0108.3 = 1, r0108.4 = 1)</td>
<td>2-877</td>
</tr>
<tr>
<td>3646</td>
<td>Status word 2 (r0108.3 = 1, r0108.4 = 1)</td>
<td>2-878</td>
</tr>
<tr>
<td>3650</td>
<td>Status word, active traversing block/MDI active (r0108.4 = 1)</td>
<td>2-879</td>
</tr>
</tbody>
</table>
Fig. 2-101 3610 – Jog mode (r0108.4 = 1)

Motion variables in "jog" mode

<1> The connector outputs are only supplied with values from here if the "jog" mode is active.
<2> Jog incremental: The edge is only effective for setpoint = 0 (exception: Override = 0 %, Ci p2646).
Renewed jogging can only be activated after the jog motion has been completed (0/1 edge).
<3> The second "jog" is not evaluated while "incremental jogging" is running.

SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3

- 3610 -
Motion variables in "referencing/reference point approach" mode

<1> If no reference cam exists, the axis directly moves to the zero mark (in the defined start direction). Without a reference cam, the tolerance bandwidth is not evaluated.

<2> When "flying referencing" is selected (passive referencing, p2597 = 1 signal), this function diagram is of no significance => refer to [3614].

<3> The connector outputs are only supplied with values from here if the "referencing" mode is active.

<4> The reversing cams are low active. When a cam is actuated, motion (reference cam search) is continued in the opposite direction.

<5> Reference point setting is only effective in the initial state [3625].
Fig. 2-103  3614 - Flying referencing mode (r0108.4 = 1) (p2597 = 1 signal)

<1> When "reference point approach" is selected (active referencing p2597 = 0 signal), this function diagram is of no significance => refer to [3612].
Active traversing is not directly associated with the "flying referencing" mode (passive referencing, p2597 = 1 signal).
The mode can be superimposed on the "jog" [3610], "traversing blocks" [3614] and "direct setpoint input/MDI" [3618] modes.

<1> When "reference point approach" is selected (active referencing p2597 = 0 signal), this function diagram is of no significance => refer to [3612].
Active traversing is not directly associated with the "flying referencing" mode (passive referencing, p2597 = 1 signal).
The mode can be superimposed on the "jog" [3610], "traversing blocks" [3614] and "direct setpoint input/MDI" [3618] modes.

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
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<tr>
<td>EPOS - Flying referencing mode (r0108.4 = 1) (p2597 = 1 signal)</td>
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</table>
Fig. 2-104  3615 – Traversing block mode, external block change (r0108.4 = 1)

Function diagrams
Basic positioner (EPOS)

SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3

External block change (via the measuring probe or BICO)

Signal for external block change has not been received

A07463 “External block change not requested in the traversing block”

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
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<td>EPOS - Traversing block mode, external block change (r0108.4 = 1)</td>
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<td>04.04.08 V04.04.00</td>
<td>SINAMICS S110</td>
<td>3615</td>
<td>-</td>
<td>3615 -</td>
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</tbody>
</table>
**Basic positioner (EPOS) - Function diagrams**

Fig. 2-105 3616 – Traversing block mode (r0108.4 = 1)

- **Signal source feedback signals**
  - **Block selection**
    - p2625
    - p2626
    - p2627
    - p2628
    - p2629
    - p2630

- **Task ENDLESS_POS or ENDLESS_NEG**
  - Task  ENDLESS_POS or ENDLESS_NEG

- **Positioning mode**
  - Start of traversing range
  - End of traversing range

- **Status signals**
  - 1 = No intermediate stop
  - 0 = Intermediate stop
  - 1 = Do not reject traversing task
  - 0 = Reject traversing task

- **Motion variables**
  - 100 %

- **Torque limits**
  - Upper torque limiting effective [3617.7]
  - Lower torque limiting effective [3617.7]
  - Torque setpoint

- **Parameter index**
  - [0x0] 01 p2615
  - [3635.6] -1...
  - 0
  - 1

- **Actual traversing block**
  - [3650.2]

- **Position**
  - [3646.3]

- **Velocity**
  - [3620.4]

- **Acceleration**
  - [3620.1]

- **Deceleration**
  - [3620.4]

- **Signal source feedback signals**
  - External block change
  - Actual traversing block

- **Task mode**
  - [3677]

- **Task parameter**
  - [2675]

- **Task**
  - 1 = No intermediate stop
  - 0 = Intermediate stop

- **Parameter index**
  - [0x0] 01 p2615
  - [3635.6] -1...
  - 0
  - 1

- **Positioning mode**
  - Start of traversing range
  - End of traversing range

- **Status signals**
  - 1 = No intermediate stop
  - 0 = Intermediate stop
  - 1 = Do not reject traversing task
  - 0 = Reject traversing task

- **Motion variables**
  - 100 %

- **Torque limits**
  - Upper torque limiting effective [3617.7]
  - Lower torque limiting effective [3617.7]
  - Torque setpoint

- **Parameter index**
  - [0x0] 01 p2615
  - [3635.6] -1...
  - 0
  - 1
**Function diagrams**

**Basic positioner (EPOS)**

**Fig. 2-106** 3617 - Travel to fixed stop (r0108.4 = 1)

<table>
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<tr>
<th>1</th>
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<td>Function diagram</td>
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<td></td>
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<td>19.06.08 V04.04.00</td>
<td>SINAMICS S110</td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Fig. 2-107  
3618 – Direct setpoint input/MDI mode, dynamic values (r0108.4 = 1)
Fig. 2-108  3620 – Direct setpoint input/MDI mode (r0108.4 = 1)

1 = Continuous
0 = Edge

F07488
"Relative positioning not possible"

MDI trans_type sel
p2649
<4>
0 = Select positioning type
1 = Direction selection positive

MDI direct_sel pos
p2651
0 = Direction selection negative
1 = Direction selection positive

MDI direct_sel neg
p2652
0 = Direction selection negative
1 = Direction selection positive

MDI selection
1 = Do not reject traversing block

MDI pos_typ
p2648
1 = Absolute
0 = Relative

MDI s_set
p2647
1 = Select positioning type
0 = Positioning

MDI direct_sel pos
p2651
0 = Direction selection positive
1 = Direction selection negative

MDI direct_sel neg
p2652
0 = Direction selection negative
1 = Direction selection positive

MDI mode adapt
p2654
<4>
1 = Absolute
0 = Relative

<1> If connector input p2654 is assigned a connector input <> 0, the control signals "select positioning type", "direction selection positive" and "direction input negative" are internally supplied with values from this output.

Based on the value of the connector input, the following IDs are evaluated xxXx:

xx0x = absolute => p2648; xx1x = relative => p2648; xx2x = ABS_POS => p2648, p2651; xx3x = ABS_NEG => p2648, p2652.

<2> Only evaluated with transfer type "edge evaluation" (BI: p2649 = 0 signal).

<3> The connector outputs are only supplied with values from here if the "direct setpoint input MDI" mode is active.

<4> For the transfer type "continuous transfer" (BI: p2649 = 1 signal), relative positioning is not permissible.

Accept setpoint

Motion variables

1 = No intermediate stop
0 = Intermediate stop missing

1 = Setting-up
0 = Positioning

A07487
"Reject traversing task missing"

Acknowledgement, traversing block activated

A07486
"Intermediate stop missing"

MDI s_set

MDI v_set

MDI a_over

MDI -a over

Controller enable

Pos act/set value

p2657

1 = Continuous
0 = Edge

Store

p2678

<3>

p2671
<3>

p2672
<3>

End of traversing range

p2673
<3>

p2674
<3>

p2675
<3>

<1> If connector input p2654 is assigned a connector input <> 0, the control signals "select positioning type", "direction selection positive" and "direction input negative" are internally supplied with values from this output.

Based on the value of the connector input, the following IDs are evaluated xxXx:

xx0x = absolute => p2648; xx1x = relative => p2648; xx2x = ABS_POS => p2648, p2651; xx3x = ABS_NEG => p2648, p2652.

<2> Only evaluated with transfer type "edge evaluation" (BI: p2649 = 0 signal).

<3> The connector outputs are only supplied with values from here if the "direct setpoint input MDI" mode is active.

<4> For the transfer type "continuous transfer" (BI: p2649 = 1 signal), relative positioning is not permissible.
**Fig. 2-109 3625 – Mode control (r0108.4 = 1)**

**Initial state**
- "Target position reached" r2684.10 = 1
- "Axis stationary" r2199.0 = 1

**Direct setpoint input**
- r2684.15 = 1
- "Activate traversing task" p2649 = 0 and p2650 = 0/1
- Continuous transfer p2649 = 1 and r2665 <> Signal off CI: p2642

**Reference point approach**
- r2669 = 0 hex
- "Start referencing" p2595 = 0/1
- "Select reference type" p2597 = 0

**Ramp stop**
- r2684.10 = 0 / r2199.0 = 0
- "Do not reject traversing task" p2641 = 1
- "No intermediate stop" p2640 = 1
- "MDI selection" p2647 = 1
- 

**Jog mode**
- r2684.10 = 0
- r2199.0 = 0
- "Do not reject traversing task" p2641 = 1
- "No intermediate stop" p2640 = 1
- "Activate traversing task" p2631 = 0/1

**Traversing blocks active**
- r2684.10 = 0 / r2199.0 = 0
- r2684.15 = 1
- "Intermediate stop" p2640 = 0
- 

**Intermediate stop**
- r2199.0 = 1
- "Activate traversing task" p2649 = 0 and p2650 = 0/1
- "Direct setpoint input" p2647 = 0

**Do not reject traversing task**
- p2641 = 1

**No intermediate stop**
- p2640 = 1

**Direct setpoint input/MDI active**
- r2670.15
- 

**Positioning/setting-up**
- r2669 = 8 hex/10 hex
- 

**Drive at standstill**
- r2669 = 0 hex
- r2669 = 4 hex
- r2684.15 = 1
- r2684.10 = 0 / r2199.0 = 0
- "Traversing task completed" p2641 = 0

**Reference point approach completed:**
- "Do not reject traversing task" p2641 = 1
- "No intermediate stop" p2640 = 1
- "Activate traversing task" p2631 = 0/1

**<1> The more points exist at a transition, the higher the priority.**

**Basic positioner (EPOS)**

**Function diagrams**

**SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3**
When the "reference point approach" mode is active, the velocity override influences the approach velocity reference cams (p2605).

However, the approach velocity reference zero mark (p2608) and the approach velocity reference point (p2611) are not influenced.

1. When a cam responds, the drive brakes with maximum deceleration along the ramp. After the fault has been acknowledged, only movements away from the STOP cam are permitted.
### Control word, block selection

<table>
<thead>
<tr>
<th>Bit No.</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>0</td>
<td>1 = Traversing block selection, bit 0</td>
</tr>
<tr>
<td>1</td>
<td>1 = Traversing block selection, bit 1</td>
</tr>
<tr>
<td>2</td>
<td>1 = Traversing block selection, bit 2</td>
</tr>
<tr>
<td>3</td>
<td>1 = Traversing block selection, bit 3</td>
</tr>
<tr>
<td>4</td>
<td>1 = Traversing block selection, bit 4</td>
</tr>
<tr>
<td>5</td>
<td>1 = Traversing block selection, bit 5</td>
</tr>
<tr>
<td>6</td>
<td>Reserved</td>
</tr>
<tr>
<td>7</td>
<td>Reserved</td>
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<td>Reserved</td>
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<td>Reserved</td>
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<tr>
<td>14</td>
<td>Reserved</td>
</tr>
<tr>
<td>15</td>
<td>1 = MDI selection</td>
</tr>
</tbody>
</table>

#### Mode Selection

- **To “traversing block” mode [3616.3]**
- **To “direct setpoint input/MDI” mode [3620.1][3620.4]**
- **To mode control [3625.6]**

---

**Fig. 2-112**

3640 – Control word block selection/MDI selection (r0108.4 = 1)
### Status word, positioning mode 1

<table>
<thead>
<tr>
<th>Bit No.</th>
<th>Status Description</th>
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</thead>
<tbody>
<tr>
<td>0</td>
<td>0 = Tracking mode inactive, 1 = Tracking mode active</td>
</tr>
<tr>
<td>1</td>
<td>0 = Velocity limiting inactive, 1 = Velocity limiting active</td>
</tr>
<tr>
<td>2</td>
<td>0 = Setpoint static inactive, 1 = Setpoint static active</td>
</tr>
<tr>
<td>3</td>
<td>0 = Target position reached inactive, 1 = Target position reached active</td>
</tr>
<tr>
<td>4</td>
<td>0 = Axis moves forwards inactive, 1 = Axis moves forwards active</td>
</tr>
<tr>
<td>5</td>
<td>0 = Axis moves backwards inactive, 1 = Axis moves backwards active</td>
</tr>
<tr>
<td>6</td>
<td>0 = Software limit switch minus inactive, 1 = Software limit switch minus active</td>
</tr>
<tr>
<td>7</td>
<td>0 = Software limit switch plus inactive, 1 = Software limit switch plus active</td>
</tr>
<tr>
<td>8</td>
<td>0 = Position actual value &lt;= cam switching position 1 inactive, 1 = Position actual value &lt;= cam switching position 1 active</td>
</tr>
<tr>
<td>9</td>
<td>0 = Overrun cam switching position 1 inactive, 1 = Overrun cam switching position 1 active</td>
</tr>
<tr>
<td>10</td>
<td>0 = Direct output 1 inactive via the traversing block, 1 = Direct output 1 active via the traversing block</td>
</tr>
<tr>
<td>11</td>
<td>0 = Direct output 2 inactive via the traversing block, 1 = Direct output 2 active via the traversing block</td>
</tr>
<tr>
<td>12</td>
<td>0 = Fixed stop inactive, 1 = Fixed stop active</td>
</tr>
<tr>
<td>13</td>
<td>0 = Fixed stop, clamping torque inactive, 1 = Fixed stop, clamping torque active</td>
</tr>
<tr>
<td>14</td>
<td>0 = Travel to fixed stop inactive, 1 = Travel to fixed stop active</td>
</tr>
</tbody>
</table>
| 15      | Reserved

**Function diagram**:

- From interpolator [3635.7]
- From traversing range limits [3630.7]
- From interpolator [3635.7]
- From interpolator [3635.7]
- From interpolator [3635.7]
- From interpolator [3635.7]
- From interpolator [3635.7]
- From interpolator [3635.7]
- From dynamic following error monitoring, cam controllers [4025.8]
- From dynamic following error monitoring, cam controllers [4025.8]
- From “traversing block” mode [3616.7]
- From “traversing block” mode [3616.7]
- From “traversing block” mode [3616.7]
- From “traversing block” mode [3616.7]
- From “traversing block” mode [3616.7]
- From “traversing block” mode [3616.7]
Function diagrams

Basic positioner (EPOS)

Fig. 2-114 3646 – Status word 2 (r0108.3 = 1, r0108.4 = 1)

<table>
<thead>
<tr>
<th>Bit No.</th>
<th>Status word, positioning mode 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1 = Reference point approach active</td>
</tr>
<tr>
<td>1</td>
<td>1 = Flying referencing active</td>
</tr>
<tr>
<td>2</td>
<td>1 = Referencing active</td>
</tr>
<tr>
<td>3</td>
<td>1 = Print mark outside the outer window</td>
</tr>
<tr>
<td>4</td>
<td>1 = Axis is accelerating</td>
</tr>
<tr>
<td>5</td>
<td>1 = Axis is decelerating</td>
</tr>
<tr>
<td>6</td>
<td>1 = Jerk limiting active</td>
</tr>
<tr>
<td>7</td>
<td>1 = Activate correction</td>
</tr>
<tr>
<td>8</td>
<td>1 = Following error within tolerance</td>
</tr>
<tr>
<td>9</td>
<td>1 = Modulo correction active</td>
</tr>
<tr>
<td>10</td>
<td>1 = Target position reached</td>
</tr>
<tr>
<td>11</td>
<td>1 = Reference point set</td>
</tr>
<tr>
<td>12</td>
<td>1 = Acknowledgement traversing block activated</td>
</tr>
<tr>
<td>13</td>
<td>1 = STOP cam minus active</td>
</tr>
<tr>
<td>14</td>
<td>1 = STOP cam plus active</td>
</tr>
<tr>
<td>15</td>
<td>1 = Traversing command active</td>
</tr>
</tbody>
</table>

<1> By default, the status bit is supplied with values from the "traversing block" mode. However, if the "direct setpoint input/MDI" mode is active, it is supplied with values from this mode.

<2> The signal is only effective when the drive has reached the "Ready" state.

Reference point approach active

- From interpolator [3612.7]
- From "referencing/flying referencing" mode [3614.4]

Flying referencing

- From interpolator [3635.7]
- From interpolator [3635.4]

≥1

From dynamic following error monitoring, cam controllers [4025.8]

<2> From traversing range limits [3630.3]

From standstill/positioning monitoring [4020.8]

From "referencing" mode [3612.7]

<1> From "traversing block" mode [3616.7]

From "direct setpoint input/MDI" mode [3620.8]

From traversing range limits [3630.3]

From traversing range limits [3630.3]

From interpolator [3635.7]

1000.00 μs
Fig. 2-115  3650 – Status word, active traversing block/MDI active (r0108.4 = 1)

Actual block from "traversing block" mode

<table>
<thead>
<tr>
<th>Bit No.</th>
<th>Status word, active traversing block</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Active traversing block, bit 0</td>
</tr>
<tr>
<td>1</td>
<td>Active traversing block, bit 1</td>
</tr>
<tr>
<td>2</td>
<td>Active traversing block, bit 2</td>
</tr>
<tr>
<td>3</td>
<td>Active traversing block, bit 3</td>
</tr>
<tr>
<td>4</td>
<td>Active traversing block, bit 4</td>
</tr>
<tr>
<td>5</td>
<td>Active traversing block, bit 5</td>
</tr>
<tr>
<td>6</td>
<td>Reserved</td>
</tr>
<tr>
<td>7</td>
<td>Reserved</td>
</tr>
<tr>
<td>8</td>
<td>Reserved</td>
</tr>
<tr>
<td>9</td>
<td>Reserved</td>
</tr>
<tr>
<td>10</td>
<td>Reserved</td>
</tr>
<tr>
<td>11</td>
<td>Reserved</td>
</tr>
<tr>
<td>12</td>
<td>Reserved</td>
</tr>
<tr>
<td>13</td>
<td>Reserved</td>
</tr>
<tr>
<td>14</td>
<td>Reserved</td>
</tr>
<tr>
<td>15</td>
<td>1 = MDI active</td>
</tr>
</tbody>
</table>

Mode control [3625.7]

Actual block from "traversing block" mode [3616.4]
## 2.13 Position control

### Function diagrams

<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>4010</td>
<td>Position actual value preprocessing (r0108.3 = 1)</td>
<td>2-881</td>
</tr>
<tr>
<td>4015</td>
<td>Position controller (r0108.3 = 1)</td>
<td>2-882</td>
</tr>
<tr>
<td>4020</td>
<td>Standstill/positioning monitoring (r0108.3 = 1)</td>
<td>2-883</td>
</tr>
<tr>
<td>4025</td>
<td>Dynamic following error monitoring, cam controllers (r0108.3 = 1)</td>
<td>2-884</td>
</tr>
</tbody>
</table>
**Position control - Position actual value pre-processing (r0108.3 = 1)**

**Encoder 1**
- LU per 10 mm: 1...1048576
- LU per load rev: 1...1048576
- Mid/load motor rev: 1...1048576

**Function diagrams**
- Position controller: A07454, A07495, F07453, F07493, F07494
- Encoder 1: A07587, A07596, A07581, A07593, A07590

**encoder 1**
- Inkr
- Position offset
- Position difference between 2 sampling times

**DO: SERVO**
- fp_4010_98_eng.vsd
- SINAMICS S110
- 09.11.09 V04.04.00
Fig. 2-118 4020 – Standstill/positioning monitoring (r0108.3 = 1)

**Standstill monitoring**

- Standstill window
  - Position value
  - Target position
  - Position setpoint
  - Position actual value

**Positioning monitoring**

- Target position reached
  - Positioning monitoring is cyclically evaluated

---

<1> When the "basic positioner" function module (r0108.4 = 1) is active, these binector inputs are supplied by default with values from this module. The second value specifies the assignment.

---

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>DO: SERVO</td>
<td>Position control - Standstill/positioning monitoring (r0108.3 = 1)</td>
<td>fp_4020_98_eng.vsd</td>
<td>Function diagram</td>
<td>SINAMICS S110</td>
<td>22.04.08 V04.04.00</td>
<td>- 4020 -</td>
<td></td>
</tr>
</tbody>
</table>
Fig. 2-119 4025 – Dynamic following error monitoring, cam controllers (r0108.3 = 1)

Dynamic following error monitoring

1 = Following error within tolerance

1 = Fixed stop reached

1 = Fixed stop outside window

1 = Clamping active when traveling to fixed stop

1 = Position actual value <= cam switching position 1

1 = Position actual value <= cam switching position 2

<1> With a pre-control factor of less than 100 % (p2534 < 100 %), the PT1 model emulates an additional time constant of the control loop subordinate to the position controller.
2.14 Encoder evaluation

Function diagrams

<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>4704</td>
<td>Position and temperature sensing, encoders 1 ... 2</td>
<td>2-886</td>
</tr>
<tr>
<td>4710</td>
<td>Speed actual value and pole position sensing, motor encoder (encoder 1)</td>
<td>2-887</td>
</tr>
<tr>
<td>4720</td>
<td>Encoder interface, receive signals, encoders 1 ... 2</td>
<td>2-888</td>
</tr>
<tr>
<td>4730</td>
<td>Encoder interface, send signals, encoders 1 ... 2</td>
<td>2-889</td>
</tr>
<tr>
<td>4735</td>
<td>Reference mark search with external zero mark, encoder 1</td>
<td>2-890</td>
</tr>
</tbody>
</table>
Encoder evaluation - Position and speed sensing, encoders 1 ... 2

DO: SERVO

Function diagram fp_4704_98_eng.vsd

Encoder evaluation - Position and speed sensing, encoders 1 ... 2
Encoder evaluation - Speed actual value and pole position sensing, motor encoder (encoder 1)

<1> Ratio between the electrical and mechanical pole position (= motor pole pair number).

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>DO: SERVO</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Encoder evaluation - Speed actual value and pole pos. sensing, motor encoder (encoder 1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

fp_4710_98_eng.vsd

16.07.09 V04.04.00

SINAMICS S110
Encoder evaluation

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SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3

Fig. 2-122 4720 – Encoder interface, receive signals, encoders 1 ... 2

Function diagrams

Encoder evaluation

Function Diagram for Encoder Interface, Receive Signals, Encoders 1 ... 2

Bits 0...13 control what is transferred in Gn_XIST2.

There are 3 alternatives:

- Bit 7 = 0: Position actual value at the reference mark <1>
- Bit 7 = 1: Position actual value when the measuring probe edge is received <2>
- Bit 13 = 1: Cyclic absolute position value from absolute encoder <3>

The bits are processed with the following priority sequence (highest priority --> lowest priority bit): Bit 14 --> Bit 15 --> Bit 4-7 --> Bit 12 --> Bit 13.

Actual position values are read out from Gn_XIST2 using a handshake procedure.

1. Set r0487[0-2] according to the function to be activated.
2. Set r0487.4 (activate function)
3. Reset all bits from r0487[0-2] to 0.
4. r0481[0-2] must be active depending on the activated function.
5. Overtravel zero mark(s) until all bits in r0481[0-2] are reset to 0.
6. Select r0487[0-2] individually and activate with r0487.5 until r0481[4-7] is equal to 1 and read out the position values in r0483.
7. Reset all bits, starting with r0487.5 followed by r0487[0-2].

Select function 1 [Bit 3...0] ("search for reference mark")

Function active [Gn_ZSW Bit 0]

Actual value save at the reference mark

Read generated value [Bit 6...4]

Value from function 1 available [Gn_ZSW Bit 4]

Position actual value at reference mark 1 in Gn_XIST2

NOTE: SINAMICS S110 supports only one encoder. This encoder may be parameterized as encoder 1 or encoder 2.

Index [n-1] --> encoder n
Index [0] --> encoder 1
Index [1] --> encoder 2

If the "position module" function module (r0108.3 = 1) is activated, the interconnection is established via r2520[0-2] from [4010.8]:

If a standard telegram (PROFdrive) is selected, the interconnection is performed according to the specifications of the standard telegrams [2420].
Fig. 2-123 4730 – Encoder Interface, send signals, encoders 1 ... 2

Feedback signal of the active function (1 = function active)

- Bit 0: Function No.
  - 1: reference mark 1 or measuring probe 1
  - 2: reference mark 2 or measuring probe 1
  - 3: reference mark 3 or measuring probe 2
  - 4: reference mark 4 or measuring probe 2

- Bit 1: 1 = Position actual value from function 1
- Bit 2: 1 = Position actual value from function 2
- Bit 3: 1 = Position actual value from function 3
- Bit 4: 1 = Position actual value from function 4
- Bit 5: 1 = Measuring probe 1 deflected (high signal)
- Bit 6: 1 = Measuring probe 2 deflected (high signal)
- Bit 7: Status word from encoder n (n = 1, 2 or 3)
- Bit 8: 1 = Acknowledge encoder fault active
- Bit 9: Reserved
- Bit 10: Reserved
- Bit 11: 1 = Measuring probe 1 deflected (high signal)
- Bit 12: Reserved
- Bit 13: Generated value in Gn_XIST2 (and can be read)
- Bit 14: Cyclic absolute position value
- Bit 15: Parking encoder active (i.e. the encoder is not operational)

From the measuring probe evaluation [4740.4]

Encoder status bits from the position sensing, encoder n [4704.6]

PROFIdrive bit

Position value 2 from encoder n

The contents of position actual value 2 (Gn_XIST2) at [4704] depends on Gn_STW and Gn_ZSW.

- Undefined for a parking encoder (Gn_ZSW.14 = 1).
- For Gn_ZSW.15 = 1 the fault code for encoder faults is located here.
- Position actual value at the reference mark (for Gn_STW.7 = 0 and Gn_ZSW.4-7 > 0; with handshake).
- Position actual value due to flying measurement (for Gn_STW.7 = 1 and Gn_ZSW.4-7 > 0; with handshake).
- Cyclic absolute position value (free-running value, e.g. from the EQN absolute track (for Gn_ZSW.13 = 1)).

NOTE:
- SINAMICS S110 supports only one encoder. This encoder may be parameterized as encoder 1 or encoder 2.
Encoder evaluation - Reference mark search with equivalent zero mark, encoder 1

NOTE: SINAMICS S110 supports only one encoder. This encoder may be parameterized as encoder 1 or encoder 2.

The reference mark search is used with a digital interface. The encoder 0 edge is evaluated.

<1> The measured value memory is read out using a handshaking technique according to [4720], [4730], [4740].

<2> The reference mark is always used when traversing to an equivalent zero mark.

<3> All other bits in the encoder control word must be 0.

<4> Increasing position actual values (r0482) --> The 0/1 edge is evaluated. Decreasing position actual values (r0482) --> The 1/0 edge is evaluated.

Reference mark search

Select the function to be activated

Position value memory

Reference mark position to the encoder interface

Zero mark input

Digital input

DO: SERVO
Measuring probe evaluation

4740 – Probe evaluation, measured value memory, encoders 1 ... 2

Up to 4 measuring functions can be simultaneously active; the measured value memory is read out using a handshaking technique according to [4720], [4730].

- Selecting the function to be activated
- Activate selected function

NOTE: SINAMICS S110 supports only one encoder. This encoder may be parameterized as encoder 1 or encoder 2.

Selecting the function to be activated

Activate selected function

NOTE: SINAMICS S110 supports only one encoder. This encoder may be parameterized as encoder 1 or encoder 2.
## 2.15 Servo control

**Function diagrams**

<table>
<thead>
<tr>
<th>Function Code</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>5020</td>
<td>Speed setpoint filter and speed pre-control</td>
<td>2-893</td>
</tr>
<tr>
<td>5030</td>
<td>Reference model/pre-control balancing/speed limitation</td>
<td>2-894</td>
</tr>
<tr>
<td>5040</td>
<td>Speed controller with encoder</td>
<td>2-895</td>
</tr>
<tr>
<td>5042</td>
<td>Speed controller, torque/speed pre-control with encoder (p1402.4 = 1)</td>
<td>2-896</td>
</tr>
<tr>
<td>5050</td>
<td>Kp_n/Tn_n adaptation</td>
<td>2-897</td>
</tr>
<tr>
<td>5060</td>
<td>Torque setpoint, control type changeover</td>
<td>2-898</td>
</tr>
<tr>
<td>5210</td>
<td>Speed controller without encoder</td>
<td>2-899</td>
</tr>
<tr>
<td>5300</td>
<td>U/f control for diagnostics</td>
<td>2-900</td>
</tr>
<tr>
<td>5301</td>
<td>Signaling function variable</td>
<td>2-901</td>
</tr>
<tr>
<td>5490</td>
<td>Speed control configuration</td>
<td>2-902</td>
</tr>
<tr>
<td>5610</td>
<td>Torque limiting/reduction/interpolator</td>
<td>2-903</td>
</tr>
<tr>
<td>5620</td>
<td>Motoring/generating torque limit</td>
<td>2-904</td>
</tr>
<tr>
<td>5630</td>
<td>Upper/lower torque limit</td>
<td>2-905</td>
</tr>
<tr>
<td>5640</td>
<td>Mode changeover, power/current limiting</td>
<td>2-906</td>
</tr>
<tr>
<td>5650</td>
<td>Vdc_max controller and Vdc_min controller</td>
<td>2-907</td>
</tr>
<tr>
<td>5710</td>
<td>Current setpoint filter</td>
<td>2-908</td>
</tr>
<tr>
<td>5714</td>
<td>Iq and Id controller</td>
<td>2-909</td>
</tr>
<tr>
<td>5722</td>
<td>Field current/flux input, flux reduction, flux controller</td>
<td>2-910</td>
</tr>
<tr>
<td>5730</td>
<td>Interface to the Motor Module (gating signals, current actual values)</td>
<td>2-911</td>
</tr>
</tbody>
</table>
Fig. 2-126 5020 – Speed setpoint filter and speed pre-control

**Speed setpoint**

- Low-pass, 2nd order: Detailed representation at [1024].
- General 2nd-order filter: Detailed representation at [1024].
- Only for encoder: p1400.10 = 1 is recommended if a torque pre-control signal is also connected at [5060] in addition to the speed pre-control signal.
- The interpolator is only effective for clock-cycle synchronous PROFIdrive operation and sign-of-life received from the master (STW2.12...STW2.15).
- For a 1/0 edge from control command STW2.8 "travel to fixed stop" [2444] the output of all filters is set to the input value for an instantaneous response to a change of the speed setpoint sign.
- The value is displayed correctly only with r0899.2 = 1 (Operation enabled).

**Speed pre-control signal**

- Speed controller pre-control active From speed control configuration p1400.7
- 1 = Speed pre-control for balancing From the speed control configuration p1400.10
- Only for encoder:
  - p1400.10 = 1 is recommended if a torque pre-control signal is also connected at [5060] in addition to the speed pre-control signal.
  - The interpolator is only effective for clock-cycle synchronous PROFIdrive operation and sign-of-life received from the master (STW2.12...STW2.15).
  - For a 1/0 edge from control command STW2.8 "travel to fixed stop" [2444] the output of all filters is set to the input value for an instantaneous response to a change of the speed setpoint sign.
  - The value is displayed correctly only with r0899.2 = 1 (Operation enabled).

**Setpoint filter**

- Low-pass, 2nd order: Detailed representation at [1024].
- General 2nd-order filter: Detailed representation at [1024].
- Only for encoder: p1400.10 = 1 is recommended if a torque pre-control signal is also connected at [5060] in addition to the speed pre-control signal.
- The interpolator is only effective for clock-cycle synchronous PROFIdrive operation and sign-of-life received from the master (STW2.12...STW2.15).
- For a 1/0 edge from control command STW2.8 "travel to fixed stop" [2444] the output of all filters is set to the input value for an instantaneous response to a change of the speed setpoint sign.
- The value is displayed correctly only with r0899.2 = 1 (Operation enabled).
Servo control - Reference model/pre-control balancing/speed limitation

Emulating the P-controlled speed control loop

Reference model

n_set after filter

Reference model speed setpoint

I component p1400.3

n_set via PC

Steady-state setpoint calculation

PcCtrl active

r1087

n_set via PC

<1> Only if control priority is with control panel with speed setpoint input.

Sampling time, speed control

n_ctrlRefMod D

0.00...5.000

p1434[D](1.000)

r1436

RefMod v_set outp

250.00 μs

r1438

To speed controller [5040.1]

To V/f control [5300.1]

From setpoint limiting [3050.8] [3095.7]

n_limit pos eff r1084

n_limit neg eff r1087

r1439

To speed controller [5040.1]

n_set I_comp

r1439

To speed controller [5040.1]

n_limit pos eff r1084

n_limit neg eff r1087

r1084

n_set via PC

<1> Only if control priority is with control panel with speed setpoint input.

From setpoint limiting [3050.8] [3095.7]

n_limit pos eff r1084

n_limit neg eff r1087

r1438

To speed controller [5040.1]

To V/f control [5300.1]

r1084

n_set via PC

<1> Only if control priority is with control panel with speed setpoint input.

From setpoint limiting [3050.8] [3095.7]

n_limit pos eff r1084

n_limit neg eff r1087

n_set via PC

<1> Only if control priority is with control panel with speed setpoint input.

r1084

n_set via PC

<1> Only if control priority is with control panel with speed setpoint input.

From setpoint limiting [3050.8] [3095.7]

n_limit pos eff r1084

n_limit neg eff r1087

n_set via PC

<1> Only if control priority is with control panel with speed setpoint input.

From setpoint limiting [3050.8] [3095.7]

n_limit pos eff r1084

n_limit neg eff r1087

n_set via PC

<1> Only if control priority is with control panel with speed setpoint input.

From setpoint limiting [3050.8] [3095.7]

n_limit pos eff r1084

n_limit neg eff r1087

n_set via PC

<1> Only if control priority is with control panel with speed setpoint input.

From setpoint limiting [3050.8] [3095.7]

n_limit pos eff r1084

n_limit neg eff r1087

n_set via PC

<1> Only if control priority is with control panel with speed setpoint input.

From setpoint limiting [3050.8] [3095.7]

n_limit pos eff r1084

n_limit neg eff r1087

n_set via PC

<1> Only if control priority is with control panel with speed setpoint input.

From setpoint limiting [3050.8] [3095.7]

n_limit pos eff r1084

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From setpoint limiting [3050.8] [3095.7]

n_limit pos eff r1084

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n_set via PC

<1> Only if control priority is with control panel with speed setpoint input.

From setpoint limiting [3050.8] [3095.7]

n_limit pos eff r1084

n_limit neg eff r1087

n_set via PC

<1> Only if control priority is with control panel with speed setpoint input.
Fig. 2-128  5040 – Speed controller with encoder

1 = Kp/Tn adaptation active
p1400.5
[5030.8]

n_ctrl n_set
p1438

n_set for I component
r1439

[5030.8]

Enable speed controller from sequence control S4: Operation
n_ctrl integ stop
p1476[C]
(0)

n_ctrl integ set
p1477[C]
(0)

n_ctrl integ stop
p1476[C]
(0)

n_ctrl integ set
p1477[C]
(0)

<1> For p1462 = 0.0, the I component is disabled (integral time = ).
<2> For torque control, the I component is set to the value of r1515 (total supplementary torque).
<3> This parameter is set to 0 when pulses are canceled.
<4> The integrator of the speed controller is re-parameterized to become a PT1 filter through a feedback element (p1494).

Kp

Tn

Set
Hold Set Val

Integrator control

Uq at the limit of the ZSW current control
p1488.5
[2530.7]

Torque limit reached
p1407.7
[2522.7]

Speed controller, I component held
p1407.5
[2522.3]

Speed controller, I component set
p1407.6
[2522.3]
Function diagram

Fig. 2-129 5042 – Speed controller, torque/speed pre-control with encoder (p1402.4 = 1)

- 5042 -

Servo control - Speed controller, M/n pre-control with encoder (p1402.4 = 1)

- 5042 -

DO: SERVO

Servo control - Speed controller, M/n pre-control with encoder (p1402.4 = 1)
**Free Kp_n adaptation**

- Adapt_factor upper
  - 0.0...200 000.0 [%]
  - p1459(D) (100.0)

- Adapt_factor lower
  - 0.0...200 000.0 [%]
  - p1458(D) (100.0)

**Speed-dependent Kp_n/Tn_n adaptation**

- Kp_n adaptation factor
  - 1.00 with factory setting

- Kp_n_adapt
  - To the speed controller without encoder
    - [5210.3]

- Kp_n_basic (p1460)

- n_ctrl Kp scal
  - p1466(C)

- Adapt_factor upper
  - 0.0...210 000.00 [rpm]
  - p1466(D) (0.00)

- Adapt_factor lower
  - 0.0...210 000.00 [rpm]
  - p1465(D) (0.00)

- p1461(D) (100 %)

- Kp

- n_ctrl Adpt_sig Kp
  - p1455(C)

- p1463 [4710.6]

- n_act smooth

- Kp_n_basic (p1462)

- 0.00...400.00 [%]
  - p1456(D) (0.00)

- Kp

- n_ctrl Adpt_sig Kp
  - p1455(C)

- p1463 [4710.6]

- n_act smooth

- Kp_n_basic (p1462)

- 0.00...400.00 [%]
  - p1457(D) (0.00)

- Kp

- n_ctrl Adpt_sig Kp
  - p1455(C)

- p1463 [4710.6]

- n_act smooth

- Kp_n_basic (p1462)

- 0.00...400.00 [%]
  - p1458(D) (0.00)

- Kp

- n_ctrl Adpt_sig Kp
  - p1455(C)

- p1463 [4710.6]

- n_act smooth

- Kp_n_basic (p1462)

- 0.00...400.00 [%]
  - p1459(D) (100.0)

- Kp

- n_ctrl Adpt_sig Kp
  - p1455(C)

- p1463 [4710.6]

- n_act smooth

- Kp_n_basic (p1462)

- 0.00...400.00 [%]
  - p1460(D) (100.0)

- Kp

- n_ctrl Adpt_sig Kp
  - p1455(C)

- p1463 [4710.6]

- n_act smooth

- Kp_n_basic (p1462)

- 0.00...400.00 [%]
  - p1461(D) (100 %)

- Kp

- n_ctrl Adpt_sig Kp
  - p1455(C)

- p1463 [4710.6]

- n_act smooth

- Kp_n_basic (p1462)

- 0.00...400.00 [%]
  - p1462(D) (0.00)

- Kp

- n_ctrl Adpt_sig Kp
  - p1455(C)

- p1463 [4710.6]

- n_act smooth

- Kp_n_basic (p1462)

- 0.00...400.00 [%]
  - p1463(D) (100 %)

- Kp

- n_ctrl Adpt_sig Kp
  - p1455(C)

- p1463 [4710.6]

- n_act smooth

- Kp_n_basic (p1462)

- 0.00...400.00 [%]
  - p1464(D) (0.00)

- Kp

- n_ctrl Adpt_sig Kp
  - p1455(C)

- p1463 [4710.6]

- n_act smooth

- Kp_n_basic (p1462)

- 0.00...400.00 [%]
  - p1465(D) (0.00)

- Kp

- n_ctrl Adpt_sig Kp
  - p1455(C)

- p1463 [4710.6]

- n_act smooth

- Kp_n_basic (p1462)

- 0.00...400.00 [%]
  - p1466(D) (0.00)

- Kp

- n_ctrl Adpt_sig Kp
  - p1455(C)

- p1463 [4710.6]

- n_act smooth

- Kp_n_basic (p1462)
Fig. 2-131  5060 – Torque setpoint, control type changeover

1. Torque control can only be activated for operation with encoder.
   A related message is output if:
   1) Sensorless operation is active and closed-loop torque control is requested (r1406.12 = 0 → 1).
   2) Torque control is active and n_act smooth > p1404.
2. Automatic changeover to sensorless operation (e.g. for extremely high-speed spindle drives).
3. When the pulses are canceled, r1509 is set to 0.
4. Only if control priority is with control panel with speed setpoint input.
Servo control - Speed controller without encoder

1 = Sensorless operation speed actual value, starting value
From speed control, configuration p1400.11

1 = Kp_n adaptation factor [5050.6]
(= 1.00 for the factory setting)

For p1472 = 0 the I component is disabled (Integral time = ∞).

Wiring Diagram

1) Setting rule: p0341, p0342 and p1498 must be set correctly.
2) The integrator of the speed controller is re-parameterized to become a PT1 filter through a feedback element (p1494).

DO: SERVO

Function diagram

Servo control - Speed controller without encoder

fp_5210_98_eng.vsd

17.07.09 V04.04.00

SINAMICS S110
Function diagrams

Servo control - V/f control

### V/f Characteristic

- **V/f Characteristic**:
  - $V_f \text{ at } f=0 \text{ Hz}$
  - $U_q = 0.0 \text{...} 10,000.0 \text{ [V]}$
  - $V_f = 0.0 \text{...} 10,000.0 \text{ [Hz]}$
  - For $p1326 = 0$, limit at $0.95 \times f_{Mot.N} \leq 45 \text{ Hz}$.
  - Max. ramp steepness is also influenced by Vdc controller ($p1240 = 0$).

### V/f Resonance Damping

- **V/f Resonance Damping**: $f_{outp}$
  - For $p1349 = 0$, limit at $0.95 \times f_{Mot.N} \leq 45 \text{ Hz}$.
  - Max. ramp steepness is also influenced by Vdc controller ($p1240 = 0$).

### Monitoring

- **Monitoring**: $F07801$ "Motor overcurrent" (No automatic current limiting for V/f control)

### Parameters

- **Pole pair number $p$**: $r0313[M]$
- **V/f U at f=0 Hz**: $p1327[D] (0.0)$
- **V/f T res damp**: $p1339 (20.00)$
- **V/f Gain res damp**: $p1338 (1.00)$
- **Safety ramp-function generator for V/f control (as stall protection)**
- **V/f gain res damp**: $p1338 (1.00)$
- **V/f T res damp**: $p1339 (20.00)$

---

**Table: Function Diagrams**

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>DO: SERVO</td>
<td>fp_5300_98_eng.vsd</td>
<td>Function diagram</td>
<td>30.09.11</td>
<td>V04.04.00</td>
<td>SINAMICS S120</td>
<td>- 5300 -</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**

- 1: The changeover to V/f control is represented at $[5730.1]$.
- 2: For $p1349 = 0$, limit at $0.95 \times f_{Mot.N} \leq 45 \text{ Hz}$.
- 3: Max. ramp steepness is also influenced by Vdc controller ($p1240 = 0$).
5301 – Signaling function variable

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Fig. 2-134

p3299 (4.000 ms)

p3291(0) Var sig S_src

Var sig S_src
p3291
(0)

Activate function
p3290.0

1

Car sig S_src addr
p3292

0

Comparison with sign
p3290.1

0

1

1

0

Var sig thresh_val
p3295

Var sig hyst
p3296

1

t
exceed

1
Contents of
data register

0

Var sig outp_sig
fall below

fall below

r3294

Var sig S_src type
p3293

3

4

5

6
fp_5301_98_eng.vsd
14.09.09 V04.04.00

7
Function diagram
SINAMICS S110

8
- 5301 -

Servo control

2-901

1
2
DO: SERVO
Servo control - Signaling function variable

Var sig t_dropout
p3298

Function diagrams

Var sig t_pickup
p3297


### Function diagram

**SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3**

#### Fig. 2-135 5490 – Speed control configuration

**Meaning**

<table>
<thead>
<tr>
<th>Bit No.</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Reserved</td>
</tr>
<tr>
<td>1</td>
<td>Reserved</td>
</tr>
<tr>
<td>2</td>
<td>Reserved</td>
</tr>
<tr>
<td>3</td>
<td>Reference model speed setpoint I component</td>
</tr>
<tr>
<td>4</td>
<td>1 = Torque limiting active in motoring/regenerating mode</td>
</tr>
<tr>
<td>5</td>
<td>1 = Kp/Tn adaptation active</td>
</tr>
<tr>
<td>6</td>
<td>Reserved</td>
</tr>
<tr>
<td>7</td>
<td>1 = Interpolation, speed pre-control active</td>
</tr>
<tr>
<td>8</td>
<td>1 = Interpolation, torque setpoint active</td>
</tr>
<tr>
<td>9</td>
<td>1 = Damping for sensorless open-loop controlled mode</td>
</tr>
<tr>
<td>10</td>
<td>Speed pre-control</td>
</tr>
<tr>
<td>11</td>
<td>Sensorless operation, speed actual value starting value</td>
</tr>
<tr>
<td>12</td>
<td>Sensorless operation, changeover</td>
</tr>
<tr>
<td>13</td>
<td>Motoring/regenerating mode depending on:</td>
</tr>
<tr>
<td>14</td>
<td>Reserved</td>
</tr>
<tr>
<td>15</td>
<td>Reserved</td>
</tr>
</tbody>
</table>

#### Table

<table>
<thead>
<tr>
<th>Bit No.</th>
<th>Meaning</th>
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<tbody>
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<td>0</td>
<td>Reserved</td>
</tr>
<tr>
<td>1</td>
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<td>13</td>
<td>Reserved</td>
</tr>
<tr>
<td>14</td>
<td>Reserved</td>
</tr>
<tr>
<td>15</td>
<td>Reserved</td>
</tr>
</tbody>
</table>

**Factory setting**

- p1400[D] = 1000.00 μs
- n_ctrl config

**DO: SERVO**

- 5490_98_eng.vsd

**Servo control - Speed control configuration**

- 27.10.08 V04.04.00

**Function diagram**

- SINAMICS S110
<1> As for torque reduction (e.g. for "Travel to fixed stop (TfS)" with process data MOMRED), refer to PROFIdrive telegrams 102 und 103 [2420].
Motoring torque limit

For p1400.4 = 1, the first torque limit applies for motoring operation and the other for regenerative operation, independently of the sign of the torque and the speed (compatible with SIMODRIVE).

"Normal case": If neither dynamic limits nor offsets are required, the torque limit when motoring is entered via p1520. The torque limit when regenerating is entered via p1521 (as a negative value).

Regenerating torque limit

For the manufacturer-specific PROFIdrive telegrams 102 und 103, r1543 is entered here [5610.4].

With p1400.13 = 0, the following applies: if n_act < p1546, the motor limit is effective. With p1400.13 = 1, the following applies: if n_set = 0, the regenerative limit is effective.
For p1400.4 = 0 the torque limits for the positive and negative torque direction (upwards and downwards) are compatible with MASTERDRIVES and MICROMASTER 4.

"Normal case": If neither dynamic limits nor offsets are required, the upper torque limit is entered via p1520 and the lower via p1521 (as a negative value).

Example: 0 = Quick stop activated (OFF:3)

Danger: Negative values at A or positive values at B represent a minimum torque for the other torque direction and can cause the motor to accelerate uncontrollably.

The limiter ensures that the limits do not mutually "overtake" one another. With A < B, Fault F07090 is initiated, which can also be disabled.

For the manufacturer-specific PROFIdrive telegrams 102 und 103, r1543 is switched in here [5640.1].
Mode changeover

From "upper/lower torque limits" [5630.8]

From "motoring/regenerating torque limits" [5620.8]

Power limiting

n_act smooth [4710.6]

P_max mot 0.00...10 000.00 [kW]
p1530 (100.00)

P_max gen -10 000.00...0.00 [kW]
p1531 (100.00)

M_max_1

M_min_1

M_max_2

M_min_2

Min

P_max

M_limit Vdc_max

M_limit Vdc_min

Current limiting

Iq_max_1

Iq_min_1

Min

M_limit Vdc_max

M_limit Vdc_min

Min

fp_5640_98_eng.vsd
Fig. 2-140  5650 – Vdc_max controller and Vdc_min controller

**Vdc_max controller**

- Vdc_upperThresh: p1240
- Vdc_ctrl Kp: p1250
- M_max offset: p1532
- Logic

**Vdc_min controller**

- Vdc_lowerThresh: p1248
- Vdc_ctrl Kp: p1250
- M_min offset: p1532
- Logic

**Logic**

- Adaptation
- M_max: p1530
- M_min: p1530
- Logic

**Adaptation**

- M_max offset: p1532
- M_min offset: p1532
- Logic

**Logic**

- Inhib Vdc ctrl
- Enables Vdc_max controller
- Enables Vdc_min controller
- Enables Vdc_max controller without braking
- Enables Vdc_min controller without braking

**Function Diagrams**

- 5650 - Vdc_max controller and Vdc_min controller
- Function diagram: fp_5650_98_eng.vsd
- SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3

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Fig. 2-141 5710 – Current setpoint filter

M_set_6
[5610.8]
M2iq torque factor
[5730.4]

I before setpoint filter from function generator

M after setpoint filter from function generator

M_set FG
r1651

250.00 μs

I_after_setpoint filter = active

Iq_set_2
[5714.1]

Filter 1

Filter 2

<1> General 2nd-order filter (detailed representation at [1022]).

<2> PT2 low pass (detailed representation at [1022]).

<3> For p1699 = 1, the parameter settings are transferred to the controller.

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>DO: SERVO</td>
<td>fp_5710_98_eng.vsd</td>
<td>Function diagram</td>
<td>08.12.10 V04.04.00 SINAMICS S110</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Fig. 2-142  5714 – Iq and Id controller

Iq controller

Kp_I  Tn_I

Kp_I adaptation

Uq_set_1

Uq pre-control

Uq_set_1

Uq pre-control

Id controller

Kp_I  Tn_I

Current controller adaptation active

<1> F07410 is output if \( I_{\text{act}} = 0 \) and \( U_{q\_set\_1} \) is at the limit for more than 16 ms.

<1> F07410 "Current controller output limited"

DO: SERVO

Servo control - Iq and Id controller

fp_5714_98_eng.vsd

Function diagram

SINAMICS S110
Fig. 2-143 5722 – Field current/flux input, flux reduction, flux controller

- Function diagram
- Only for synchronous motor with reluctance torque
- DO: SERVO
- Servo control - Field current/flux input, flux reduction, flux controller

**Mot phi_load opt**

- Field current setpoint for synchronous motor
- Speed at the start of field weakening
- Short-circuit current $I_{sc}$

**Mot n_field weaken**

- Field current limiting
- Motor data

**p0320[M]**

- $I_{mag \_rated}^{\text{Act}}$
- $r_{0331}$

**p0348[M]**

- $n_{IF}$
- $I_{q \_max \_total}$

**p0640[D]**

- Current limit
- $p_{0323}[M]$ 

**Id_set**

- $[5714.4]$ 

**mot n_field weaken**

- $p_{0327}[M]$ 

- $i_{max \_PM}[5730.4]$ 

- $0.9$

**Kp, Tn**

- Flux controller

- Motor model

**Pre-control**

- Level Id set

**Id_set_1**

- $[2530.7]$ 

**Id_set_2**

- $[2530.7]$ 

**Id_set_3**

- $[2530.7]$ 

**r0075**

- $I_{q \_act}$

**p1578**

- Flux reduc do

**p1579**

- Flux reduc factor

**p1580**

- Flux reduc up

**p1581**

- Limit $I_{q \_set}$

**r1408.9**

- $r_{0067}$

**r0382**

- $r_{0382}$

**r0077**

- $I_{q \_act}$

**Kp**

- $p_{1590}[D]$ 

**Tn**

- $p_{1592}[D]$ 

**r0084**

- Flux actual value [%] from /g307n

**r0083**

- Flux setpoint [%] from /g307n

- $\leq 1$

**r0348**

- Field current limiting

**p0331**

- Motor model

**Mot L_H tr/Lhd ges**

- $0.9$

**-1**

** preval**
Function diagram 8

1. Coordinate converter and transformation
   \[ K \]

2. Motor model
   \[ \text{M}\_\text{act smooth} \]

3. Modulator depth
   \[ \text{r0066} \]

4. DC link voltage
   \[ 250.00 \mu s \]

5. Pulse enable via hardware
   \[ \text{Vf diagn act} \]

6. PM-I/F: Power Module Interface

7. Power Module
   \[ \text{PWM} \]

8. DO: SERVO
   \[ \text{fp}_5730_{98\_eng.vsd} \]

Function diagrams

Servo control - Interface to the Power Module (gating signals, current actual values)
## 2.16 Technology functions

### Function diagrams

<table>
<thead>
<tr>
<th>Function Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>7014 – External Armature Short-Circuit (EASC, p0300 = 2xx or 4xx)</td>
<td>2-913</td>
</tr>
<tr>
<td>7017 – DC brake (p0300 = 1xx)</td>
<td>2-914</td>
</tr>
</tbody>
</table>
Fig. 2-145  
7014 – External Armature Short-Circuit (EASC, p0300 = 2xx or 4xx)

**EASC: External Armature Short-Circuit**

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>DO: SERVO</td>
<td>fp_7014_98_eng.vsd</td>
<td>Function diagram</td>
<td>- 7014 -</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Technology functions - External Armature Short-Circuit (EASC, p0300 = 2xx or 4xx)  
26.11.10  V04.04.00  SINAMICS S110
**Technology functions - DC braking (p0300 = 1xx)**

1. **DO: SERVO**
2. **Technology functions - DC braking (p0300 = 1xx)**
3. **Function diagrams**

---

**DO: SERVO**

1. **Technology functions - DC braking (p0300 = 1xx)**
2. **Function diagrams**

---

2. **The DC braking current is determined during automatic calculation (p0340 = 1).**
3. **The demagnetization time is determined during automatic calculation (p0340 = 3).**
4. **The demagnetization time is only set while the DC braking is active.**
5. **DC braking upon falling below the starting speed for DC braking (p1234).**

---

- **p0340** - DC braking fault response
- **p0344** - DC braking time
- **p0347** - DC braking current
- **p1230** - ASC/DCBRK act
- **p1231** - ASC/DCBRK config
- **p1232** - Pulse inhibit
- **p1233** - DC braking ready
- **p1234** - ASC/DCBRK act

---

**Fig. 2-146 DCB - DC brake (p0300 = 1xx)**
### 2.17 Free function blocks (FBLOCKS)

#### Function diagrams

<table>
<thead>
<tr>
<th>FB Block Type</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>7200 – General information</td>
<td>2-916</td>
</tr>
<tr>
<td>7210 – AND (AND function block with 4 inputs)</td>
<td>2-917</td>
</tr>
<tr>
<td>7212 – OR (OR function block with 4 inputs)</td>
<td>2-918</td>
</tr>
<tr>
<td>7214 – XOR (XOR function block with 4 inputs)</td>
<td>2-919</td>
</tr>
<tr>
<td>7216 – NOT (inverter)</td>
<td>2-920</td>
</tr>
<tr>
<td>7220 – ADD (adder with 4 inputs), SUB (subtracter)</td>
<td>2-921</td>
</tr>
<tr>
<td>7222 – MUL (multiplier), DIV (divider)</td>
<td>2-922</td>
</tr>
<tr>
<td>7224 – AVA (absolute value generator)</td>
<td>2-923</td>
</tr>
<tr>
<td>7230 – MFP (pulse generator), PCL (pulse contractor)</td>
<td>2-924</td>
</tr>
<tr>
<td>7232 – PDE (ON delay), PDF (OFF delay)</td>
<td>2-925</td>
</tr>
<tr>
<td>7234 – PST (pulse stretcher)</td>
<td>2-926</td>
</tr>
<tr>
<td>7240 – RSR (RS flip-flop), DFR (D flip-flop)</td>
<td>2-927</td>
</tr>
<tr>
<td>7250 – BSW (binary switch), NSW (numeric switch)</td>
<td>2-928</td>
</tr>
<tr>
<td>7260 – LIM (limiter)</td>
<td>2-929</td>
</tr>
<tr>
<td>7262 – PT1 (smoothing element)</td>
<td>2-930</td>
</tr>
<tr>
<td>7264 – INT (integrator), DIF (derivative-action element)</td>
<td>2-931</td>
</tr>
<tr>
<td>7270 – LVM (double-sided limit monitor with hysteresis)</td>
<td>2-932</td>
</tr>
</tbody>
</table>
<1> The "free function blocks" function is activated in a drive object via p0108[DO_No].18 = 1 (bit 18 = 1, corresponds to 40000 hex).

<2> The run-time group that belongs to a function block is entered; for every function block, in the particular parameter for the run-time group (e.g. p20032 for AND 0 to [7210]).

<table>
<thead>
<tr>
<th>Run-time group</th>
<th>Run-time group property</th>
<th>Run-time group sampling time</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>p20000[0]</td>
<td>r20001[0]</td>
</tr>
<tr>
<td>1</td>
<td>p20000[1]</td>
<td>r20001[1]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9999</td>
<td></td>
<td>Function block is not calculated</td>
</tr>
</tbody>
</table>
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Fig. 2-148 7210 – AND (AND function block with 4 inputs)

Logic function blocks

AND 0
AND 0 run-time group p20032 (9999)
AND 0 input I0 p20030[0]
AND 0 input I1 p20030[1]
AND 0 input I2 p20030[2]
AND 0 input I3 p20030[3]
AND 0 output Q p20031
AND 0 run sequence p20033 (10)

AND 1
AND 1 run-time group p20036 (9999)
AND 1 input I0 p20034[0]
AND 1 input I1 p20034[1]
AND 1 input I2 p20034[2]
AND 1 input I3 p20034[3]
AND 1 output Q p20035
AND 1 run sequence p20037 (20)

AND 2
AND 2 run-time group p20040 (9999)
AND 2 input I0 p20038[0]
AND 2 input I1 p20038[1]
AND 2 input I2 p20038[2]
AND 2 input I3 p20038[3]
AND 2 output Q p20039
AND 2 run sequence p20041 (30)

AND 3
AND 3 run-time group p20044 (9999)
AND 3 input I0 p20042[0]
AND 3 input I1 p20042[1]
AND 3 input I2 p20042[2]
AND 3 input I3 p20042[3]
AND 3 output Q p20043
AND 3 run sequence p20045 (40)
Fig. 2-149  7212 – OR (OR function block with 4 inputs)

**OR 0**

- OR 0 run-time group p20048 (9999)
- OR 0 run sequence p20049 (60)
- OR 0 input I0 p20046[0]
- OR 0 input I1 p20046[1]
- OR 0 input I2 p20046[2]
- OR 0 input I3 p20046[3]
- OR 0 output Q r20047

**OR 1**

- OR 1 run-time group p20052 (9999)
- OR 1 run sequence p20053 (70)
- OR 1 input I0 p20050[0]
- OR 1 input I1 p20050[1]
- OR 1 input I2 p20050[2]
- OR 1 input I3 p20050[3]
- OR 1 output Q r20051

**OR 2**

- OR 2 run-time group p20056 (9999)
- OR 2 run sequence p20057 (80)
- OR 2 input I0 p20054[0]
- OR 2 input I1 p20054[1]
- OR 2 input I2 p20054[2]
- OR 2 input I3 p20054[3]
- OR 2 output Q r20055

**OR 3**

- OR 3 run-time group p20060 (9999)
- OR 3 run sequence p20061 (90)
- OR 3 input I0 p20058[0]
- OR 3 input I1 p20058[1]
- OR 3 input I2 p20058[2]
- OR 3 input I3 p20058[3]
- OR 3 output Q r20059

**Logic function blocks**

**Free function blocks (FBLOCKS)**
XOR 0
XOR 0 run-time group p20064 (9999)
XOR run sequence p20065 (110)
XOR 0 input I0 p20062[0]
XOR 0 input I1 p20062[1]
XOR 0 input I2 p20062[2]
XOR 0 input I3 p20062[3]
XOR 0 output Q

DO: All Objects
FBLOCKS - XOR (XOR function block with 4 inputs)
SINAMICS S110
**Fig. 2-151** 7216 – NOT (inverter)

### Logic function blocks

**NOT 0**
- NOT 0 run-time group: p20080 (9999)
- NOT 0 run sequence: p20081 (160)
- NOT 0 input I: p20078 (0)
- NOT 0 Inv output: p20079

**NOT 1**
- NOT 1 run-time group: p20084 (9999)
- NOT 1 run sequence: p20085 (170)
- NOT 1 input I: p20082 (0)
- NOT 1 Inv output: p20083

**NOT 2**
- NOT 2 run-time group: p20088 (9999)
- NOT 2 run sequence: p20089 (180)
- NOT 2 input I: p20086 (0)
- NOT 2 Inv output: p20087

**NOT 3**
- NOT 3 run-time group: p20092 (9999)
- NOT 3 run sequence: p20093 (190)
- NOT 3 input I: p20090 (0)
- NOT 3 Inv output: p20091
ADD 0

ADD 0 run-time group
p20096 (9999)

ADD 0 input X0
p20094[0] (0)
ADD 0 input X1
p20094[1] (0)
ADD 0 input X2
p20094[2] (0)
ADD 0 input X3
p20094[3] (0)

ADD 0 output Y
p20095

ADD 0 run sequence
p20097 (210)

ADD 1

ADD 1 run-time group
p20100 (9999)

ADD 1 input X0
p20098[0] (0)
ADD 1 input X1
p20098[1] (0)
ADD 1 input X2
p20098[2] (0)
ADD 1 input X3
p20098[3] (0)

ADD 1 output Y
p20096

ADD 1 run sequence
p20101 (220)

SUB 0

SUB 0 run-time group
p20104 (9999)

SUB 0 minuend X1
p20102[0] (0)
SUB 0 subtrahend X2
p20102[1] (0)

SUB 0 difference Y
p20103

SUB 0 run sequence
p20105 (240)

SUB 1

SUB 1 run-time group
p20108 (9999)

SUB 1 minuend X1
p20106[0] (0)
SUB 1 subtrahend X2
p20106[1] (0)

SUB 1 difference Y
p20107

SUB 1 run sequence
p20109 (250)

DO: All Objects

FBLOCKS - ADD (adder with 4 inputs), SUB (subtractor)

fp_7220_98_eng.vsd
Function diagram
SINAMICS S110
20.04.09 V04.04.00
Fig. 2-153

**Function diagram**

**FBLOCKS - MUL (multiplier), DIV (divider)**

1. **DO: All Objects**
2. **FBLOCKS - MUL (multiplier), DIV (divider)**
3. **MUL 0**
   - **Run-time group**: p20112 (9999)
   - **Run sequence**: p20113 (270)
   - **Factor X0** (0)
     - p20110[0]
   - **Factor X1** (0)
     - p20110[1]
   - **Factor X2** (0)
     - p20110[2]
   - **Factor X3** (0)
     - p20110[3]
4. **MUL 1**
   - **Run-time group**: p20116 (9999)
   - **Run sequence**: p20117 (280)
   - **Factor X0** (0)
     - p20114[0]
   - **Factor X1** (0)
     - p20114[1]
   - **Factor X2** (0)
     - p20114[2]
   - **Factor X3** (0)
     - p20114[3]
5. **DIV 0**
   - **Run-time group**: p20121 (9999)
   - **Run sequence**: p20122 (300)
   - **Dividend X0**
     - p20118[0]
   - **Divisor X1**
     - p20118[1]
   - **Quotient Y**
     - p20119[0]
   - **Multiple integer quotient**
     - p20124[0]
   - **Division remainder**
     - p20124[1]
   - **Quotient Y**
     - p20124[2]
6. **DIV 1**
   - **Run-time group**: p20126 (9999)
   - **Run sequence**: p20127 (310)
   - **Dividend X0**
     - p20123[0]
   - **Divisor X1**
     - p20123[1]
   - **Quotient Y**
     - p20124[0]
   - **Multiple integer quotient**
     - p20124[1]
   - **Division remainder**
     - p20124[2]

**Arithmetic function blocks**

- **MUL 0**: Product Y
- **MUL 1**: Product Y
- **DIV 0**: Divisor is zero
- **DIV 1**: Divisor is zero
AVA 0
AVA 0 run-time group p20131 (9999)
AVA 0 run sequence p20132 (349)
AVA 0 input negative SN r20130
AVA 0 output Y 20129

AVA 1
AVA 1 run-time group p20136 (9999)
AVA 1 run sequence p20137 (350)
AVA 1 input negative SN r20134
AVA 1 output Y 20134

AVA 0 input X p20128
AVA 1 input X p20131

X

Y

SN
Fig. 2-155  7230 – MFP (pulse generator), PCL (pulse shortener)

DO: All Objects

Function diagram

- MFP 0 run-time group p20138 (9999)
- MFP 0 run sequence p20139 (0.00)
- MFP 1 run-time group p20146 (9999)
- MFP 1 run sequence p20147 (0.00)
- PCL 0 run-time group p20149 (9999)
- PCL 0 run sequence p20150 (0.00)
- PCL 1 run-time group p20156 (9999)
- PCL 1 run sequence p20157 (0.00)

MFP 0 input pulse I p20141
MFP 1 input pulse I p20143
PCL 0 input pulse I p20148
PCL 1 input pulse I p20153

MFP 0 output Q r20140
MFP 1 output Q r20145
PCL 0 output Q r20151
PCL 1 output Q r20155

MFP 0 pulse duration in ms 0.00...60000.00 p20139 (0.00)
MFP 1 pulse duration in ms 0.00...60000.00 p20144 (0.00)
PCL 0 pulse duration in ms 0.00...60000.00 p20149 (0.00)
PCL 1 pulse duration in ms 0.00...60000.00 p20154 (0.00)

Time function blocks
Free function blocks (FBLOCKS)

Function diagrams

Fig. 2-156 7232 – PDE (ON delay), PDF (OFF delay)

PDE 0
- PDE 0 pulse delay time in ms
  0.00...60000.00
  p20159 (0.00)
- PDE 0 input pulse I
  p20158
- PDE 0 output Q
  p20160
- PDE 0 run-time group
  p20161 (9999)
- PDE 0 run sequence
  p20162 (430)

PDE 1
- PDE 1 pulse delay time in ms
  0.00...60000.00
  p20164 (0.00)
- PDE 1 input pulse I
  p20163
- PDE 1 output Q
  p20165
- PDE 1 run-time group
  p20166 (9999)
- PDE 1 run sequence
  p20167 (440)

PDF 0
- PDF 0 pulse extension time in ms
  0.00...60000.00
  p20169 (0.00)
- PDF 0 input pulse I
  p20168
- PDF 0 output Q
  p20170
- PDF 0 run-time group
  p20171 (9999)
- PDF 0 run sequence
  p20172 (460)

PDF 1
- PDF 1 pulse extension time in ms
  0.00...60000.00
  p20174 (0.00)
- PDF 1 input pulse I
  p20173
- PDF 1 output Q
  p20175
- PDF 1 run-time group
  p20176 (9999)
- PDF 1 run sequence
  p20177 (470)

DO: All Objects
FBLOCKS - PDE (switch-in delay), PDF (switch-out delay)

Function diagram
fp_7232_98_eng.vsd
06.12.11 V04.04.00
SINAMICS S110

- 7232 -
**Function diagrams**

**Free function blocks (FBLOCKS)**

---

**Fig. 2-157** 7234 – PST (pulse stretcher)

---

**Time function blocks**

**PST 0**
- PST 0 pulse duration in ms
  - p20179 (0.00)
- PST 0 run-time group
  - p20181 (9999)
- PST 0 input pulse I
  - p20178[0]
- PST 0 reset input R
  - p20178[1]
- PST 0 run sequence
  - p20182 (495)
- PST 0 output Q
  - r20180

**PST 1**
- PST 1 pulse duration in ms
  - p20184 (0.00)
- PST 1 run-time group
  - p20186 (9999)
- PST 1 input pulse I
  - p20183[0]
- PST 1 reset input R
  - p20183[1]
- PST 1 run sequence
  - p20187 (500)
- PST 1 output Q
  - r20185

---

**Table**: DO: All Objects

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>fp_7234_98_eng.vsd</td>
<td>Function diagram</td>
<td></td>
</tr>
<tr>
<td>FBLOCKS - PST (pulse extender)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>06.12.11_V04.04.00</td>
<td>SINAMICS S110</td>
</tr>
</tbody>
</table>
Free function blocks (FBLOCKS)

Function diagrams

Fig. 2-158 7240 – RSR (RS flip-flop), DFR (D flip-flop)
Switch function blocks

**BSW 0**

- BSW 0 run-time group p20212 (580)
- BSW 0 run sequence p20211 (9999)
- BSW 0 input I0 p20208[0]
- BSW 0 input I1 p20208[1]
- BSW 0 output Q r20210
- BSW 0 switch setting I p20209

**BSW 1**

- BSW 1 run-time group p20217 (590)
- BSW 1 run sequence p20216 (9999)
- BSW 1 input I0 p20213[0]
- BSW 1 input I1 p20213[1]
- BSW 1 output Q r20215
- BSW 1 switch setting I p20214

**NSW 0**

- NSW 0 run-time group p20222 (610)
- NSW 0 run sequence p20221 (9999)
- NSW 0 input X0 p20218[0]
- NSW 0 input X1 p20218[1]
- NSW 0 output Y r20220
- NSW 0 switch setting I p20219

**NSW 1**

- NSW 1 run-time group p20227 (620)
- NSW 1 run sequence p20226 (9999)
- NSW 1 input X0 p20223[0]
- NSW 1 input X1 p20223[1]
- NSW 1 output Y r20225
- NSW 1 switch setting I p20224
Basic function blocks

**LIM 0**
- LIM 0 input X: p20228, (0)
- LIM 0 upper limit value LU: p20229, (0.0)
- LIM 0 lower limit value LL: p20230, (0.0)
- LIM 0 run-time group: p20234, (9999)
- LIM 0 run sequence: p20235, (640)
- LIM 0 input at the upper limit QU: r20232
- LIM 0 input at the lower limit QL: r20233
- LIM 0 output Y: X, Y
- LIM 0 upper limit value LU: p20237, (0.0)
- LIM 0 lower limit value LL: p20238, (0.0)

**LIM 1**
- LIM 1 input X: p20236, (0)
- LIM 1 upper limit value LU: p20237, (0.0)
- LIM 1 lower limit value LL: p20238, (0.0)
- LIM 1 run-time group: p20242, (9999)
- LIM 1 run sequence: p20243, (650)
- LIM 1 input at the upper limit QU: r20239
- LIM 1 input at the lower limit QL: r20241
- LIM 1 output Y: X, Y
Fig. 2-161 7262 – PT1 (smoothing element)

PT1 0

PT1 0 smoothing time constant in ms
p20248 (0.0)

PT1 0 run-time group
p20246 (9999)

PT1 0 run sequence
p20249 (670)

PT1 0 input X
p20244[0]

PT1 0 setting value SV
p20244[1]

PT1 0 output Y
p20247

PT1 0 accept setting value S
p20245

PT1 1

PT1 1 smoothing time constant in ms
p20252 (0.0)

PT1 1 run-time group
p20254 (9999)

PT1 1 run sequence
p20255 (680)

PT1 1 input X
p20250[0]

PT1 1 setting value SV
p20250[1]

PT1 1 output Y
p20253

PT1 1 accept setting value S
p20251

Basic function blocks

DO: All Objects

FBLOCKS - PT1 (smoothing element)

Function diagram

fp_7262_98_eng.vsd

SINAMICS S110

- 7262 -
Fig. 2-162  7264 – INT (integrator), DIF (differentiating element)

**INT 0**
- Integrating time constant: \( Y(n) = Y(n-1) + \frac{T_{\text{sample}}}{T_i} \times X(n) \)
- Run-time group: \( p20264 \) (9999)
- Run sequence: \( p20265 \) (700)
- Output: \( Y \)
- Upper limit value: \( LU \) (0)
- Lower limit value: \( LL \) (0)
- Input X: \( p20256[0] \)
- Setting value SV: \( p20256[1] \)
- Accept setting value S: \( p20260 \)

**DIF 0**
- Differentiating time constant: \( Y(n) = (X(n) - X(n-1)) \times \frac{T_D}{T_{\text{sample}}} \)
- Run-time group: \( p20287 \) (9999)
- Run sequence: \( p20288 \) (750)
- Output: \( Y \)
- Input X: \( p20284 \)
- Run-time group: \( p20287 \) (9999)
- Run sequence: \( p20288 \) (750)

---

**Basic function blocks - INT (integrator), DIF (differentiating element)**
- DO: All Objects
- SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3
- Function diagram: fp_7264_98_eng.vsd
- Date: 14.10.09 V04.04.00
2.18 Technology controller

Function diagrams

<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>7950</td>
<td>Fixed values (r0108.16 = 1)</td>
<td>2-934</td>
</tr>
<tr>
<td>7951</td>
<td>Fixed values, direct selection (p2216 = 1)</td>
<td>2-935</td>
</tr>
<tr>
<td>7954</td>
<td>Motorized potentiometer (r0108.16 = 1)</td>
<td>2-936</td>
</tr>
<tr>
<td>7958</td>
<td>Closed-loop control (r0108.16 = 1)</td>
<td>2-937</td>
</tr>
</tbody>
</table>
Fig. 2-164 7950 – Fixed values (r0108.16 = 1)

- Technology controller - Fixed values (r0108.16 = 1 and p2216 = 2)

- The pre-assignment of the sampling time in p0115[{6}] is 4000.00 μs.

- DO: SERVO

- Refer to [1020.7]
The pre-assignment of the sampling time in p0115[6] is 4000.00 μs.

Refer to [1020.7]

The pre-assignment of the sampling time in p0115[6] is 4000.00 μs.

Refer to [1020.7]
The setpoint for the motorized potentiometer is not saved and after ON is entered using p2240.

Without initial rounding,

With initial rounding. The ramp-up/down time set is exceeded accordingly.

The setpoint for the motorized potentiometer is saved after OFF and after ON is entered using r2231.

For p2230.0 = 0, this setpoint is entered after ON.

If initial rounding-off is active (p2230.2 = 1), the selected ramp-up/down times are exceeded accordingly.
Fig. 2-167  7958 – Closed-loop control (r0108.16 = 1)

1. P, I and D components can be disabled by entering a zero.
2. Behavior can be changed via p2252.
3. I component stop, only when r2273 and r2294 in same direction.

- DO: SERVO
  Technology controller - Closed-loop control (r0108.16 = 1)

- Function diagrams
  Designation

- Technology controller limited
  Designation

- Technology controller de-activated
  Designation
<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>8010 – Speed signals 1</td>
<td></td>
<td>2-939</td>
</tr>
<tr>
<td>8011 – Speed signals 2</td>
<td></td>
<td>2-940</td>
</tr>
<tr>
<td>8012 – Torque signals, motor locked/stalled</td>
<td></td>
<td>2-941</td>
</tr>
<tr>
<td>8014 – Thermal monitoring, power unit</td>
<td></td>
<td>2-942</td>
</tr>
<tr>
<td>8016 – Thermal monitoring, motor</td>
<td></td>
<td>2-943</td>
</tr>
</tbody>
</table>
Fig. 2-169  8011 – Speed signals 2

Signals and monitoring functions - Speed signals 2

1  2  3  4  5  6  7  8

<p>| | | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
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</tr>
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<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
</tbody>
</table>

DO: SERVO  fp_8011_98_eng.vsd  Function diagram  SINAMICS S110

Function diagrams

SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3

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Fig. 2-170  8012 - Torque signals, motor locked/stalled

- Torque signals, motor locked/stalled

1. Ramp-up completed
2. Ramp-function generator operating
3. M_set total, smooth
4. M_max Offset
5. M_max upper effective
6. M_max lower effective
7. Torque utilization 
8. Actual torque limit

1. The torque setpoint and the torque limits are determined by p1532 (M_max offset). As a rule, M_max offset = 0.

DO: SERVO

Signals and monitoring functions - Torque signals, motor locked/stalled

fp_8012_98_eng.vsd Function diagram - 8012 -

SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3
Fig. 2-171  
8014 – Thermal monitoring, power unit

Maximum power unit temperature

Faults "power unit overtemperature"  
F30004 inverter heatsink  
F30024 thermal model  
F30025 chip  
F30035 air intake  
F30036 electronics module  
F30037 rectifier

Alarms "power unit overtemperature"  
A05000 inverter heatsink  
A05001 chip  
A05002 air intake  
A05003 electronics module  
A05004 rectifier

Power unit overload  
0...100 %

Alarm threshold  
PT overload power unit  
0...100 %  
p0294 (95 %)

Alarm threshold  
P overload power unit  
0...100 %  
p0294 (95 %)

Power unit overload response  
p0290

A07805 "Power unit overload"  
F30005 "Power unit overload"

Faults "power unit overtemperature"  
F30004 inverter heatsink  
F30024 thermal model  
F30025 chip  
F30035 air intake  
F30036 electronics module  
F30037 rectifier

Alarms "power unit overtemperature"  
A05000 inverter heatsink  
A05001 chip  
A05002 air intake  
A05003 electronics module  
A05004 rectifier

Power unit overload  
0...100 %

Alarm threshold  
P overload power unit  
0...100 %  
p0294 (95 %)

Alarm threshold  
P overload power unit  
0...100 %  
p0294 (95 %)

Power unit overload response  
p0290

A07805 "Power unit overload"  
F30005 "Power unit overload"

Faults "power unit overtemperature"  
F30004 inverter heatsink  
F30024 thermal model  
F30025 chip  
F30035 air intake  
F30036 electronics module  
F30037 rectifier

Alarms "power unit overtemperature"  
A05000 inverter heatsink  
A05001 chip  
A05002 air intake  
A05003 electronics module  
A05004 rectifier

Power unit overload  
0...100 %

Alarm threshold  
P overload power unit  
0...100 %  
p0294 (95 %)

Alarm threshold  
P overload power unit  
0...100 %  
p0294 (95 %)

Power unit overload response  
p0290

A07805 "Power unit overload"  
F30005 "Power unit overload"

Faults "power unit overtemperature"  
F30004 inverter heatsink  
F30024 thermal model  
F30025 chip  
F30035 air intake  
F30036 electronics module  
F30037 rectifier

Alarms "power unit overtemperature"  
A05000 inverter heatsink  
A05001 chip  
A05002 air intake  
A05003 electronics module  
A05004 rectifier

Power unit overload  
0...100 %

Alarm threshold  
P overload power unit  
0...100 %  
p0294 (95 %)

Alarm threshold  
P overload power unit  
0...100 %  
p0294 (95 %)

Power unit overload response  
p0290

A07805 "Power unit overload"  
F30005 "Power unit overload"

Faults "power unit overtemperature"  
F30004 inverter heatsink  
F30024 thermal model  
F30025 chip  
F30035 air intake  
F30036 electronics module  
F30037 rectifier

Alarms "power unit overtemperature"  
A05000 inverter heatsink  
A05001 chip  
A05002 air intake  
A05003 electronics module  
A05004 rectifier

Power unit overload  
0...100 %

Alarm threshold  
P overload power unit  
0...100 %  
p0294 (95 %)

Alarm threshold  
P overload power unit  
0...100 %  
p0294 (95 %)

Power unit overload response  
p0290

A07805 "Power unit overload"  
F30005 "Power unit overload"

Faults "power unit overtemperature"  
F30004 inverter heatsink  
F30024 thermal model  
F30025 chip  
F30035 air intake  
F30036 electronics module  
F30037 rectifier

Alarms "power unit overtemperature"  
A05000 inverter heatsink  
A05001 chip  
A05002 air intake  
A05003 electronics module  
A05004 rectifier

Power unit overload  
0...100 %

Alarm threshold  
P overload power unit  
0...100 %  
p0294 (95 %)

Alarm threshold  
P overload power unit  
0...100 %  
p0294 (95 %)

Power unit overload response  
p0290

A07805 "Power unit overload"  
F30005 "Power unit overload"

Faults "power unit overtemperature"  
F30004 inverter heatsink  
F30024 thermal model  
F30025 chip  
F30035 air intake  
F30036 electronics module  
F30037 rectifier

Alarms "power unit overtemperature"  
A05000 inverter heatsink  
A05001 chip  
A05002 air intake  
A05003 electronics module  
A05004 rectifier

Power unit overload  
0...100 %

Alarm threshold  
P overload power unit  
0...100 %  
p0294 (95 %)

Alarm threshold  
P overload power unit  
0...100 %  
p0294 (95 %)

Power unit overload response  
p0290

A07805 "Power unit overload"  
F30005 "Power unit overload"
Signals and monitoring functions

Function diagram

Fig. 2-172 8016 – Thermal monitoring, motor

Signals and monitoring functions

Function diagrams
## 2.20 Diagnostics

### Function diagrams

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>8060</td>
<td>Fault buffer</td>
<td>2-945</td>
</tr>
<tr>
<td>8065</td>
<td>Alarm buffer</td>
<td>2-946</td>
</tr>
<tr>
<td>8070</td>
<td>Fault/alarm trigger word (r2129)</td>
<td>2-947</td>
</tr>
<tr>
<td>8075</td>
<td>Fault/alarm configuration</td>
<td>2-948</td>
</tr>
<tr>
<td>8134</td>
<td>Measuring sockets</td>
<td>2-949</td>
</tr>
</tbody>
</table>
Fig. 2-173  8060 – Fault buffer

Fault times
Fault code Fault value
Fault time "come" Fault time "removed" Fault Drive Object triggered
Compo. no fault Diag. attr fault

Fault 1
r0845[0] r0948[0][I32]
[2138][Float] r2109[0][ms]
[2136][d]
[2136][d] r3115[0] r3120[0] r3122[0]

Fault 2
r0845[1] r0948[1][I32]
[2133][1][Float] r2109[1][ms]

Fault 8
r0845[8] r0948[8][I32]
[2133][8][Float] r2109[8][ms]

Fault times
Fault code Fault value
Fault time "come" Fault time "removed" Fault Drive Object triggered
Compo. no fault Diag. attr fault

Fault 1
r0845[15] r0948[15][I32]
[2133][15][Float] r2109[15][ms]

Fault 2
r0845[56] r0948[56][I32]
[2133][56][Float] r2109[56][ms]
[2136][d] [2136][d] r3115[56] r3120[56] r3122[56]

Fault 8
r0845[63] r0948[63][I32]
[2133][63][Float] r2109[63][ms]
[2136][d] [2136][d] r3115[63] r3120[63] r3122[63]

<1> This fault is overwritten when "more recent" faults occur (with the exception of "safety faults").
<2> The buffer parameters are cyclically updated in the background (refer to the status signal in r2139).

Fault active
[2139.3] [2548.2]
Fig. 2-174  8065 – Alarm buffer

<table>
<thead>
<tr>
<th>Alarm 1 (oldest)</th>
<th>Alarm 2</th>
<th>Alarm 8 (most recent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>r2122[0]</td>
<td>r2124[0]</td>
<td>r2124[7] ([32] [32] [32])</td>
</tr>
<tr>
<td>r2123[0]</td>
<td>r2145[0]</td>
<td>r2145[7] [d]</td>
</tr>
<tr>
<td>r2125[0]</td>
<td>r2146[0]</td>
<td>r2146[7] [d]</td>
</tr>
<tr>
<td>r3121[0]</td>
<td>r3123[0]</td>
<td>r3123[7]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Alarm 1 (most recent)</th>
<th>Alarm 2</th>
<th>Alarm 56 (oldest)</th>
</tr>
</thead>
<tbody>
<tr>
<td>r2123[8] [ms]</td>
<td>r2145[8] [d]</td>
<td>r2145[63] [d]</td>
</tr>
<tr>
<td>r2125[8] [ms]</td>
<td>r2146[8] [d]</td>
<td>r2146[63] [d]</td>
</tr>
<tr>
<td>r3121[8]</td>
<td>r3123[8]</td>
<td>r3123[63]</td>
</tr>
</tbody>
</table>

<1> The buffer parameters are updated cyclically in the background (see status signal in r2139).

- 8065 -
Fig. 2-175 8070 – Fault/alarm trigger word (r2129)

DO: All objects

Faults and alarms - Fault/alarm trigger word (r2129)

0. Message/signal present
1. Message/signal present
15. Message/signal present

SA select fault/alert code for trigger

Setting fault/alarm trigger

Fault/alarm trigger word (e.g. as trigger condition to record traces)

Faults and alarms - Fault/alarm code

0. Fault/alarm code
1. Fault/alarm code
15. Fault/alarm code

Refer to [1020.7]

Function diagram fp_8070_98_eng.vsd
Changing the fault response for maximum 20 faults <1>

- Fault code
- Fault response
- Fault code
- Fault response
- Fault code
- Fault response

Changing the acknowledge mode for maximum 20 faults <1>

- Fault code
- Acknowledge mode
- Fault code
- Acknowledge mode
- Fault code
- Acknowledge mode

Changing the message type - fault <=> alarm for maximum 20 faults/alarms <1>

- Fault/alarm code
- Fault/alarm type
- Fault/alarm code
- Fault/alarm type
- Fault/alarm code
- Fault/alarm type

<1> The fault response, acknowledge mode and message type for all faults and alarms are set to meaningful default values in the factory setting. Changes that may be required are only possible in specific value ranges specified by SIEMENS. When the message type is changed, the supplementary information is transferred from fault value r0949 to alarm value r2124 and vice versa.

DO: All objects
Faults and alarms - Fault/alarm configuration
fp_8075_98_eng.vsd
Function diagram
- 8075 -
Fig. 2-177 8134 – Measuring sockets

- Measuring sockets

Reference quantities p200x

Limit

Dimension unit per volt r0786[

- Limit

Dimenison unit per volt r0786[1] <4>

<4> Example: If a speed signal is entered via p0771 and r0786 indicates 100.0, a speed change of 100 rpm results in an output voltage change of 1.0 V.

<4> Example: If a speed signal is entered via p0771 and r0786 indicates 100.0, a speed change of 100 rpm results in an output voltage change of 1.0 V.

<3> The input signals are determined by the reference quantities p200x (100 % corresponds to p200x). The calculated normalization is indicated via r0786.

<2> With the factory setting, input values from -100...100 % result in output voltages from 0...4.98 V.

<1> Only for measuring equipment with RI ≥ 1 MΩ.

-4.98...4.98 V

-100 000.00...100 000.00 %

p0779[0] (100.00)

p0779[1] (100.00)

-100 000.00...100 000.00 %

p0777[0] (0.00)

p0777[1] (0.00)

0.00...4.98 V

p0780[0] (4.98)

p0780[1] (4.98)

0.00...4.98 V

p0778[0] (2.49)

p0778[1] (2.49)

0.00...4.98 V

p0784[0] (4.98)

p0784[1] (4.98)

0.00...4.98 V

-100 000.00...100 000.00 %

p0783[0] (0.00)

p0783[1] (0.00)

-4.98...4.98 V

p0781[0] (4.98)

p0781[1] (4.98)

0.00...4.98 V

r0774[0]

r0774[1]

r0772[0]

r0772[1]

x1+100 %

x2

y [%]

y [%]

p0771[0] (0)

p0771[1] (0)

(100 %) x [%]

(100 %) x [%]

(100 %) x [%]

(100 %) x [%]

p0773[0] (0.00)

p0773[1] (0.00)

p0775[0] (0.00)

p0775[1] (0.00)

p0776[0] (0.00)

p0776[1] (0.00)

p0779[0] (100.00)

p0779[1] (100.00)

p0780[0] (4.98)

p0780[1] (4.98)

p0778[0] (2.49)

p0778[1] (2.49)

p0784[0] (4.98)

p0784[1] (4.98)

p0783[0] (0.00)

p0783[1] (0.00)

-100 000.00...100 000.00 %

p0777[0] (0.00)

p0777[1] (0.00)

0.00...4.98 V

p0780[0] (4.98)

p0780[1] (4.98)

0.00...4.98 V

p0778[0] (2.49)

p0778[1] (2.49)

0.00...4.98 V

p0784[0] (4.98)

p0784[1] (4.98)

0.00...4.98 V

p0783[0] (0.00)

p0783[1] (0.00)

-4.98...4.98 V

p0781[0] (4.98)

p0781[1] (4.98)

0.00...4.98 V

r0774[0]

r0774[1]

r0772[0]

r0772[1]

x1+100 %

x2

y [%]

y [%]

p0771[0] (0)

p0771[1] (0)

(100 %) x [%]

(100 %) x [%]

(100 %) x [%]

(100 %) x [%]

p0773[0] (0.00)

p0773[1] (0.00)

p0775[0] (0.00)

p0775[1] (0.00)

p0776[0] (0.00)

p0776[1] (0.00)

p0779[0] (100.00)

p0779[1] (100.00)

p0780[0] (4.98)

p0780[1] (4.98)

p0778[0] (2.49)

p0778[1] (2.49)

p0784[0] (4.98)

p0784[1] (4.98)

p0783[0] (0.00)

p0783[1] (0.00)

-100 000.00...100 000.00 %

p0777[0] (0.00)

p0777[1] (0.00)

0.00...4.98 V

p0780[0] (4.98)

p0780[1] (4.98)

0.00...4.98 V

p0778[0] (2.49)

p0778[1] (2.49)

0.00...4.98 V

p0784[0] (4.98)

p0784[1] (4.98)

0.00...4.98 V

p0783[0] (0.00)

p0783[1] (0.00)

-4.98...4.98 V

p0781[0] (4.98)

p0781[1] (4.98)

0.00...4.98 V

r0774[0]

r0774[1]

r0772[0]

r0772[1]

x1+100 %

x2

y [%]

y [%]

p0771[0] (0)

p0771[1] (0)

(100 %) x [%]

(100 %) x [%]

(100 %) x [%]

(100 %) x [%]

p0773[0] (0.00)

p0773[1] (0.00)

p0775[0] (0.00)

p0775[1] (0.00)

p0776[0] (0.00)

p0776[1] (0.00)

p0779[0] (100.00)

p0779[1] (100.00)

p0780[0] (4.98)

p0780[1] (4.98)

p0778[0] (2.49)

p0778[1] (2.49)

p0784[0] (4.98)

p0784[1] (4.98)

p0783[0] (0.00)

p0783[1] (0.00)

-4.98...4.98 V

p0781[0] (4.98)

p0781[1] (4.98)

0.00...4.98 V

r0774[0]

r0774[1]

r0772[0]

r0772[1]

x1+100 %

x2

y [%]

y [%]
2.21 Data sets

Function diagrams

<table>
<thead>
<tr>
<th>Data Set Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>8560 – Command Data Sets (CDS)</td>
<td>2-951</td>
</tr>
<tr>
<td>8565 – Drive Data Sets (DDS)</td>
<td>2-952</td>
</tr>
<tr>
<td>8570 – Encoder Data Sets (EDS)</td>
<td>2-953</td>
</tr>
<tr>
<td>8575 – Motor Data Sets (MDS)</td>
<td>2-954</td>
</tr>
</tbody>
</table>
Example:
Change over Command Data Set CDS0 --> CDS1

Copy CDS, source p0809[0] (0)
Copy CDS, start p0809[2] (0)
Copy CDS, target p0809[1] (1)

CDS0 selected r0836.0 = 0
CDS1 selected r0836.0 = 1
CDS0 effective r0050.0 = 0
CDS1 effective r0050.0 = 1

BI: p0810 = "0"
CDS0 selected r0836.0 = 0
BI: p0810 = "1"
CDS1 selected r0836.0 = 1

BI: p0810 = "0"
CDS0 selected r0836.0 = 0
BI: p0810 = "1"
CDS1 selected r0836.0 = 1

Drive 1
CDS1
CDS0

<1> Min / Max / Factory setting: 1 / 2 / 2.

Example:
Change over Command Data Set CDS0 --> CDS1

Copy CDS, source p0809[0] (0)
Copy CDS, start p0809[2] (0)
Copy CDS, target p0809[1] (1)

CDS0 selected r0836.0 = 0
CDS1 selected r0836.0 = 1
CDS0 effective r0050.0 = 0
CDS1 effective r0050.0 = 1

BI: p0810 = "0"
CDS0 selected r0836.0 = 0
BI: p0810 = "1"
CDS1 selected r0836.0 = 1

BI: p0810 = "0"
CDS0 selected r0836.0 = 0
BI: p0810 = "1"
CDS1 selected r0836.0 = 1

Drive 1
CDS1
CDS0

<1> Min / Max / Factory setting: 1 / 2 / 2.
Fig. 2-179 8565 – Drive Data Sets (DDS)

DDS (Drive Data Set)

- p0186[0...n] (MDS number)
- p0187[0...n] (Enc 1 EDS number)
- p0188[0...n] (Enc 2 EDS number)

EDS (Encoder Data Set)

MDS (Motor Data Set)

Drive 1

DDS number p0180 (1)

Copy DDS, source p0819[0] (0)
Copy DDS, start p0819[2] (0)
Copy DDS, target p0819[1] (1)

Select DDS bit 0 p0820[0]

DDS1

DDS0

<1> A BICO interconnection to a parameter which is part of a drive data set always influences the currently effective data set.

Not relevant
Refer to [1020.7]

DO: SERVO

Data sets - Drive Data Sets, DDS

fp_8565_98_eng.vsd

Function diagram

- 8565 -
Fig. 2-180 8570 – Encoder Data Sets (EDS)

DDS (Drive Data Set)

- p0186[D] (MDS number)
- p0187[D] (Enc 1 EDS number)
- p0188[D] (Enc 2 EDS number)

EDS-Geberdatensatz 0
p0141[0] = Komponentennummer des Sensor Modules
p0400[0] p0425[0]

No encoder configured 99

EDS for encoder 1
p0400[E]...
p0425[E]
(E = p0187)

EDS for encoder 2
p0400[E]...
p0425[E]
(E = p0188)

<1> Encoder errors always refer to the currently active Encoder Data Set.

- F07502 "Encoder Data Set EDS not configured"
- F07510 "Identical encoder in the drive data set"

Assigned parameters
- for position sensing for encoder n (4704)
- for speed actual value sensing for encoder n (4710)

Refer to [1020.7]
### Function diagrams

#### Data sets - Motor Data Sets (MDS)

**Fig. 2-181 8575 - Motor Data Sets (MDS)**

**DDS (Drive Data Set)**
- p0186[D] (MDS number)
- p0187[D] (enc 1 EDS number)
- p0188[D] (Enc 2 EDS number)

**Copy MDS, target**
- p0130(1)

**Copy MDS, start**
- p0130(0)

**Mot changeover**
- r0835.0
- r0835.1
- r0835.2
- r0835.3
- r0835.15

**Mot_changeover ZSW**
- r0835

**Mot_changeover sig**
- p0832[C]

**MDS selected**
- r0836[0]

**MDS effective**
- r0049[0]

**MDS_changeover ZSW**
- r0835

**Request pulse enable**
- p0832

**Feedback signal, contactor 0**
- p0831[0]

**Feedback signal, contactor 1**
- p0831[1]

**Feedback signal, contactor 2**
- p0831[2]

**Feedback signal, contactor 3**
- p0831[3]

**Feedback signal, contactor 15**
- p0831[15]

**Application**
- p0826[0]
- p0827[0]
- p0833.0

**DO: SERVO**
- p0139[0]
- p0139[1]
- p0139[2]

**Copy MDS, source**
- p0139(0)

**Motor changeover**
- r0832.0
- r0832.1
- r0832.2
- r0832.3

**Motor number**
- p0832.0

**Bit number**
- p0832.1

**p0832.2
- p0832.3

**Motor Module**
- M1
- M2

---

### Pulse cancellation

The following applies for the changeover of motor data sets:

- The thermal motor model of motors with the same motor number is identical. 
- An unequal bit number means that the motor must be changed over.

### Table

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DO: SERVO</strong></td>
<td><strong>fp_8575_98_eng.vsd</strong></td>
<td><strong>Function diagram</strong></td>
<td><strong>- 8575 -</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Data sets - Motor Data Sets (MDS)</strong></td>
<td>03.07.08 V04.04.00</td>
<td>SINAMICS S110</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## 2.22 CANopen interface

### Function diagrams

<table>
<thead>
<tr>
<th>Function Code</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>9204</td>
<td>Receive telegram, free PDO mapping (p8744 = 2)</td>
<td>2-956</td>
</tr>
<tr>
<td>9206</td>
<td>Receive telegram, Predefined Connection Set (p8744 = 1)</td>
<td>2-957</td>
</tr>
<tr>
<td>9208</td>
<td>Send telegram, free PDO mapping (p8744 = 2)</td>
<td>2-958</td>
</tr>
<tr>
<td>9210</td>
<td>Send telegram, Predefined Connection Set (p8744 = 1)</td>
<td>2-959</td>
</tr>
<tr>
<td>9220</td>
<td>Control word, CANopen</td>
<td>2-960</td>
</tr>
<tr>
<td>9226</td>
<td>Status word, CANopen</td>
<td>2-961</td>
</tr>
</tbody>
</table>
Fig. 2-182 9204 – Receive telegram, free PDO mapping (p8744 = 2)

<1> To use automatic BICO interconnection (p8790 = 1), one of the receive words 1-4 must be used as control word 1 (STW1).

<2> Telegram: up to 4 words or 64 bits. The sum of the various objects must not exceed 16 words.

CANopen interface - Receive telegram, free PDO mapping (p8744 = 2)

Refer to [1020.7]

Object 1
Object 2
Object 3
Object 4

Evaluation of the COB-ID

Object 1
Object 2
Object 3
Object 4

COB-ID for PDO 1
p870[0]

PDO mapping for PDO 1
p871[0...3]

Automatic assignment of the PDOs to the receive buffer

Objects available a multiple number of times are marshalled to the same position in the receive buffer.

PZD receive word 1
PZD receive word 2
PZD receive word 3
PZD receive word 4
PZD receive word 5
PZD receive word 6
PZD receive word 7
PZD receive word 8
PZD receive word 9
PZD receive word 10
PZD receive word 11
PZD receive word 12
PZD receive word 13
PZD receive word 14
PZD receive word 15
PZD receive word 16
PZD receive word 17
PZD receive word 18

RPDO 1
Object 1
Object 2
Object 3
Object 4

RPDO 2
Object 1
Object 2
Object 3
Object 4

RPDO 3
Object 1
Object 2
Object 3
Object 4

RPDO 4
Object 1
Object 2
Object 3
Object 4

RPDO 5
Object 1
Object 2
Object 3
Object 4

RPDO 6
Object 1
Object 2
Object 3
Object 4

RPDO 7
Object 1
Object 2
Object 3
Object 4

RPDO 8
Object 1
Object 2
Object 3
Object 4

COB-ID for PDO 1
p870[0]

PDO mapping for PDO 1
p871[0...3]

CAN bus sampling time

1  2  3  4  5  6  7  8
DO: SERVO
CANopen interface - Receive telegram, free PDO mapping (p8744 = 2)

fp_9204_98_eng.vsd

Function diagram

- 9204 -
Fig. 2-183  9206 – Receive telegram, Predefined Connection Set (p8744 = 1)

- 9206 -

Function diagram

Evaluate the COB-ID

COB-ID for RPDO 1 PDO mapping for RPDO 1

p8700[0]  p8710[0...3]

RPDO 1
60400010

Automatic assignment of the RPDOs to the receive buffer

<1>

Receive buffer

PZD receive word 1
-2060[0] DWORD

PZD receive word 2
-2060[1] DWORD

PZD receive word 3
-2060[2] DWORD

PZD receive word 4
-2060[3] DWORD

PZD receive word 5
-2060[4] DWORD

PZD receive word 6
-2060[5] DWORD

PZD receive word 7
-2060[6] DWORD

PZD receive word 8
-2060[7] DWORD

PZD receive word 9
-2060[8] DWORD

PZD receive word 10
-2060[9] DWORD

PZD receive word 11
-2060[10] DWORD

PZD receive word 12

PZD receive word 13
-2060[12] DWORD

PZD receive word 14
-2060[13] DWORD

PZD receive word 15
-2060[14] DWORD

PZD receive word 16
-2060[15] DWORD

PZD receive word 17
-2060[16] DWORD

PZD receive word 18
-2060[17] DWORD

<1> To use automatic BICO interconnection (p8780 = 1), one of the receive words 1-4 must be used as control word 1 (STW1).

<2> Telegram: up to 4 words or 64 bits. The sum of the various objects must not exceed 18 words.

DO: SERVO

CANopen interface - Receive telegram, Predefined Connection Set (p8744 = 1)

fp_9206_98_eng.vsd

Function diagram - 9206 -

SINAMICS S110
Fig. 2-184  9208 – Send telegram, free PDO mapping (p8744 = 2)

DO: SERVO

Function diagrams

CANopen interface

SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3

<1> Telegram: up to 4 words or 64 bits. The sum of the various objects must not exceed 28 words.
CANopen interface - Send telegram, Predefined Connection Set (p8744 = 1)

<1> Telegram: up to 4 words or 64 bits. The sum of the various objects must not exceed 28 words.

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>DO: SERVO</td>
<td>fp_9210_98_eng.vsd</td>
<td>Function diagram</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SINAMICS S110
## Signal targets for control word CANopen

<table>
<thead>
<tr>
<th>Signal</th>
<th>Meaning</th>
<th>Interconnection parameters</th>
<th>Function diagram Internal control word</th>
<th>Function diagram signal target</th>
<th>Inverted</th>
</tr>
</thead>
<tbody>
<tr>
<td>STW1.0</td>
<td>▲ = ON (pulses can be enabled)</td>
<td>p0840[0] = r2090.0</td>
<td>[2501.3]</td>
<td>[2610]</td>
<td>-</td>
</tr>
<tr>
<td>STW1.1</td>
<td>STW1.2</td>
<td>▲ = No coast-down activated (enable possible)</td>
<td>p0844[0] = r2090.1</td>
<td>[2501.3]</td>
<td>[2610]</td>
</tr>
<tr>
<td>STW1.2</td>
<td>▲ = No fast stop activated (enable possible)</td>
<td>p0848[0] = r2090.2</td>
<td>[2501.3]</td>
<td>[2610]</td>
<td>-</td>
</tr>
<tr>
<td>STW1.3</td>
<td>▲ = Enable operation (pulses can be enabled)</td>
<td>p0852[0] = r2090.3</td>
<td>[2501.3]</td>
<td>[2610]</td>
<td>-</td>
</tr>
<tr>
<td>STW1.4</td>
<td>▲ = Enable ramp-function generator</td>
<td>p1140[0] = r2090.4</td>
<td>[2501.3]</td>
<td>[3060]</td>
<td>-</td>
</tr>
<tr>
<td>STW1.5</td>
<td>▲ = Continue ramp-function generator</td>
<td>p1141[0] = r2090.5</td>
<td>[2501.3]</td>
<td>[3060]</td>
<td>-</td>
</tr>
<tr>
<td>STW1.6</td>
<td>▲ = Enable setpoint</td>
<td>p1142[0] = r2090.6</td>
<td>[2501.3]</td>
<td>[3060]</td>
<td>-</td>
</tr>
<tr>
<td>STW1.7</td>
<td>▲ = Acknowledge fault</td>
<td>p2103[0] = r2090.7</td>
<td>[2546.2]</td>
<td>[8060]</td>
<td>-</td>
</tr>
<tr>
<td>STW1.8</td>
<td>▲ = Stop</td>
<td></td>
<td></td>
<td>[3060]</td>
<td>-</td>
</tr>
<tr>
<td>STW1.9</td>
<td>Reserved</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>STW1.10</td>
<td>Reserved</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>STW1.11</td>
<td>Can be freely connected</td>
<td>pxxxx[y] = r2090.11</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>STW1.12</td>
<td>Can be freely connected</td>
<td>pxxxx[y] = r2090.12</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>STW1.13</td>
<td>Can be freely connected</td>
<td>pxxxx[y] = r2090.13</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>STW1.14</td>
<td>Can be freely connected</td>
<td>pxxxx[y] = r2090.14</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>STW1.15</td>
<td>Can be freely connected</td>
<td>pxxxx[y] = r2090.15</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

<1> Depending on the position of the CANopen control word in p8750, the number of the binector to be connected changes.

<2> Not valid for automatic BICO interconnection (p8780).
Fig. 2-187 9226 – Status word, CANopen

<table>
<thead>
<tr>
<th>Bit No.</th>
<th>Status word CANopen</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1 = Ready to power-up</td>
</tr>
<tr>
<td>1</td>
<td>1 = Ready to operate (DC link loaded, pulses blocked)</td>
</tr>
<tr>
<td>2</td>
<td>1 = Operation enabled (drive follows n_set)</td>
</tr>
<tr>
<td>3</td>
<td>1 = Fault present</td>
</tr>
<tr>
<td>4</td>
<td>1 = No coast down active</td>
</tr>
<tr>
<td>5</td>
<td>1 = No fast stop active</td>
</tr>
<tr>
<td>6</td>
<td>1 = Power-on inhibit active</td>
</tr>
<tr>
<td>7</td>
<td>1 = Alarm present</td>
</tr>
<tr>
<td>8</td>
<td>Freely interconnectable (BI: p8785)</td>
</tr>
<tr>
<td>9</td>
<td>1 = Control requested</td>
</tr>
<tr>
<td>10</td>
<td>1 = Target reached &lt;1&gt;</td>
</tr>
<tr>
<td>11</td>
<td>1 = Torque limit reached</td>
</tr>
<tr>
<td>12</td>
<td>1 = Velocity equal to zero</td>
</tr>
<tr>
<td>13</td>
<td>Reserved</td>
</tr>
<tr>
<td>14</td>
<td>Freely interconnectable (BI: p8786)</td>
</tr>
<tr>
<td>15</td>
<td>Freely interconnectable (BI: p8787)</td>
</tr>
</tbody>
</table>

<1> With setpoint channel: connect p2151 with r1119 [8011.2].

CANopen status word bit 8 = 0: from speed signals [8011.8] (r2197.7)
CANopen status word bit 8 = 1: from status word monitoring 3 [8010.8.8] (r2199.0)

From sequence control [2610]
From fault buffer [8060]
From alarm buffer [8065]
From status word monitoring 2 [8010.8] (r2199.0)
From status word speed controller [2522]

Bit 9 = 1 -> Ready to exchange process data

CAN bus sampling time
Refer to [1020.7] Status word CANopen
2.23 Basic Operator Panel 20 (BOP20)

Function diagrams

9912 – Control word interconnection 2-963
### Interconnection STW BOP (r0019)

<table>
<thead>
<tr>
<th>Signal</th>
<th>Meaning</th>
<th>Interconnection parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>STW BOP.0</td>
<td>1 = On</td>
<td>p0840[0] = r0019.0</td>
</tr>
<tr>
<td></td>
<td>0 = OFF (OFF1)</td>
<td></td>
</tr>
<tr>
<td>STW BOP.1</td>
<td>1 = No coast down</td>
<td>p0844[0] = r0019.1</td>
</tr>
<tr>
<td></td>
<td>0 = Coast down (OFF2)</td>
<td></td>
</tr>
<tr>
<td>STW BOP.2</td>
<td>1 = No fast stop</td>
<td>p0848[0] = r0019.2</td>
</tr>
<tr>
<td></td>
<td>0 = Fast stop (OFF3)</td>
<td></td>
</tr>
<tr>
<td>STW BOP.3</td>
<td>Reserved</td>
<td>-</td>
</tr>
<tr>
<td>STW BOP.4</td>
<td>Reserved</td>
<td>-</td>
</tr>
<tr>
<td>STW BOP.5</td>
<td>Reserved</td>
<td>-</td>
</tr>
<tr>
<td>STW BOP.6</td>
<td>Reserved</td>
<td>-</td>
</tr>
<tr>
<td>STW BOP.7</td>
<td>1 = Acknowledge fault</td>
<td>p2102[0] = r0019.7</td>
</tr>
<tr>
<td>STW BOP.8</td>
<td>Reserved</td>
<td>-</td>
</tr>
<tr>
<td>STW BOP.9</td>
<td>Reserved</td>
<td>-</td>
</tr>
<tr>
<td>STW BOP.10</td>
<td>Reserved</td>
<td>-</td>
</tr>
<tr>
<td>STW BOP.11</td>
<td>Reserved</td>
<td>-</td>
</tr>
<tr>
<td>STW BOP.12</td>
<td>Reserved</td>
<td>-</td>
</tr>
<tr>
<td>STW BOP.13</td>
<td>1 = Motorized potentiometer, raise</td>
<td>p1035[0] = r0019.13</td>
</tr>
<tr>
<td>STW BOP.14</td>
<td>1 = Motorized potentiometer, lower</td>
<td>p1036[0] = r0019.14</td>
</tr>
<tr>
<td>STW BOP.15</td>
<td>Reserved</td>
<td>-</td>
</tr>
</tbody>
</table>

**<1>** The BICO interconnection represents an example that can be be changed by the user.
Faults and alarms

Contents

3.1 Overview of faults and alarms 3-966
3.2 List of faults and alarms 3-975
3.1 Overview of faults and alarms

3.1.1 General information on faults and alarms

Faults and alarm displays

If a fault occurs, the drive indicates this by issuing corresponding fault(s) and/or alarm(s).

The following methods for displaying faults and alarms are available:

- Display via the fault and alarm buffer with PROFIBUS
- Display online via the commissioning software

Differences between faults and alarms

The differences between faults and alarms are as follows:

Table 3-1 Differences between faults and alarms

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faults</td>
<td>What happens when a fault occurs?</td>
</tr>
<tr>
<td></td>
<td>• The appropriate fault reaction is triggered.</td>
</tr>
<tr>
<td></td>
<td>• Status signal ZSW1.3 is set.</td>
</tr>
<tr>
<td></td>
<td>• The fault is entered in the fault buffer.</td>
</tr>
<tr>
<td></td>
<td>How are faults eliminated?</td>
</tr>
<tr>
<td></td>
<td>• Remove the original cause of the fault.</td>
</tr>
<tr>
<td></td>
<td>• Acknowledge the fault.</td>
</tr>
<tr>
<td>Alarms</td>
<td>What happens when an alarm occurs?</td>
</tr>
<tr>
<td></td>
<td>• Status signal ZSW1.7 is set.</td>
</tr>
<tr>
<td></td>
<td>• The alarm is entered in the alarm buffer.</td>
</tr>
<tr>
<td></td>
<td>How are alarms eliminated?</td>
</tr>
<tr>
<td></td>
<td>• Alarms acknowledge themselves. If the cause of</td>
</tr>
<tr>
<td></td>
<td>the alarm is no longer present, they automatically reset themselves.</td>
</tr>
</tbody>
</table>
Fault reactions

The following fault reactions are defined:

Table 3-2  Fault reactions

<table>
<thead>
<tr>
<th>List</th>
<th>PROFIdrive</th>
<th>Reaction</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NONE</td>
<td>-</td>
<td>None</td>
<td>No reaction when a fault occurs</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Note:</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>When the &quot;Basic positioner&quot; function module is activated (r0108.4 = 1), the following applies:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>When a fault occurs with fault reaction &quot;NONE&quot;, an active traversing task is interrupted and the system switches to the tracking mode until the fault has been rectified and acknowledged.</td>
</tr>
<tr>
<td>OFF1</td>
<td>ON/OFF</td>
<td>Brake along the ramp-function generator down ramp followed by pulse inhibit</td>
<td><strong>Closed-loop speed control (p1300 = 20, 21)</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• n_set = 0 is input immediately to brake the drive along the ramp-function generator down ramp (p1121).</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• When zero speed is detected, the motor holding brake (if parameters have been assigned for it) is closed (p1215). The pulses are suppressed when the brake closing time (p1217) expires.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Zero speed is detected if the actual speed drops below the threshold (p1226) or if the monitoring time (p1227) started when the speed setpoint &lt;= speed threshold (p1226) has expired.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Closed-loop torque control (p1300 = 23)</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• The following applies to closed-loop torque control mode:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Reaction as for OFF2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• When the system switches to closed-loop control with p1501, the following applies:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>No separate braking reaction.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>If the actual speed value drops below the speed threshold (p1226) or the timer stage (p1227) has expired, the motor holding brake (if one is being used) is closed. The pulses are suppressed when the brake closing time (p1217) expires.</td>
</tr>
<tr>
<td>OFF1_DELAYED</td>
<td>-</td>
<td>As for OFF1, but delayed</td>
<td>Faults with this fault reaction do not become effective until after the delay time set in p3136. The remaining time up to OFF1 is displayed in r3137.</td>
</tr>
<tr>
<td>OFF2</td>
<td>COAST STOP</td>
<td>Internal/external pulse inhibit</td>
<td><strong>Closed-loop speed and torque control</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Instantaneous pulse suppression, the drive &quot;coasts&quot; to a standstill.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• The motor holding brake (if one is being used) is closed immediately.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• &quot;Switching on inhibited&quot; is activated.</td>
</tr>
</tbody>
</table>
### Faults and alarms

#### Overview of faults and alarms

Table 3-2 Fault reactions, continued

<table>
<thead>
<tr>
<th>List</th>
<th>PROFIdrive</th>
<th>Reaction</th>
<th>Description</th>
</tr>
</thead>
</table>
| OFF3            | QUICK STOP | Brake along the OFF3 down ramp followed by pulse inhibit | Closed-loop speed control (p1300 = 20, 21)  
  - n_set = 0 is input immediately to brake the drive along the OFF3 down ramp (p1135).  
  - When zero speed is detected, the motor holding brake (if parameters have been assigned for it) is closed. The pulses are suppressed when the closing time of the holding brake (p1217) expires.  
  Zero speed is detected if the actual speed drops below the threshold (p1226) or if the monitoring time (p1227) started when the speed setpoint <= speed threshold (p1226) has expired.  
  - "Switching on inhibited" is activated.  

Closed-loop torque control (p1300 = 23)  
- Changeover to speed-controlled operation and other reactions as described for speed-controlled operation. |
| STOP1           | -          | -        | Under development |
| STOP2           | -          | n_set = 0 | n_set = 0 is input immediately to brake the drive along the OFF3 down ramp (p1135).  
  - The drive remains in closed-loop speed control mode. |
| IASC/DCBRAKE    | -          | -        | For synchronous motors, the following applies:  
  - If a fault occurs with this fault reaction, an internal armature short-circuit is triggered.  
    The conditions for p1231 = 4 must be observed.  
  - For induction motors, the following applies:  
    - If a fault occurs with this fault reaction, DC braking is triggered.  
    DC braking must have been commissioned (p1232, p1233, p1234). |
| ENCODER         | -          | Internal/external pulse inhibit (p0491) | The fault reaction ENCODER is applied as a function of the setting in p0491.  
  Factory setting:  
  p0491 = 0 --> Encoder fault causes OFF2  
  **Notice:**  
  When changing p0491, it is imperative that the information in the description of this parameter is carefully observed. |
Acknowledging faults

The list of faults and alarms specifies how to acknowledge each fault after the cause has been remedied.

<table>
<thead>
<tr>
<th>Acknowledgement</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>POWER ON</td>
<td>The fault is acknowledged by a POWER ON (switch drive unit off and on again).</td>
</tr>
<tr>
<td></td>
<td><strong>Note:</strong> If this action has not eliminated the fault cause, the fault is displayed again immediately after power up.</td>
</tr>
<tr>
<td>IMMEDIATELY</td>
<td>Faults can be acknowledged on one drive object (Points 1 to 3) or on all drive objects (Point 4) as follows:</td>
</tr>
<tr>
<td></td>
<td>1 Acknowledging by setting parameter:</td>
</tr>
<tr>
<td></td>
<td>p3981 = 0 --&gt; 1</td>
</tr>
<tr>
<td></td>
<td>2 Acknowledging via binector inputs:</td>
</tr>
<tr>
<td></td>
<td>p2103 BI: 1. Acknowledge faults</td>
</tr>
<tr>
<td></td>
<td>p2104 BI: 2. Acknowledge faults</td>
</tr>
<tr>
<td></td>
<td>p2105 BI: 3. Acknowledge faults</td>
</tr>
<tr>
<td></td>
<td>3 Acknowledging via a PROFIBUS control signal:</td>
</tr>
<tr>
<td></td>
<td>STW1.7 = 0 --&gt; 1 (edge)</td>
</tr>
<tr>
<td></td>
<td>4 Acknowledge all faults</td>
</tr>
<tr>
<td></td>
<td>p2102 BI: Acknowledge all faults</td>
</tr>
<tr>
<td></td>
<td>All of the faults on all of the drive objects of the drive system can be acknowledged using this binector input.</td>
</tr>
<tr>
<td></td>
<td><strong>Note:</strong></td>
</tr>
<tr>
<td></td>
<td>• These faults can also be acknowledged by a POWER ON operation.</td>
</tr>
<tr>
<td></td>
<td>• If this action has not eliminated the fault cause, the fault will continue to be displayed after acknowledgment.</td>
</tr>
<tr>
<td></td>
<td>• Safety Integrated faults</td>
</tr>
<tr>
<td></td>
<td>The &quot;Safe standstill&quot; (SH) function must be deselected before these faults are acknowledged.</td>
</tr>
<tr>
<td>PULSE INHIBIT</td>
<td>The fault can only be acknowledged with a pulse inhibit (r0899.11 = 0). The same options are available for acknowledging as described under acknowledgment with IMMEDIATELY.</td>
</tr>
</tbody>
</table>
3.1.2 Explanation of the list of faults and alarms

The data in the following example has been chosen at random. The information listed below is the maximum amount of information that a description can contain: Some of the information is optional.

The list of faults and alarms (See Chapter 3.2) is structured as follows:

- - - - - - - - - - - - - - - - - - - - - - - - - Start of example - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

<table>
<thead>
<tr>
<th>Axxxxx (F, N)</th>
<th>Fault location (optional): Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message value:</td>
<td>Component number: %1, cause of fault: %2</td>
</tr>
<tr>
<td>Drive object:</td>
<td>List of objects.</td>
</tr>
<tr>
<td>Reaction:</td>
<td>NONE</td>
</tr>
<tr>
<td>Acknowledge:</td>
<td>NONE</td>
</tr>
<tr>
<td>Cause:</td>
<td>Description of possible causes</td>
</tr>
<tr>
<td></td>
<td>Fault value (r0949, interpret format); or alarm value (r2124, interpret format); (optional)</td>
</tr>
<tr>
<td></td>
<td>Information about fault or alarm values (optional)</td>
</tr>
<tr>
<td>Remedy:</td>
<td>Description of possible remedies</td>
</tr>
<tr>
<td>Reaction upon F:</td>
<td>A_INFEED: OFF2 (OFF1, NONE)</td>
</tr>
<tr>
<td></td>
<td>SERVO: NONE (OFF1, OFF2, OFF3)</td>
</tr>
<tr>
<td></td>
<td>VECTOR: NONE (OFF1, OFF2, OFF3)</td>
</tr>
<tr>
<td>Acknowl. upon F:</td>
<td>IMMEDIATELY (POWER ON)</td>
</tr>
<tr>
<td>Reaction upon N:</td>
<td>NONE</td>
</tr>
<tr>
<td>Acknowl. upon N:</td>
<td>NONE</td>
</tr>
</tbody>
</table>

- - - - - - - - - - - - - - - - - - - - - - - - - End of example - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

Axxxxx Alarm xxxx
Axxxxx (F, N) Alarm xxxx (message type can be changed to F or N)
Fxxxxx Fault xxxx
Fxxxxx (A, N) Fault xxxx (report type can be changed to A or N)
Nxxxxx No message
Nxxxxx (A) No message (message type can be changed to A)
Cxxxxx Safety message (separate message buffer)

A message comprises a letter followed by the relevant number.

The meaning of the letters is as follows:

- A means "Alarm".
- F means "Fault".
- N means "No message" or "Internal message".
- C means "Safety message"

The optional parentheses indicate whether the type specified for this message can be changed and which message types can be adjusted via parameters (p2118, p2119).

Information on reaction and acknowledgment is specified independently for a message with an adjustable message type (e.g. reaction to F, acknowledgment for F).
Overview of faults and alarms

Fault location (optional): Name
The fault location (optional), the name of the fault or alarm, and the message number are all used to identify the message (e.g. with the commissioning software).

Message value:
The information provided under the message value tells you about the composition of the fault/alarm value.

Example:
Message value: Component number: %1, cause of fault: %2
This message value contains information about the component number and cause of the fault. The entries %1 and %2 are placeholders, which are filled appropriately in online operation (e.g. with the commissioning software).

Drive object:
Each message (fault/alarm) specifies the drive object in which it can be found.

A message can belong to either one, several, or all drive objects.

Reaction: Default fault reaction (adjustable fault reaction)
Specifies the default reaction in the event of a fault.
The optional parentheses indicate whether the default fault reactions can be changed and which fault reactions can be adjusted via parameters (p2100, p2101).

Note:
See Chapter 3.1.1
**Faults and alarms**

**Overview of faults and alarms**

**Acknowledge:** Default acknowledgment (adjustable acknowledgment)

Specifies the default method of acknowledging faults after the cause has been eliminated.

The optional parentheses indicate whether the default acknowledgment can be changed and which acknowledgment can be adjusted via parameters (p2126, p2127).

**Note:**

See Chapter 3.1.1

**Cause:**

Description of the possible causes of the fault/alarm. A fault or alarm value can also be specified (optional).

Fault value (r0949, format):

The fault value is entered in the fault buffer in r0949[0...63] and specifies additional, more precise information about a fault.

Alarm value (r2124, format):

The alarm value specifies additional, more precise information about an alarm.

The alarm value is entered in the alarm buffer in r2124[0...7] and specifies additional, more precise information about an alarm.

**Remedy:**

Description of the methods available for eliminating the cause of the active fault/alarm

---

**Alarm**

In certain cases, servicing and maintenance personnel are responsible for choosing a suitable method for eliminating the cause of faults.
3.1.3 Number ranges of faults and alarms

Note:
The following number ranges represent an overview of all faults and alarms used in the SINAMICS drive family.
The faults and alarms for the product described in this List Manual are described in detail in Chapter 3.2.

Faults and alarms are organized into the following number ranges:

Table 3-4 Number ranges of faults and alarms

<table>
<thead>
<tr>
<th>From</th>
<th>To</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>1000</td>
<td>3999</td>
<td>Control Unit</td>
</tr>
<tr>
<td>4000</td>
<td>4999</td>
<td>Reserved</td>
</tr>
<tr>
<td>5000</td>
<td>5999</td>
<td>Power unit</td>
</tr>
<tr>
<td>6000</td>
<td>6899</td>
<td>Infeed</td>
</tr>
<tr>
<td>6900</td>
<td>6999</td>
<td>Braking Module</td>
</tr>
<tr>
<td>7000</td>
<td>7999</td>
<td>Drive</td>
</tr>
<tr>
<td>8000</td>
<td>8999</td>
<td>Option Board</td>
</tr>
<tr>
<td>9000</td>
<td>12999</td>
<td>Reserved</td>
</tr>
<tr>
<td>13000</td>
<td>13010</td>
<td>Licensing</td>
</tr>
<tr>
<td>13002</td>
<td>19999</td>
<td>Reserved</td>
</tr>
<tr>
<td>20000</td>
<td>29999</td>
<td>OEM</td>
</tr>
<tr>
<td>30000</td>
<td>30999</td>
<td>DRIVE-CLiQ component power unit</td>
</tr>
<tr>
<td>31000</td>
<td>31999</td>
<td>DRIVE-CLiQ component encoder 1</td>
</tr>
<tr>
<td>32000</td>
<td>32999</td>
<td>DRIVE-CLiQ component encoder 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Note:</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Faults that occur are automatically output as an alarm if the encoder is parameterized as a direct measuring system and does not intervene in the motor control.</td>
</tr>
<tr>
<td>33000</td>
<td>33999</td>
<td>DRIVE-CLiQ component encoder 3</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Note:</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Faults that occur are automatically output as an alarm if the encoder is parameterized as a direct measuring system and does not intervene in the motor control.</td>
</tr>
<tr>
<td>34000</td>
<td>34999</td>
<td>Voltage Sensing Module (VSM)</td>
</tr>
<tr>
<td>35000</td>
<td>35199</td>
<td>Terminal Module 54F (TM54F)</td>
</tr>
<tr>
<td>35200</td>
<td>35999</td>
<td>Terminal Module 31 (TM31)</td>
</tr>
<tr>
<td>36000</td>
<td>36999</td>
<td>DRIVE-CLiQ Hub Module</td>
</tr>
</tbody>
</table>
### Faults and alarms

#### Overview of faults and alarms

Table 3-4  Number ranges of faults and alarms, continued

<table>
<thead>
<tr>
<th>From</th>
<th>To</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>40000</td>
<td>40999</td>
<td>Controller Extension 32 (CX32)</td>
</tr>
<tr>
<td>41000</td>
<td>48999</td>
<td>Reserved</td>
</tr>
<tr>
<td>49000</td>
<td>49999</td>
<td>SINAMICS GM/SM/GL</td>
</tr>
<tr>
<td>50000</td>
<td>50499</td>
<td>Communication Board (COMM BOARD)</td>
</tr>
<tr>
<td>50500</td>
<td>59999</td>
<td>OEM Siemens</td>
</tr>
<tr>
<td>60000</td>
<td>65535</td>
<td>SINAMICS DC MASTER (closed-loop DC current control)</td>
</tr>
</tbody>
</table>
# 3.2 List of faults and alarms


## F01000 Internal software error

<table>
<thead>
<tr>
<th>Message value:</th>
<th>%1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive object:</td>
<td>All objects</td>
</tr>
<tr>
<td>Reaction:</td>
<td>OFF2</td>
</tr>
<tr>
<td>Acknowledge:</td>
<td>POWER ON</td>
</tr>
<tr>
<td>Cause:</td>
<td>An internal software error has occurred. Fault value (r0949, interpret hexadecimal): Only for internal Siemens troubleshooting.</td>
</tr>
<tr>
<td>Remedy:</td>
<td>- evaluate fault buffer (r0945). - carry out a POWER ON (power off/on) for all components. - upgrade firmware to later version. - contact the Hotline. - replace the Control Unit.</td>
</tr>
</tbody>
</table>

## F01001 FloatingPoint exception

<table>
<thead>
<tr>
<th>Message value:</th>
<th>%1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive object:</td>
<td>All objects</td>
</tr>
<tr>
<td>Reaction:</td>
<td>OFF2</td>
</tr>
<tr>
<td>Acknowledge:</td>
<td>POWER ON</td>
</tr>
<tr>
<td>Cause:</td>
<td>An exception occurred during an operation with the FloatingPoint data type. The error may be caused by the base system or an OA application (e.g., FBLOCKS, DCC). Fault value (r0949, interpret hexadecimal): Only for internal Siemens troubleshooting. Note: Refer to r9999 for further information about this fault. r9999[0]: Fault number. r9999[1]: Program counter at the time when the exception occurred. r9999[2]: Cause of the FloatingPoint exception. Bit 0 = 1: Operation invalid Bit 1 = 1: Division by zero Bit 2 = 1: Overflow Bit 3 = 1: Underflow Bit 4 = 1: Imprecise result</td>
</tr>
<tr>
<td>Remedy:</td>
<td>- carry out a POWER ON (power off/on) for all components. - check configuration and signals of the blocks in FBLOCKS. - check configuration and signals of DCC charts. - upgrade firmware to later version. - contact the Hotline.</td>
</tr>
</tbody>
</table>

## F01002 Internal software error

<table>
<thead>
<tr>
<th>Message value:</th>
<th>%1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive object:</td>
<td>All objects</td>
</tr>
<tr>
<td>Reaction:</td>
<td>OFF2</td>
</tr>
<tr>
<td>Acknowledge:</td>
<td>IMMEDIATELY</td>
</tr>
<tr>
<td>Cause:</td>
<td>An internal software error has occurred. Fault value (r0949, interpret hexadecimal): Only for internal Siemens troubleshooting.</td>
</tr>
<tr>
<td>Remedy:</td>
<td>- carry out a POWER ON (power off/on) for all components. - upgrade firmware to later version. - contact the Hotline.</td>
</tr>
</tbody>
</table>
**Faults and alarms**

**List of faults and alarms**

---

**F01003**  
**Acknowledgement delay when accessing the memory**

- **Message value:** %1
- **Drive object:** All objects
- **Reaction:** OFF2
- **Acknowledge:** IMMEDIATELY
- **Cause:** A memory area was accessed that does not return a "READY".
  - Fault value (r0949, interpret hexadecimal):
  - Only for internal Siemens troubleshooting.
- **Remedy:**
  - carry out a POWER ON (power off/on) for all components.
  - contact the Hotline.

---

**N01004 (F, A)**  
**Internal software error**

- **Message value:** %1
- **Drive object:** All objects
- **Reaction:** NONE
- **Acknowledge:** NONE
- **Cause:** An internal software error has occurred.
  - Fault value (r0949, hexadecimal):
  - Only for internal Siemens troubleshooting.
- **Remedy:**
  - read out diagnostics parameter (r9999).
  - contact the Hotline.

---

**F01005**  
**Firmware download for DRIVE-CLiQ component unsuccessful**

- **Message value:** Component number: %1, fault cause: %2
- **Drive object:** All objects
- **Reaction:** NONE
- **Acknowledge:** IMMEDIATELY
- **Cause:** It was not possible to download the firmware to a DRIVE-CLiQ component.
  - Fault value (r0949, interpret hexadecimal):
  - yyyy = component number, xxxx = fault cause
  - yyyy = 000B hex = 11 dec:
    - DRIVE-CLiQ component has detected a checksum error.
  - yyyy = 000F hex = 15 dec:
    - The selected DRIVE-CLiQ component did not accept the contents of the firmware file.
  - yyyy = 0012 hex = 18 dec:
    - Firmware version is too old and is not accepted by the component.
  - yyyy = 0013 hex = 19 dec:
    - Firmware version is not suitable for the hardware release of the component.
  - yyyy = 0065 hex = 101 dec:
    - After several communication attempts, no response from the DRIVE-CLiQ component.
  - yyyy = 008B hex = 139 dec:
    - Initially, a new boot loader is loaded (must be repeated after POWER ON).
  - yyyy = 008C hex = 140 dec:
    - Firmware file for the DRIVE-CLiQ component not available on the memory card.
  - yyyy = 008D hex = 141 dec:
    - An inconsistent length of the firmware file was signaled. The firmware download may have been caused by a loss of connection to the firmware file. This can occur during a project download/reset in the case of a SINAMICS Integrated Control Unit, for example.
  - yyyy = 008F hex = 143 dec:
    - Component has not changed to the mode for firmware download. It was not possible to delete the existing firmware.
  - yyyy = 0090 hex = 144 dec:
    - When checking the firmware that was downloaded (checksum), the component detected a fault. It is possible that the file on the memory card is defective.
List of faults and alarms

A01006  Firmware update for DRIVE-CLiQ component required
Message value: Component number: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The firmware of a DRIVE-CLiQ component must be updated as there is no suitable firmware or firmware version in the component for operation with the Control Unit. Alarm value (r2124, interpret decimal):
Component number of the DRIVE-CLiQ component.
Remedy: Firmware update using the commissioning software:
The firmware version of all of the components on the "Version overview" page can be read in the Project Navigator under "Configuration" of the associated drive unit and an appropriate firmware update can be carried out. Firmware update via parameter:
- take the component number from the alarm value and enter into p7828.
- start the firmware download with p7829 = 1.

A01007  POWER ON for DRIVE-CLiQ component required
Message value: Component number: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: A DRIVE-CLiQ component must be powered up again (POWER ON) (e.g. due to a firmware update). Alarm value (r2124, interpret decimal):
Component number of the DRIVE-CLiQ component.
Note: For a component number = 1, a POWER ON of the Control Unit is required.
Remedy: Switch off the power supply of the specified DRIVE-CLiQ component and switch it on again.

A01009 (N)  CU: Control module overtemperature
Message value:  
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The temperature (r0037[0]) of the control module (Control Unit) has exceeded the specified limit value.
Remedy: - check the air intake for the Control Unit.
- check the Control Unit fan.
Note: The alarm automatically disappears after the limit value has been undershot.
Reaction upon N: NONE
Acknowl. upon N: NONE

Checking the loaded firmware (checksum) was not completed by the component in the appropriate time.
Component with the specified component number is not available (p7828).

Remedy:
- check the selected component number (p7828).
- check the DRIVE-CLiQ connection.
- save suitable firmware file for download in the directory */siemens/sinamics/code/sac/.
- use a component with a suitable hardware version
- after POWER ON has been carried out again for the DRIVE-CLiQ component, download the firmware again.

Depending on p7826, the firmware will be automatically downloaded.

xxxx = 0091 hex = 145 dec:
Checking the loaded firmware (checksum) was not completed by the component in the appropriate time.
xxxx = 009C hex = 156 dec:
Component with the specified component number is not available (p7828).
xxxx = Additional values:
Only for internal Siemens troubleshooting.

- check the selected component number (p7828).
- check the DRIVE-CLiQ connection.
- save suitable firmware file for download in the directory */siemens/sinamics/code/sac/.
- use a component with a suitable hardware version
- after POWER ON has been carried out again for the DRIVE-CLiQ component, download the firmware again.

Depending on p7826, the firmware will be automatically downloaded.
Faults and alarms

List of faults and alarms

F01010  Drive type unknown
Message value:  %1
Drive object:  All objects
Reaction:  NONE
Acknowledge:  IMMEDIATELY
Cause:  An unknown drive type was found.
Fault value (r0949, decimal interpretation):
Drive object number (refer to p0101, p0107).
Remedy:  
- replace Power Module.
- carry out a POWER ON (power off/on) for all components.
- upgrade firmware to later version.
- contact the Hotline.

F01011 (N)  Download interrupted
Message value:  %1
Drive object:  All objects
Reaction:  NONE
Acknowledge:  IMMEDIATELY
Cause:  The project download was interrupted.
Fault value (r0949, decimal interpretation):
1: The user prematurely interrupted the project download.
2: The communication cable was interrupted (e.g. cable breakage, cable withdrawn).
3: The project download was prematurely ended by the commissioning software (e.g. STARTER, SCOUT).
100: Different versions between the firmware version and project files "Download from card".
Note:  The response to an interrupted download is the state "first commissioning".
Remedy:  
- check the communication cable.
- download the project again.
- boot from previously saved files (power-down/power-up or p0976).
- when downloading from the card, use the matching version.

F01012 (N)  Project conversion error
Message value:  %1
Drive object:  SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction:  OFF2 (NONE)
Acknowledge:  IMMEDIATELY
Cause:  When converting the project of an older firmware version, an error occurred.
Fault value (r0949, decimal interpretation):
Parameter number of the parameter causing the error.
For fault value = 600, the following applies:
The temperature evaluation is no longer assigned to the power unit but to the encoder evaluation.
Notice:  Monitoring of the motor temperature is no longer ensured.
Remedy:  
Check the parameter indicated in the fault value and correctly adjust it accordingly.
For fault value = 600:
Parameter p0600 must be set to the values 1, 2 or 3 in accordance with the assignment of the internal encoder evaluation to the encoder interface.
Value 1 means: The internal encoder evaluation is assigned to the encoder interface 1 via p0187.
Value 2 means: The internal encoder evaluation is assigned to the encoder interface 2 via p0188.
Value 3 means: The internal encoder evaluation is assigned to the encoder interface 3 via p0189.
- If necessary, the internal encoder evaluation must be assigned to an encoder interface via parameters p0187, p0188 or p0189 accordingly.
- If necessary, upgrade the firmware to a later version.

Reaction upon N:  NONE
Acknowl. upon N:  NONE
<table>
<thead>
<tr>
<th>Fault code</th>
<th>Description</th>
<th>Message value</th>
<th>Drive object</th>
<th>Reaction</th>
<th>Acknowledge</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
</table>
| F01015    | Internal software error            | %1            | All objects    | OFF2      | POWER ON    | An internal software error has occurred. Fault value (r0949, decimal interpretation): Only for internal Siemens troubleshooting. | - carry out a POWER ON (power off/on) for all components.  
- upgrade firmware to later version.  
- contact the Hotline. |
| A01016 (F)| Firmware changed                   | %1            | All objects    | NONE      | NONE        | At least one firmware file in the directory /SIEMENS/SINAMICS/ has been changed without authorization with respect to the version shipped from the factory. No changes are permitted in this directory. Alarm value (r2124, interpret decimal):  
0: Checksum of one file is incorrect.  
1: File missing.  
2: Too many files.  
3: Incorrect firmware version.  
4: Incorrect checksum of the back-up file. See also: r9925 (Firmware file incorrect) | For the non-volatile memory for the firmware (memory card/device memory), restore the delivery condition. Note: The file involved can be read out using parameter r9925. See also: r9926 (Firmware check status) |
| A01017    | Component lists changed            | %1            | All objects    | NONE      | NONE        | On the memory card, one file in the directory /SIEMENS/SINAMICS/DATA or /ADDON/SINAMICS/DATA has been illegally changed with respect to that supplied from the factory. No changes are permitted in this directory. Alarm value (r2124, interpret decimal):  
zyx dec: x = Problem, y = Directory, z = File name  
x = 1: File does not exist.  
x = 2: Firmware version of the file does not match the software version.  
x = 3: File checksum is incorrect.  
y = 0: Directory /SIEMENS/SINAMICS/DATA/  
y = 1: Directory /ADDON/SINAMICS/DATA/  
z = 0: File MOTARM.ACX  
z = 1: File MOTSRM.ACX  
z = 2: File MOTSLM.ACX  
z = 3: File ENCDATA.ACX  
z = 4: File FILTDATA.ACX  
z = 5: File BRKDATA.ACX  
z = 6: File DAT_BEAR.ACX  
z = 7: File CFG_BEAR.ACX  
z = 8: File ENC_GEAR.ACX | For the file on the memory card involved, restore the status originally supplied from the factory. |
**F01018 Booting has been interrupted several times**

Message value:  -  
Drive object:  All objects  
Reaction:  NONE  
Acknowledge:  POWER ON  
Cause:  Module booting was interrupted several times.  
Possible reasons for booting being interrupted:  
- POWER OFF of the module.  
- CPU crash.  
- USER data invalid.  
After this fault is output, then the module is booted with the factory settings.  
Remedy:  Power down the module and power it up again.  
Note:  After switching on, the module reboots from the USER data (if available).  
If the fault situation is repeated, then this fault is again output after several interrupted boots.

**A01019 Writing to the removable data medium unsuccessful**

Message value:  -  
Drive object:  All objects  
Reaction:  NONE  
Acknowledge:  NONE  
Cause:  The write access to the removable data medium was unsuccessful.  
Remedy:  Remove and check the removable data medium. Then run the data backup again.

**A01020 Write to RAM disk unsuccessful**

Message value:  -  
Drive object:  All objects  
Reaction:  NONE  
Acknowledge:  NONE  
Cause:  The write access to the internal RAM disk was unsuccessful.  
Remedy:  Adapt the size of the system logbook (p9930) to the internal RAM disk.

**F01023 Software timeout (internal)**

Message value:  %1  
Drive object:  All objects  
Reaction:  NONE  
Acknowledge:  IMMEDIATELY  
Cause:  An internal software timeout has occurred.  
Fault value (r0949, decimal interpretation):  
Only for internal Siemens troubleshooting.  
Remedy:  - carry out a POWER ON (power off/on) for all components.  
- upgrade firmware to later version.  
- contact the Hotline.

**F01030 Sign-of-life failure for master control**

Message value:  -  
Drive object:  SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
Reaction:  OFF3 (ENCODER, IASC/DCBRAKE, NONE, OFF1, OFF2, STOP1, STOP2)  
Acknowledge:  IMMEDIATELY  
Cause:  For active PC master control, no sign-of-life was received within the monitoring time.  
The master control was returned to the active BICO interconnection.  
Remedy:  Set the monitoring time higher at the PC or, if required, completely disable the monitoring function.  
For the commissioning software, the monitoring time is set as follows:  
<Drive> -> Commissioning -> Control panel -> Button "Fetch master control" -> A window is displayed to set the monitoring time in milliseconds.
Notice:
The monitoring time should be set as short as possible. A long monitoring time means a late response when the communication fails!

---

**F01031**  
**Message value:**  
**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
**Reaction:** OFF3 (ENCODER, IASC/DCBRAKE, NONE, OFF1, OFF2, STOP1, STOP2)  
**Acknowledge:** IMMEDIATELY  
**Cause:** With the “OFF in REMOTE” mode active, no sign-of-life was received within 3 seconds.  
**Remedy:** - Check the data cable connection at the serial interface for the Control Unit (CU) and operator panel.  
- Check the data cable between the Control Unit and operator panel.

---

**F01033**  
**Message value:** Parameter: %1  
**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
**Reaction:** NONE  
**Acknowledge:** IMMEDIATELY  
**Cause:** When changing over the units to the referred representation type, it is not permissible for any of the required reference parameters to be equal to 0.0  
Fault value (r0949, parameter): Reference parameter whose value is 0.0.  
See also: p0349 (System of units, motor equivalent circuit diagram data), p0505 (Selecting the system of units), p0595 (Selecting technological units)  
**Remedy:** Set the value of the reference parameter to a number different than 0.0.  

---

**F01034**  
**Message value:** Parameter: %1  
**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
**Reaction:** NONE  
**Acknowledge:** IMMEDIATELY  
**Cause:** The change of a reference parameter meant that for an involved parameter the selected value was not able to be re-calculated in the per unit representation. The change was rejected and the original parameter value restored.  
Fault value (r0949, parameter): Parameter whose value was not able to be re-calculated.  
**Remedy:** Select the value of the reference parameter such that the parameter involved can be calculated in the per unit representation.  

---

**A01035 (F)**  
**Message value:** %1  
**Drive object:** All objects  
**Reaction:** NONE  
**Acknowledge:** NONE  
**Cause:** When the Control Unit is booted, no complete data set was found from the parameter back-up files. The last time that the parameterization was saved, it was not completely carried out. Instead, a back-up data set or a back-up parameter back-up file is downloaded.  
Alarm value (r2124, interpret hexadecimal): Only for internal Siemens troubleshooting.  
**Remedy:** If you have saved the project using the commissioning software, carry out a new download for your project. Save using the function “Copy RAM to ROM” or with p0977 = 1 so that all of the parameter files are again completely written to the non-volatile memory.  
**Reaction upon F:** NONE (OFF1, OFF2, OFF3)  
**Acknowl. upon F:** IMMEDIATELY
### Fault and Alarm List

**F01036 (A)** **ACX:** Parameter back-up file missing

- **Message value:** %1
- **Drive object:** All objects
- **Reaction:** NONE (OFF1, OFF2, OFF3)
- **Acknowledge:** IMMEDIATELY
- **Cause:**
  When downloading the device parameterization, a parameter back-up file associated with a drive object cannot be found. Neither a PSxxxyyy.ACX, a PSxxxyyy.NEW nor a PSxxxyyy.BAK parameter back-up file exists in the non-volatile memory for this drive object.
  
  Fault value (r0949, interpret hexadecimal):
  - Byte 1: yyy in the file name PSxxxyyy.ACX
  - yyy = 000 --> consistency back-up file
  - yyy = 001 ... 062 --> drive object number
  - yyy = 099 --> PROFIBUS parameter back-up file
  - Byte 2, 3, 4:
    - Only for internal Siemens troubleshooting.

- **Remedy:**
  - If you have saved the project data using the commissioning software, carry out a new download for your project.
  - Save using the function "Copy RAM to ROM" or with p0977 = 1 so that all of the parameter files are again completely written to the non-volatile memory.
  - If you have not saved the project data, then first commissioning of the system has to be carried out again.

**F01037 (A)** **ACX:** Re-naming the parameter back-up file unsuccessful

- **Message value:** %1
- **Drive object:** All objects
- **Reaction:** NONE (OFF1, OFF2, OFF3)
- **Acknowledge:** IMMEDIATELY
- **Cause:**
  Re-naming after saving a parameter back-up file in the non-volatile memory was unsuccessful.
  
  One of the parameter back-up files to be re-named had the "read only" attribute. The parameter back-up files are saved in the directory \USER\SINAMICS\DATA.
  
  It is possible that the non-volatile memory is defective.
  
  Fault value (r0949, interpret hexadecimal):
  - Byte 1: yyy in the file names PSxxxyyy.*, CAxxxyyy.*, or CCxxxyyy.*
  - yyy = 000 --> consistency back-up file
  - yyy = 099 --> PROFIBUS parameter back-up file PSxxx099.*
  - Byte 2:
    - xxx in the file name PSxxxyyy.*
    - xxx = 000 --> data save started with p0977 = 1
    - xxx = 010 --> data save started with p0977 = 10
    - xxx = 011 --> data save started with p0977 = 11
    - xxx = 012 --> data save started with p0977 = 12
  - Byte 4, 3:
    - Only for internal Siemens troubleshooting.

- **Remedy:**
  - check whether one of the files to be overwritten has the attribute "read only" and change this file attribute to "writable". Check all of the files (PSxxxyyy.*, CAxxxyyy.*, CCxxxyyy.* that belong to drive yyy designated in the fault value.
  - replace the memory card or Control Unit.

**F01038 (A)** **ACX:** Loading the parameter back-up file unsuccessful

- **Message value:** %1
- **Drive object:** All objects
- **Reaction:** NONE (OFF1, OFF2, OFF3)
- **Acknowledge:** IMMEDIATELY
- **Cause:**
  An error has occurred when downloading PSxxxyyy.ACX or PTxxxyyy.ACX files from the non-volatile memory.
  
  Fault value (r0949, interpret hexadecimal):
  - Byte 1: yyy in the file name PSxxxyyy.ACX
  - yyy = 000 --> consistency back-up file
Faults and alarms

List of faults and alarms

- Faults and alarms
- 3-983© Siemens AG 2012 All Rights Reserved
- SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3

YYY = 001 ... 062 --> drive object number
YYY = 099 --> PROFIBUS parameter back-up file
Byte 2:
255 = incorrect drive object type
254 = topology comparison unsuccessful --> drive object type was not able to be identified
Reasons could be:
- incorrect component type in the actual topology
- component does not exist in the actual topology
- component not active
Otherwise for internal Siemens troubleshooting.
Byte 4, 3:
Only for internal Siemens troubleshooting.

Remedy:
- If you have saved the project data using the commissioning software, carry out a new download for your project.
  Save using the function "Copy RAM to ROM" or with p0977 = 1 so that all of the parameter files are again completely written to the non-volatile memory.
- replace the memory card or Control Unit.
- for byte 1 = 255:
  Correct the drive object type (see p0107).

Reaction upon A: NONE
Acknowl. upon A: NONE

F01039 (A) ACX: Writing to the parameter back-up file was unsuccessful
Message value: %1
Drive object: All objects
Reaction: NONE (OFF1, OFF2, OFF3)
Acknowledge: IMMEDIATELY
Cause:
Writing to at least one parameter back-up file PSxxxyyy.*** in the non-volatile memory was unsuccessful.
- In the directory /USER/SINAMICS/DATA/ at least one parameter back-up file PSxxxyyy.*** has the "read only" file attribute and cannot be overwritten.
- There is not sufficient free memory space available.
- The non-volatile memory is defective and cannot be written to.
Fault value (r0949, interpret hexadecimal):
dcba hex
a = yyy in the file names PSxxxyyy.***
a = 000 --> consistency back-up file
a = 001 ... 062 --> drive object number
a = 070 --> FEPROM.BIN
a = 080 --> DEL4BOOT.TXT
a = 099 --> PROFIBUS parameter back-up file
b = xxx in the file names PSxxxyyy.***
b = 000 --> data save started with p0977 = 1
b = 010 --> data save started with p0977 = 10
b = 011 --> data save started with p0977 = 11
b = 012 --> data save started with p0977 = 12
d, c:
Only for internal Siemens troubleshooting.

Remedy:
- check the file attribute of the files (PSxxxyyy.***, CAxxxyyy.***, CCxxxyyy.***)) and, if required, change from "read only" to "writeable".
- check the free memory space in the non-volatile memory. Approx. 80 kbyte of free memory space is required for every drive object in the system.
- replace the memory card or Control Unit.

Reaction upon A: NONE
Acknowl. upon A: NONE
### F01040  Save parameter settings and carry out a POWER ON

**Message value:**  
-  
**Drive object:**  All objects  
**Reaction:**  OFF2  
**Acknowledge:**  POWER ON  
**Cause:**  A parameter was changed in the drive system which means that it is necessary to save the parameters and re-boot (e.g. p0110).  
**Remedy:**  
- save the parameters (p0971/p0977).  
- carry out a POWER ON (power off/on) for all components.

### F01041  Parameter save necessary

**Message value:**  %1  
**Drive object:**  All objects  
**Reaction:**  NONE  
**Acknowledge:**  IMMEDIATELY  
**Cause:**  Defective or missing files were detected on the memory card when booting. Fault value (r0949, decimal interpretation):  
1: Source file cannot be opened.  
2: Source file cannot be read.  
3: Target directory cannot be set up.  
4: Target file cannot be set up/opened.  
5: Target file cannot be written to.  
Additional values: Only for internal Siemens troubleshooting.  
**Remedy:**  
- save the parameters.  
- download the project again to the drive unit.  
- update the firmware  
- if required, replace the Control Unit and/or memory card card.

### F01042  Parameter error during project download

**Message value:**  Parameter: %1, Index: %2, fault cause: %3  
**Drive object:**  All objects  
**Reaction:**  OFF2 (NONE, OFF1, OFF3)  
**Acknowledge:**  IMMEDIATELY  
**Cause:**  An error was detected when downloading a project using the commissioning software (e.g. incorrect parameter value). For the specified parameter, it was detected that dynamic limits were exceeded that may possibly depend on other parameters. Fault value (r0949, interpret hexadecimal):  
ccbbaaaa hex  
aaaa = Parameter  
bb = Index  
cc = fault cause  
0: Parameter number illegal.  
1: Parameter value cannot be changed.  
2: Lower or upper value limit exceeded.  
3: Sub-index incorrect.  
4: No array, no sub-index.  
5: Data type incorrect.  
6: Setting not permitted (only resetting).  
7: Descriptive element cannot be changed.  
9: Descriptive data not available.  
11: No master control.  
15: No text array available.  
17: Task cannot be executed due to operating state.  
20: Illegal value.  
21: Response too long.  
22: Parameter address illegal.  
23: Format illegal.
24: Number of values not consistent.
25: Drive object does not exist.
101: Presently de-activated.
104: Illegal value.
107: Write access not permitted when controller enabled.
108: Unit unknown.
109: Write access only in the commissioning state, encoder (p0010 = 4).
110: Write access only in the commissioning state, motor (p0010 = 3).
111: Write access only in the commissioning state, power unit (p0010 = 2).
112: Write access only in the quick commissioning mode (p0010 = 1).
113: Write access only in the ready mode (p0010 = 0).
114: Write access only in the commissioning state, parameter reset (p0010 = 30).
115: Write access only in the Safety Integrated commissioning state (p0010 = 95).
116: Write access only in the commissioning state, technological application/units (p0010 = 5).
117: Write access only in the commissioning state (p0010 not equal to 0).
118: Write access only in the commissioning state, download (p0010 = 29).
119: Parameter may not be written in download.
120: Write access only in the commissioning state, drive basis configuration (device: p0009 = 3).
121: Write access only in the commissioning state, define drive type (device: p0009 = 2).
122: Write access only in the commissioning state, data set basis configuration (device: p0009 = 4).
123: Write access only in the commissioning state, device configuration (device: p0009 = 1).
124: Write access only in the commissioning state, device download (device: p0009 = 29).
125: Write access only in the commissioning state, device parameter reset (device: p0009 = 30).
126: Write access only in the commissioning state, device ready (device: p0009 = 0).
127: Write access only in the commissioning state, device (device: p0009 not equal to 0).
128: Write access only in the commissioning state, technological application/units (device: p0009 = 4).
129: Write access only in the commissioning state, parameter reset (device: p0009 = 30).
130: Parameter may not be written in download.
131: Transfer of the master control is inhibited via binector input p0806.
132: Free BICO interconnection inhibited via p0922.
133: Access method not defined.
200: Below the valid values.
201: Above the valid values.
202: Cannot be accessed from the Basic Operator Panel (BOP).
203: Cannot be read from the Basic Operator Panel (BOP).
204: Write access not permitted.

Remedy:
- enter the correct value in the specified parameter.
- identify the parameter that restricts the limits of the specified parameter.

F01043 Fatal error at project download
Message value: Fault cause: %1
Drive object: All objects
Reaction: OFF2 (OFF1, OFF3)
Acknowledge: IMMEDIATELY
Cause: A fatal error was detected when downloading a project using the commissioning software.
Fault value (r0949, decimal interpretation):
1: Device status cannot be changed to Device Download (drive object ON?).
2: Incorrect drive object number.
3: A drive object that has already been deleted is deleted again.
4: Deleting a drive object that has already been registered for generation.
5: Deleting a drive object that does not exist.
6: Generating an undeleted drive object that already existed.
7: Regenerating a drive object already registered for generation.
8: Maximum number of drive objects that can be generated exceeded.
9: Error while generating a device drive object.
10: Error while generating target topology parameters (p9902 and p9903).
11: Error while generating a drive object (global component).
12: Error while generating a drive object (drive component).
13: Unknown drive object type.
14: Drive status cannot be changed to "ready for operation" (p0947 and p0949).
15: Drive status cannot be changed to drive download.
16: Device status cannot be changed to "ready for operation".
17: It is not possible to download the topology. The component wiring should be checked, taking into account the various messages/signals.
19: The slot for the option module has been configured several times (e.g. CAN and COMM BOARD)
20: The configuration is inconsistent (e.g. CAN for Control Unit, however no CAN configured for drive objects A_INF, SERVO or VECTOR).

Remedy:
- use the current version of the commissioning software.
- modify the offline project and carry out a new download (e.g. compare the number of drive objects, motor, encoder, power unit in the offline project and at the drive).
- change the drive state (is a drive rotating or is there a message/signal?).
- carefully note any other messages/signals and remove their cause.

### Faults and alarms

<table>
<thead>
<tr>
<th>Fault Code</th>
<th>Description</th>
<th>Message Value</th>
<th>Drive Object</th>
<th>Reaction</th>
<th>Acknowledge</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>F01044</td>
<td>CU: Descriptive data error</td>
<td>%1</td>
<td>All objects</td>
<td>OFF2</td>
<td>POWER ON</td>
<td>An error was detected when loading the descriptive data saved in the non-volatile memory.</td>
<td>Replace the memory card or Control Unit.</td>
</tr>
<tr>
<td>A01045</td>
<td>CU: Configuring data invalid</td>
<td>%1</td>
<td>All objects</td>
<td>NONE</td>
<td>NONE</td>
<td>An error was detected when evaluating the parameter files PSxxxxxx.ACX, PTxxxxxx.ACX, CAxxxxxx.ACX, or CCxxxxxx.ACX saved in the non-volatile memory.</td>
<td>Restore the factory setting using (p0976 = 1) and re-load the project to the drive unit. Operation without any restrictions is then possible. After downloading the project, save the parameters in STARTER using &quot;Copy RAM to ROM&quot; or with p0977 = 1. This overwrites the incorrect parameter files in the non-volatile memory.</td>
</tr>
<tr>
<td>A01049</td>
<td>CU: It is not possible to write to file</td>
<td>%1</td>
<td>All objects</td>
<td>NONE</td>
<td>NONE</td>
<td>It is not possible to write into a write-protected file (PSxxxxxx.acx). The write request was interrupted.</td>
<td>Check whether the &quot;write protected&quot; attribute has been set for the files in the non-volatile memory under .../USER/SINAMICS/DATA/... When required, remove write protection and save again (e.g. set p0977 to 1).</td>
</tr>
<tr>
<td>F01050</td>
<td>Memory card and device incompatible</td>
<td></td>
<td>All objects</td>
<td>OFF2 (NONE, OFF1, OFF3)</td>
<td>IMMEDIATELY</td>
<td>The memory card and the device type do not match (e.g. a memory card for SINAMICS S is inserted in SINAMICS G).</td>
<td>- insert the matching memory card. - use the matching Control Unit or power unit.</td>
</tr>
</tbody>
</table>
F01054 **CU: System limit exceeded**

**Message value:** %1  
**Drive object:** All objects  
**Reaction:** OFF2  
**Acknowledge:** IMMEDIATELY  
**Cause:** At least one system overload has been identified.  
Fault value (r0949, decimal interpretation):  
1: Computing time load too high (r9976[1]).  
5: Peak load too high (r9976[5]).  
See also: r9976 (System utilization)  
**Remedy:**  
- reduce the computing time load of the drive unit (r9976[1] and r9976[5]) to under 100 %.  
- check the sampling times and adjust if necessary (p0115, p0799, p4099).  
- de-activate function modules.  
- de-activate drive objects.  
- remove drive objects from the target topology.  
- note the DRIVE-CLiQ topology rules and if required, change the DRIVE-CLiQ topology.  
When using the Drive Control Chart (DCC) or free function blocks (FBLOCKS), the following applies  
- the computing time load of the individual run-time groups on a drive object can be read out in r21005 (DCC) or r20005 (FBLOCKS).  
- if necessary, the assignment of the run-time group (p21000, p20000) can be changed in order to increase the sampling time (r21001, r20001).  
- if necessary, reduce the number of cyclically calculated blocks (DCC) and/or function blocks (FBLOCKS).

A01064 (F) **CU: Internal error (CRC)**

**Message value:** -  
**Drive object:** All objects  
**Reaction:** NONE  
**Acknowledge:** NONE  
**Cause:** CRC error in the Control Unit program memory  
**Remedy:**  
- carry out a POWER ON (power off/on) for all components.  
- upgrade firmware to later version.  
- contact the Hotline.  
**Reaction upon F:** NONE (OFF1, OFF2, OFF3, STOP2)  
**Acknowl. upon F:** IMMEDIATELY (POWER ON)

F01068 **CU: Data memory, memory overflow**

**Message value:** %1  
**Drive object:** All objects  
**Reaction:** OFF2  
**Acknowledge:** IMMEDIATELY  
**Cause:** A data memory area has been overloaded.  
Fault value (r0949, interpret binary):  
Bit 0 = 1: High-speed data memory 1 overloaded  
Bit 1 = 1: High-speed data memory 2 overloaded  
Bit 2 = 1: High-speed data memory 3 overloaded  
Bit 3 = 1: High-speed data memory 4 overloaded  
**Remedy:**  
- de-activate the function module.  
- de-activate the drive object.  
- remove the drive object from the target topology.
### A01069 Parameter backup and device incompatible

**Message value:** -

**Drive object:** CU_S110-CAN, CU_S110-DP, CU_S110-PN

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:** The parameter backup on the memory card and the device type do not match (e.g. a memory card with the parameter backup of a SINAMICS DCM is inserted in SINAMICS G110). The module boots with the factory settings.

**Remedy:**
- insert a memory card with compatible parameter backup and carry out a POWER ON.
- insert a memory card without parameter backup and carry out a POWER ON.
- remove the memory card and carry out POWER ON.
- save the parameters (p0977 = 1).

---

### A01069 Parameter backup and device incompatible

**Message value:** -

**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:** The parameter backup on the memory card and the device type do not match (e.g. a memory card with the parameter backup of a SINAMICS S120 is inserted in SINAMICS G150). The module boots with the factory settings.

**Remedy:**
- insert a memory card with compatible parameter backup and carry out a POWER ON.
- insert a memory card without parameter backup and carry out a POWER ON.
- save the parameters (p0977 = 1).

---

### A01099 Tolerance window of time synchronization exited

**Message value:** -

**Drive object:** All objects

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:** The time master exited the selected tolerance window for time synchronization. See also: p3109 (RTC real time synchronization, tolerance window)

**Remedy:** Select the re-synchronization interval so that the synchronization deviation between the time master and drive system lies within the tolerance window. See also: r3108 (RTC last synchronization deviation)

---

### F01105 (A) CU: Insufficient memory

**Message value:** %1

**Drive object:** All objects

**Reaction:** OFF1

**Acknowledge:** POWER ON

**Cause:** Too many functions have been configured on this Control Unit (e.g. too many drives, function modules, data sets, OA applications, blocks, etc.). Fault value (r0949, decimal interpretation):
- Only for internal Siemens troubleshooting.

**Remedy:**
- change the configuration on this Control Unit (e.g. fewer drives, function modules, data sets, OA applications, blocks, etc).
- use an additional Control Unit.

**Reaction upon A:** NONE

**Acknowledge upon A:** NONE
### F01107 CU: Data save in the non-volatile memory unsuccessful

| Message value: | %1 |
| Drive object: | All objects |
| Reaction: | NONE |
| Acknowledge: | IMMEDIATELY |
| Cause: | A data save in the non-volatile memory was not able to be successfully carried out. |
| Remedy: | - try to save again. |

#### Cause:
- non-volatile memory is defective.
- insufficient space in the non-volatile memory.

- Fault value (r0949, decimal interpretation):
  - Only for internal Siemens troubleshooting.

- Remedy:
  - replace the memory card or Control Unit.

### F01112 CU: Power unit not permissible

| Message value: | %1 |
| Drive object: | All objects |
| Reaction: | NONE |
| Acknowledge: | IMMEDIATELY |
| Cause: | The connected power unit cannot be used together with this Control Unit. |
| Remedy: | Replace the power unit that is not permissible by a component that is permissible. |

- Fault value (r0949, decimal interpretation):
  - 1: Power unit is not supported (e.g. PM240).
  - 2: DC/AC power unit connected to CU310 not permissible.

### F01120 (A) Terminal initialization has failed

| Message value: | %1 |
| Drive object: | All objects |
| Reaction: | OFF1 (OFF2) |
| Acknowledge: | IMMEDIATELY (POWER ON) |
| Cause: | An internal software error occurred while the terminal functions were being initialized. |
| Remedy: | - carry out a POWER ON (power off/on) for all components. |
| Reaction upon A: | NONE |
| Acknowl. upon A: | NONE |

### F01122 (A) Frequency at the measuring probe input too high

| Message value: | %1 |
| Drive object: | All objects |
| Reaction: | OFF1 (OFF2) |
| Acknowledge: | IMMEDIATELY |
| Cause: | The frequency of the pulses at the measuring probe input is too high. |
| Remedy: | Reduce the frequency of the pulses at the measuring probe input. |
| Reaction upon A: | NONE |
| Acknowl. upon A: | NONE |
### F01150  
**CU: Number of instances of a drive object type exceeded**

**Message value:** Drive object type: %1, number permitted: %2, actual number: %3  
**Drive object:** All objects  
**Reaction:** NONE  
**Acknowledge:** IMMEDIATELY  
**Cause:** The maximum permissible number of instances of a drive object type was exceeded.  
Fault value (r0949, interpret hexadecimal):  
ddccbbaa hex:  
aa: Drive object type (p0107), for which the maximum permissible number of instances was exceeded.  
bb: Max. permissible number of instances for this drive object type.  
cc: Actual number of instances for this drive object type.  
dd: No significance.  
**Remedy:**  
- power down the unit.  
- suitably restrict the number of instances of a drive object type by reducing the number of inserted components.  
- re-commission the unit.

### F01200  
**CU: Time slice management internal software error**

**Message value:** %1  
**Drive object:** All objects  
**Reaction:** OFF2  
**Acknowledge:** IMMEDIATELY (POWER ON)  
**Cause:** A time slice management error has occurred.  
It is possible that the sampling times have been inadmissibly set.  
Fault value (r0949, interpret hexadecimal):  
998: Too many time slices occupied by OA (e.g. DCC).  
999: Too many time slices occupied by the basic system. Too many different sampling times may have been set.  
Additional values:  
Only for internal Siemens troubleshooting.  
**Remedy:**  
- check the sampling time setting (p0112, p0115, p4099).  
- contact the Hotline.

### F01205  
**CU: Time slice overflow**

**Message value:** %1  
**Drive object:** All objects  
**Reaction:** OFF2  
**Acknowledge:** IMMEDIATELY (POWER ON)  
**Cause:** Insufficient processing time is available for the existing topology.  
Fault value (r0949, interpret hexadecimal):  
Only for internal Siemens troubleshooting.  
**Remedy:**  
- reduce the number of drives.  
- increase the sampling times.

### A01224  
**CU: Pulse frequency inconsistent**

**Message value:** %1  
**Drive object:** All objects  
**Reaction:** NONE  
**Acknowledge:** NONE  
**Cause:** When changing the minimum pulse frequency (p0113) inconsistency between the pulse frequencies was identified.  
Alarm value (r2124, interpret decimal):  
1: Value, low minimum value.  
2: Value, high maximum value.  
3: Resulting sampling time is not a multiple of 1.25 µs.  
4: Value does not match clock-cycle synchronous PROFIBUS operation.  
10: Special restriction of the drive object violated.  
99: Inconsistency of cross drive objects detected.  
116: Recommended clock cycle in r0116[0...1].
Remedy: Set a valid pulse frequency.

**F01250** CU: CU-EEPROM incorrect read-only data

**Message value:** %1  
**Drive object:** All objects  
**Reaction:** NONE (OFF2)  
**Acknowledge:** POWER ON  
**Cause:** Error when reading the read-only data of the EEPROM in the Control Unit. Fault value (r0949, decimal interpretation): Only for internal Siemens troubleshooting.

**Remedy:**  
- carry out a POWER ON.  
- replace the Control Unit.

**A01251** CU: CU-EEPROM incorrect read-write data

**Message value:** %1  
**Drive object:** All objects  
**Reaction:** NONE  
**Acknowledge:** NONE  
**Cause:** Error when reading the read-write data of the EEPROM in the Control Unit. Alarm value (r2124, interpret decimal): Only for internal Siemens troubleshooting.

**Remedy:** For alarm value r2124 < 256, the following applies:  
- carry out a POWER ON.  
- replace the Control Unit.  
For alarm value r2124 >= 256, the following applies:  
- for the drive object with this alarm, clear the fault memory (p0952 = 0).  
- as an alternative, clear the fault memory of all drive objects (p2147 = 1).  
- replace the Control Unit.

**F01303** DRIVE-CLiQ component does not support the required function

**Message value:** %1  
**Drive object:** All objects  
**Reaction:** OFF2  
**Acknowledge:** IMMEDIATELY  
**Cause:** A function requested by the Control Unit is not supported by a DRIVE-CLiQ component. Fault value (r0949, decimal interpretation):  
1: The component does not support the de-activation.  
101: The Motor Module does not support an internal armature short-circuit.  
102: The Motor Module does not support the de-activation.  
201: The Sensor Module does not support actual value inversion (p0410.0 = 1) when using a Hall sensor (p0404.6 = 1) for the commutation.  
202: The Sensor Module does not support parking/unparking.  
203: The Sensor Module does not support the de-activation.  
204: The firmware of this Terminal Module 15 (TM15) does not support the application TM15DI/DO.  
205: The Sensor Module does not support the selected temperature evaluation (r0458).  
206: The firmware of this Terminal Modules TM41/TM31/TM15 refers to an old firmware version. It is urgently necessary to upgrade the firmware to ensure disturbance-free operation.  
207: The power unit with this hardware version does not support operation with device supply voltages of less than 380 V.  
208: The Sensor Module does not support de-selection of commutation with zero mark (via p0430.23).  
211: The Sensor Module does not support single-track encoders (r0459.10).  
212: The Sensor Module does not support LVDT sensors (p4677.0).  
213: The Sensor Module does not support the characteristic type (p4662).

**Remedy:** Upgrade the firmware of the DRIVE-CLiQ component involved. For fault value = 205:  
Check parameter p0600 and p0601 and if required, adapt interpretation.  
For fault value = 207:  
Replace the power unit or if required set the device supply voltage higher (p0210).
List of faults and alarms

For fault value = 208:
Check parameter p0430.23 and reset if necessary.

A01304 (F)  Firmware version of DRIVE-CLiQ component is not up-to-date
Message value:  %1
Drive object:  All objects
Reaction:  NONE
Acknowledge:  NONE
Cause:  The non-volatile memory has a more recent firmware version than the one in the connected DRIVE-CLiQ component.
Alarm value (r2124, interpret decimal):
Component number of the DRIVE-CLiQ component involved.
Remedy:  Update the firmware (p7828, p7829 and commissioning software).
Reaction upon F:  NONE
Acknowl. upon F:  IMMEDIATELY

F01305  Topology: Component number missing
Message value:  %1
Drive object:  All objects
Reaction:  NONE
Acknowledge:  IMMEDIATELY
Cause:  The component number from the topology was not parameterized (p0121 (for power unit, refer to p0107), p0131 (for servo/vector drives, refer to p0107), p0141, p0151, p0161).
Fault value (r0949, decimal interpretation):
Data set number.
Note:
The fault also occurs if speed encoders have been configured (p0187 to p0189) but no component numbers exist for them.
In this case, the fault value includes the drive data set number plus 100 * encoder number (e.g. 3xx, if a component number was not entered in p0141 for the third encoder (p0189)).
See also:  p0121, p0131, p0141, p0142, p0186, p0187, p0188
Remedy:  Enter the missing component number or remove the component and restart commissioning.
See also:  p0121, p0131, p0141, p0142, p0186, p0187, p0188

A01306  Firmware of the DRIVE-CLiQ component being updated
Message value:  %1
Drive object:  All objects
Reaction:  NONE
Acknowledge:  NONE
Cause:  Firmware update is active for at least one DRIVE-CLiQ component.
Alarm value (r2124, interpret decimal):
Component number of the DRIVE-CLiQ component.
Remedy:  Not necessary.
This alarm automatically disappears after the firmware has been updated.

A01314  Topology: Component must not be present
Message value:  Component number: %1, Component class: %2, Connection number: %3
Drive object:  All objects
Reaction:  NONE
Acknowledge:  NONE
Cause:  For a component, "de-activate and not present" is set but this component is still in the topology.
Alarm value (r2124, interpret hexadecimal):
ddcbbaba hex:
aa = component number
bb = component class of the component
cc = connection number
Note:
Component class and connection number are described in F01375.
List of faults and alarms

A01315  Drive object not ready for operation
Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: For the active drive object involved, at least one activated component is missing.
Remedy: The alarm automatically disappears again with the following actions:
- de-activate the drive object involved (p0105 = 0).
- de-activate the components involved (p0125 = 0, p0145 = 0, p0155 = 0, p0165 = 0).
- re-insert the components involved.
See also: p0145 (Activate/de-activate encoder interface)

A01316  Drive object inactive and again ready for operation
Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: If, when inserting a component of the target topology, an inactive, non-operational drive object becomes operational again. The associated parameter of the component is, in this case, set to "activate" (p0125, p0145, p0155, p0165).
Remedy: The alarm automatically disappears again with the following actions:
- activate the drive object involved (p0105 = 1).
- again withdraw the components involved.

A01317 (N)  De-activated component again present
Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: If a component of the target topology for an active drive object is inserted and the associated parameter of the component is set to "de-activate" (p0125, p0145, p0155, p0165).
Remedy: The alarm automatically disappears again with the following actions:
- activate the components involved (p0125 = 1, p0145 = 1, p0155 = 1, p0165 = 1).
- again withdraw the components involved.
See also: p0145 (Activate/de-activate encoder interface)

A01318  BICO: De-activated interconnections present
Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: This alarm is used in the following cases:
- If an inactive/non-operational drive object is active again/ready for operation
Faults and alarms

List of faults and alarms

- If there are items in the list of BI/CI parameters (r9498[0...29], r9499[0...29])
- If the BICO interconnections saved in the list of BI/CI parameters (r9498[0...29], r9499[0...29]) have actually been changed

Remedy:
- Reset alarm:
  - Set p9496 to 1 or 2
  - De-activate the drive object again.

A01319  Inserted component not initialized
Message value:  
Drive object:  SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction:  NONE
Acknowledge:  NONE
Cause:  Initialization is required for at least one inserted component. This is only possible if the pulses are inhibited for all the drive objects.
Remedy:  Activate pulse inhibit for all drive objects.

A01320  Topology: Drive object number does not exist in configuration
Message value:  %1
Drive object:  All objects
Reaction:  NONE
Acknowledge:  NONE
Cause:  A drive object number is missing in p0978
Alarm value (r2124, interpret decimal):
Index of p0101 under which the missing drive object number can be determined.
Remedy:  Set p0009 to 1 and change p0978:
Rules:
- p0978 must include all of the drive object numbers (p0101).
- It is not permissible for a drive object number to be repeated.
- By entering a 0, the drive objects with PZD are separated from those without PZD.
- Only 2 partial lists are permitted. After the second 0, all values must be 0.
- Dummy drive object numbers (255) are only permitted in the first partial list.

A01321  Topology: Drive object number does not exist in configuration
Message value:  %1
Drive object:  All objects
Reaction:  NONE
Acknowledge:  NONE
Cause:  P0978 contains a drive object number that does not exist.
Alarm value (r2124, interpret decimal):
Index of p0978 under which the drive object number can be determined.
Remedy:  Set p0009 to 1 and change p0978:
Rules:
- p0978 must include all of the drive object numbers (p0101).
- It is not permissible for a drive object number to be repeated.
- By entering a 0, the drive objects with PZD are separated from those without PZD.
- Only 2 partial lists are permitted. After the second 0, all values must be 0.
- Dummy drive object numbers (255) are only permitted in the first partial list.

A01322  Topology: Drive object number present twice in configuration
Message value:  %1
Drive object:  All objects
Reaction:  NONE
Acknowledge:  NONE
Cause:  A drive object number is present more than once in p0978.
Alarm value (r2124, interpret decimal):
Index of p0978 under which the involved drive object number is located.
<table>
<thead>
<tr>
<th>Fault Code</th>
<th>Description</th>
<th>Message Value</th>
<th>Drive Object</th>
<th>Reaction</th>
<th>Acknowledge</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>A01323</td>
<td>Topology: More than two partial lists created</td>
<td>%1</td>
<td>All objects</td>
<td>NONE</td>
<td>NONE</td>
<td>Partial lists are available more than twice in p0978. After the second 0, all must be 0.</td>
<td>Set p0009 to 1 and change p0978: Rules: - p0978 must include all of the drive object numbers (p0101). - it is not permissible for a drive object number to be repeated. - by entering a 0, the drive objects with PZD are separated from those without PZD. - only 2 partial lists are permitted. After the second 0, all values must be 0. - dummy drive object numbers (255) are only permitted in the first partial list.</td>
</tr>
<tr>
<td>A01324</td>
<td>Topology: Dummy drive object number incorrectly created</td>
<td>%1</td>
<td>All objects</td>
<td>NONE</td>
<td>NONE</td>
<td>In p0978, dummy drive object numbers (255) are only permitted in the first partial list.</td>
<td>Set p0009 to 1 and change p0978: Rules: - p0978 must include all of the drive object numbers (p0101). - it is not permissible for a drive object number to be repeated. - by entering a 0, the drive objects with PZD are separated from those without PZD. - only 2 partial lists are permitted. After the second 0, all values must be 0. - dummy drive object numbers (255) are only permitted in the first partial list.</td>
</tr>
<tr>
<td>F01325</td>
<td>Topology: Component Number not present in target topology</td>
<td>Component number: %1</td>
<td>All objects</td>
<td>NONE</td>
<td>IMMEDIATELY</td>
<td>The component configured in a parameter (e.g. p0121, p0131, etc.) is not present in the target topology.</td>
<td>Establish topology and DO configuration consistency.</td>
</tr>
<tr>
<td>A01330</td>
<td>Topology: Quick commissioning not possible</td>
<td>Fault cause: %1, supplementary information: %2, preliminary component number: %3</td>
<td>All objects</td>
<td>NONE</td>
<td>NONE</td>
<td>Unable to carry out a quick commissioning. The existing actual topology does not fulfill the requirements.</td>
<td></td>
</tr>
</tbody>
</table>
Faults and alarms

List of faults and alarms

Alarm value (r2124, interpret hexadecimal):
ccccbbaa hex: cccc = preliminary component number, bb = supplementary information, aa = fault cause
aa = 01 hex = 1 dec:
On one component illegal connections were detected.
- bb = 01 hex = 1 dec: For a Motor Module, more than one motor with DRIVE-CLiQ was detected.
- bb = 02 hex = 2 dec: For a motor with DRIVE-CLiQ, the DRIVE-CLiQ cable is not connected to a Motor Module.
aa = 02 hex = 2 dec:
The topology contains too many components of a particular type.
- bb = 01 hex = 1 dec: There is more than one master Control Unit.
- bb = 02 hex = 2 dec: There is more than 1 infeed (8 for a parallel circuit configuration).
- bb = 03 hex = 3 dec: There are more than 10 Motor Modules (8 for a parallel circuit configuration).
- bb = 04 hex = 4 dec: There are more than 9 encoders.
- bb = 05 hex = 5 dec: There are more than 8 Terminal Modules.
- bb = 07 hex = 7 dec: Unknown component type
- bb = 08 hex = 8 dec: There are more than 6 drive slaves.
- bb = 09 hex = 9 dec: Connection of a drive slave not permitted.
- bb = 0a hex = 10 dec: There is no drive master.
- bb = 0b hex = 11 dec: There is more than one motor with DRIVE-CLiQ for a parallel circuit.
- bb = 0c hex = 12 dec: Different power units are being used in a parallel connection.
- cccc: Not used.
aa = 03 hex = 3 dec:
More than 16 components are connected at a DRIVE-CLiQ socket of the Control Unit.
- bb = 0, 1, 2, 3 means e.g. detected at the DRIVE-CLiQ socket X100, X101, X102, X103.
- cccc: Not used.
aa = 04 hex = 4 dec:
The number of components connected one after the other is greater than 125.
- bb: Not used.
- cccc = preliminary component number of the first component and component that resulted in the fault.
aa = 05 hex = 5 dec:
The component is not permissible for SERVO.
- bb = 01 hex = 1 dec: SINAMICS G available.
- bb = 02 hex = 2 dec: Chassis available.
- cccc = preliminary component number of the first component and component that resulted in the fault.
aa = 06 hex = 6 dec:
On one component illegal EEPROM data was detected. These must be corrected before the system continues to boot.
- bb = 01 hex = 1 dec: The Order No. [MLFB] of the power unit that was replaced includes a space retainer. The space retainer (*) must be replaced by a correct character.
- cccc = preliminary component number of the component with illegal EEPROM data.
aa = 07 hex = 7 dec:
The actual topology contains an illegal combination of components.
- bb = 01 hex = 1 dec: Active Line Module (ALM) and Basic Line Module (BLM).
- bb = 02 hex = 2 dec: Active Line Module (ALM) and Smart Line Module (SLM).
- bb = 03 hex = 3 dec: SIMOTION control (e.g. SIMOTION D445) and SINUMERIK component (e.g. NX15).
- bb = 04 hex = 4 dec: SINUMERIK control (e.g. SINUMERIK 730.net) and SIMOTION component (e.g. CX32).
- cccc: Not used.
Note:
Connection type and connection number are described in F01375.
See also: p0097 (Select drive object type)

Remedy:
- adapt the output topology to the permissible requirements.
- carry out commissioning using the commissioning software.
- for motors with DRIVE-CLiQ, connect the power and DRIVE-CLiQ cable to the same Motor Module (Single Motor Module: DRIVE-CLiQ at X202, Double Motor Module: DRIVE-CLiQ from motor 1 (X1) to X202, from motor 2 (X2) to X203).
Re aa = 06 hex = 6 dec and bb = 01 hex = 1 dec:
Correct the order number when commissioning using the commissioning software.
See also: p0097 (Select drive object type)
A01331 Topology: At least one component not assigned to a drive object
Message value: Component number: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: At least one component is not assigned to a drive object.
- when commissioning, a component was not able to be automatically assigned to a drive object.
- the parameters for the data sets are not correctly set.
Alarm value (r2124, interpret decimal):
Component number of the unassigned component.
Remedy: This component is assigned to a drive object.
Check the parameters for the data sets.
Examples:
- power unit (p0121).
- motor (p0131, p0186).
- encoder interface (p0140, p0141, p0187 ... p0189).
- encoder (p0140, p0142, p0187 ... p0189).
- Terminal Module (p0151).
- option board (p0161).

F01354 Topology: Actual topology indicates an illegal component
Message value: Fault cause: %1, component number: %2
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY
Cause: The actual topology indicates at least one illegal component.
Fault value (r0949, interpret hexadecimal):
yyxx hex: yy = component number, xx = cause.
xx = 1: Component at this Control Unit not permissible.
xx = 2: Component in combination with another component not permissible.
Note:
Pulse enable is prevented.
Remedy: Remove the illegal components and restart the system.

F01355 Topology: Actual topology changed
Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY
Cause: The device target topology (p0099) does not correspond to the device actual topology (r0098).
The fault only occurs if the topology was commissioned using the automatic internal device mechanism and not using
the commissioning software.
Fault value (r0949, decimal interpretation):
Only for internal Siemens troubleshooting.
Remedy: One of the following counter-measures can be selected if no faults have occurred in the topology detection itself:
If commissioning is still not completed:
- carry out a self-commissioning routine (starting from p0009 = 1).
In general:
Set p0099 = r0098, set p0009 = 0; for existing Motor Modules, this results in servo drives being automatically gener-
erated (p0107).
Generating servo drives: Set p0097 to 1, set p0009 to 0.
Generating vector drives: Set p0097 to 2, set p0009 to 0.
Generating vector drives with parallel circuit: Set p0097 to 12, set p0009 to 0.
In order to set configurations in p0108, before setting p0009 to 0, it is possible to first set p0009 to 2 and modify
p0108. The index corresponds to the drive object (p0107).
If commissioning has already been completed:
- re-establish the original connections and re-connect power to the Control Unit.
- restore the factory setting for the complete equipment (all of the drives) and allow automatic self-commissioning again.
- change the device parameterization to match the connections (this is only possible using the commissioning software).

Notice:
Topology changes that result in this fault being generated cannot be accepted by the automatic function in the device, but must be transferred using the commissioning software and parameter download. The automatic function in the device only allows constant topology to be used. Otherwise, when the topology is changed, all of the previous parameter settings are lost and replaced by the factory setting.

---

**F01356**  
**Topology: Defective components in actual topology**

**Message value:** Fault cause: %1, Component number: %2, Connection number: %3  
**Drive object:** All objects  
**Reaction:** OFF2  
**Acknowledge:** IMMEDIATELY  
**Cause:** The actual topology indicates at least one defective DRIVE-CLiQ component. Fault value (r0949, interpret hexadecimal):
zzyyxx hex:
z = connection number of component before the defective component
y = component number of component before the defective component
x = fault cause
x = 1: Component at this Control Unit not permissible.

**Remedy:** Remove the defective components and restart the system.

---

**F01360**  
**Topology: Actual topology not permissible**

**Message value:** Fault cause: %1, preliminary component number: %2  
**Drive object:** All objects  
**Reaction:** NONE  
**Acknowledge:** IMMEDIATELY  
**Cause:** The detected actual topology is not permissible. Fault value (r0949, interpret hexadecimal):
ccccbaa hex: cccc = preliminary component number, aa = fault cause
aa = 01 hex = 1 dec:
Too many components were detected at the Control Unit. A maximum of 199 components is permissible.

aa = 02 hex = 2 dec:
The component type of a component is not known.

aa = 03 hex = 3 dec:
It is illegal to combine ALM and BLM.

aa = 04 hex = 4 dec:
It is illegal to combine ALM and SLM.

aa = 05 hex = 5 dec:
It is illegal to combine BLM and SLM.

aa = 06 hex = 6 dec:
A CX32 was not directly connected to a permitted Control Unit.

aa = 07 hex = 7 dec:
An NX10 or NX15 was not directly connected to a permitted Control Unit.

aa = 08 hex = 8 dec:
A component was connected to a Control Unit that is not permitted for this purpose.

aa = 09 hex = 9 dec:
A component was connected to a Control Unit with out-of-date firmware.

aa = 0A hex = 10 dec:
Too many components of a particular type detected.

aa = 0B hex = 11 dec:
Too many components of a particular type detected on a single line.

Note:
The drive system is no longer booted. In this state, the drive control (closed-loop) cannot be enabled.
Remedy:

Re fault cause = 1:
Change the configuration. Connect less than 199 components to the Control Unit.
Re fault cause = 2:
Remove the component with unknown component type.
Re fault cause = 3, 4, 5:
Establish a valid combination.
Re fault cause = 6, 7:
Connect the expansion module directly to a permitted Control Unit.
Re fault cause = 8:
Remove component or use a permissible component.
Re fault cause = 9:
Upgrade the firmware of the Control Unit to a later version.
Re fault cause = 10, 11:
Reduce the number of components.

A01361  Topology: Actual topology contains SINUMERIK and SIMOTION components
Message value:
%1
Drive object:
All objects
Reaction:
NONE
Acknowledge:
NONE
Cause:
The detected actual topology contains SINUMERIK and SIMOTION components.
The drive system is no longer booted. In this state, the drive control (closed-loop) cannot be enabled.
Alarm value (r2124, interpret hexadecimal):
ddccbbaa hex: cc = fault cause, bb = component class of the actual topology, aa = component number of the component
cc = 01 hex = 1 dec:
An NX10 or NX15 was connected to a SIMOTION control.
cc = 02 hex = 2 dec:
A CX32 was connected to a SINUMERIK control.
Remedy:
Re alarm value = 1:
Replace all NX10 or NX15 by a CX32.
Re alarm value = 2:
Replace all CX32 by an NX10 or NX15.

F01380  Topology: Actual topology, defective EEPROM
Message value:
Preliminary component number: %1
Drive object:
All objects
Reaction:
NONE
Acknowledge:
POWER ON
Cause:
When detecting the actual topology, a component with a defective EEPROM was detected.
Fault value (r0949, interpret hexadecimal):
bbbbaaaaa hex:
aaaa = preliminary component number of the defective components
Remedy:
Output the fault value and remove the defected component.

A01416  Topology: Comparison additional component in actual topology
Message value:
Component number: %1, Component class: %2, Connection number: %3
Drive object:
All objects
Reaction:
NONE
Acknowledge:
NONE
Cause:
The topology comparison has found a component in the actual topology which is not specified in the target topology.
The alarm value includes the component number and connection number of the component with which the additional component is connected.
Alarm value (r2124, interpret hexadecimal):
ddccbbaa hex:
cc = connection number
bb = component class of the additional component
aa = component number
Note:
- components that are connected to this additional component are not operational.
## Faults and alarms

### List of faults and alarms

#### Remedy:
Adapting the topologies:
- remove the additional component in the actual topology.
- download the target topology that matches the actual topology (commissioning software).

<table>
<thead>
<tr>
<th>Fault Code</th>
<th>Description</th>
<th>Message value</th>
<th>Drive object</th>
<th>Reaction</th>
<th>Acknowledge</th>
<th>Cause</th>
<th>Alarm value (r2124, interpret hexadecimal):</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>A01420</td>
<td>Topology: Comparison a component is different</td>
<td>Component number: %1, component class target: %2, component class actual: %3, fault cause: %4</td>
<td>All objects</td>
<td>NONE</td>
<td>NONE</td>
<td>The topology comparison has detected differences in the actual and target topologies in relation to one component. There are differences in the electronic rating plate. Alarm value (r2124, interpret hexadecimal): ddccbbbaa hex: aa = component number of the component, bb = component class of the target topology, cc = component class of the actual topology, dd = fault cause dd = 01 hex = 1 dec: Different component type. dd = 02 hex = 2 dec: Different Order No. dd = 03 hex = 3 dec: Different manufacturer. Note: Component class and component type are described in F01375.</td>
<td>Adapting the topologies: - check the component soft-wired connections against the hardware configuration of the drive unit in the commissioning software and correct differences.</td>
<td></td>
</tr>
<tr>
<td>A01425</td>
<td>Topology: Comparison serial number of a component is different</td>
<td>Component number: %1, Component class: %2, Differences: %3</td>
<td>All objects</td>
<td>NONE</td>
<td>NONE</td>
<td>The topology comparison has detected differences in the actual and target topologies in relation to one component. The serial number is different. Alarm value (r2124, interpret hexadecimal): ddccbbbaa hex: cc = number of differences bb = component class aa = component number of the component Note: The component class is described in F01375.</td>
<td>Adapting the topologies: - change over the actual topology to match the target topology. - download the target topology that matches the actual topology (commissioning software). Re byte cc: cc = 1 --&gt; can be acknowledged using p9904 or p9905. cc &gt; 1 --&gt; can be acknowledged using p9905 and can be de-activated using p9906 or p9907/p9908. Note: Under &quot;Topology --&gt; Topology view&quot; the commissioning software where relevant offers improved diagnostics capability (e.g. setpoint/actual value comparison). See also: p9904 (Topology comparison, acknowledge differences), p9905 (Device specialization)</td>
<td></td>
</tr>
<tr>
<td>F01451</td>
<td>Topology: Target topology is invalid</td>
<td>%1</td>
<td>All objects</td>
<td>NONE</td>
<td>IMMEDIATELY</td>
<td>An error was detected in the target topology. The target topology is invalid.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Fault value (r0949, interpret hexadecimal):
ccccbbbaa hex: cccc = index error, bb = component number, aa = fault cause
aa = 1B hex = 27 dec: Error not specified.
aa = 1C hex = 28 dec: Value illegal.
aa = 1D hex = 29 dec: Incorrect ID.
aa = 1E hex = 30 dec: Incorrect ID length.
aa = 1F hex = 31 dec: Too few indices left.
aa = 20 hex = 32 dec: component not connected to Control Unit.

Remedy:
Reload the target topology using the commissioning software.

---

**F01475 Topology: Target topology duplicate connection between two components**

**Message value:** Component number: %1, Component class: %2, Connection number1: %3, Connection number2: %4

**Drive object:** CU_S110-CAN, CU_S110-DP, CU_S110-PN

**Reaction:** NONE

**Acknowledge:** IMMEDIATELY

**Cause:** When writing the target topology, a duplicate connection between two components was detected.

Fault value (r0949, interpret hexadecimal):

ddccbbaa hex:

dd = connection number 2 of the duplicate connection
cc = connection number 1 of the duplicate connection
bb = component class
aa = component number of one of the components connected twice

Note:
Component class and connection number are described in F01375.

**Remedy:**
Read out the fault value and remove one of the two specified connections.
Then download the target topology again using the commissioning software.

Note:
Under "Topology --> Topology view" the commissioning software where relevant offers improved diagnostics capability (e.g. setpoint/actual value comparison).

---

**A01481 Topology: Comparison power unit missing in the actual topology**

**Message value:** Component number: %1

**Drive object:** All objects

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:** The topology comparison has detected a power unit in the target topology that is not available in the actual topology.

Alarm value (r2124, interpret decimal):
Component number of the additional target components.

**Remedy:**
- delete the drive belonging to the power unit in the commissioning software project and download the new configuration to the drive unit.
- check that the actual topology matches the target topology and if required, change over.
- check DRIVE-CLiQ cables for interruption and contact problems.
- check the 24 V supply voltage.
- check that the power unit is working properly.

Note:
Under "Topology --> Topology view" the commissioning software where relevant offers improved diagnostics capability (e.g. setpoint/actual value comparison).

---

**A01482 Topology: Comparison Sensor Module missing in the actual topology**

**Message value:** Component number: %1

**Drive object:** All objects

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:** The topology comparison has detected a Sensor Module in the target topology that is not available in the actual topology.

Alarm value (r2124, interpret decimal):
Component number of the additional target components.
Faults and alarms

List of faults and alarms

Remedy: - re-configure the drive belonging to the Sensor Module in the commissioning software project (encoder configuration) and download the new configuration to the drive unit.
- check the actual topology matches the target topology and if required, change over.
- check DRIVE-CLiQ cables for interruption and contact problems.
- check the 24 V supply voltage.
- check that the Sensor Module is working properly.

Note: Under "Topology --> Topology view" the commissioning software where relevant offers improved diagnostics capability (e.g. setpoint/actual value comparison).

A01483 Topology: Comparison Terminal Module missing in the actual topology
Message value: Component number: %1
Drive object: CU_S110-CAN, CU_S110-DP, CU_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: The topology comparison has detected a Terminal Module in the target topology that is not available in the actual topology.
Alarm value (r2124, interpret decimal):
Component number of the additional target components.
Remedy: - delete the Terminal Module in the commissioning software project and download the new configuration to the drive unit.
- check that the actual topology matches the target topology and if required, change over.
- check DRIVE-CLiQ cables for interruption and contact problems.
- check the 24 V supply voltage.
- check that the Terminal Module is working properly.
Note: Under "Topology --> Topology view" the commissioning software where relevant offers improved diagnostics capability (e.g. setpoint/actual value comparison).

A01484 Topology: Comparison DRIVE-CLiQ Hub Module missing in the actual topology
Message value: Component number: %1
Drive object: CU_S110-CAN, CU_S110-DP, CU_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: The topology comparison has detected a DRIVE-CLiQ Hub Module in the target topology that does not exist in the actual topology.
Alarm value (r2124, interpret decimal):
Component number of the additional target components.
Remedy: - delete the DRIVE-CLiQ Hub Module in the commissioning software project and download the new configuration to the drive unit.
- check that the actual topology matches the target topology and if required, change over.
- check DRIVE-CLiQ cables for interruption and contact problems.
- check the 24 V supply voltage.
- test the DRIVE-CLiQ Hub Module to ensure that it functions properly.
Note: Under "Topology --> Topology view" the commissioning software where relevant offers improved diagnostics capability (e.g. setpoint/actual value comparison).

A01486 Topology: Comparison DRIVE-CLiQ components missing in the actual topology
Message value: Component number: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The topology comparison has detected a DRIVE-CLiQ component in the target topology that is not available in the actual topology.
Alarm value (r2124, interpret decimal):
Component number of the additional target components.
Remedy:
- delete the drive belonging to this component in the commissioning software project and download the new configuration to the drive unit.
- re-configure the drive belonging to this component in the commissioning software project and download the new configuration to the drive unit.
- check that the actual topology matches the target topology and if required, change over.
- check DRIVE-CLiQ cables for interruption and contact problems.
- check the 24 V supply voltage.
- check that the component is working properly.
Note:
Under "Topology --> Topology view" the commissioning software where relevant offers improved diagnostics capability (e.g. setpoint/actual value comparison).

A01487 Topology: Comparison option slot components missing in the actual topology
Message value: Component number: %1
Drive object: CU_S110-CAN, CU_S110-DP, CU_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: The topology comparison has detected an option slot module in the target topology that is not available in the actual topology.
Alarm value (r2124, interpret decimal):
Component number of the additional target components.
Remedy:
- delete the option board in the commissioning software project and download the new configuration to the drive unit.
- re-configure the drive unit in the commissioning software project and download the new configuration to the drive unit.
- check that the actual topology matches the target topology and if required, change over.
- check that the option board is functioning correctly
Note:
Under "Topology --> Topology view" the commissioning software where relevant offers improved diagnostics capability (e.g. setpoint/actual value comparison).

A01488 Topology: Comparison EnDat encoder missing in the actual topology
Message value: Component number: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The topology comparison has detected an EnDat encoder in the target topology that is not available in the actual topology.
Alarm value (r2124, interpret decimal):
Component number of the additional target components.
Remedy:
- re-configure the drive belonging to the encoder in the commissioning software project (encoder configuration) and download the new configuration to the drive unit.
- delete the drive belonging to the encoder in the commissioning software project and download the new configuration to the drive unit.
- check that the actual topology matches the target topology and if required, change over.
Note:
Under "Topology --> Topology view" the commissioning software where relevant offers improved diagnostics capability (e.g. setpoint/actual value comparison).

A01489 Topology: Comparison motor with DRIVE-CLiQ missing in the actual topology
Message value: Component number: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The topology comparison has detected a motor with DRIVE-CLiQ in the target topology that is not available in the actual topology.
Alarm value (r2124, interpret decimal):
Component number of the additional target components.
Faults and alarms

List of faults and alarms

Remedy:
- re-configure the drive belonging to this motor in the commissioning software project and download the new configuration to the drive unit.
- check that the actual topology matches the target topology and if required, change over.
- check DRIVE-CLiQ cables for interruption and contact problems.
- check that the motor is working properly.

Note:
Under “Topology --> Topology view” the commissioning software where relevant offers improved diagnostics capability (e.g. setpoint/actual value comparison).

F01505 (A) BICO: Interconnection cannot be established
Message value: Parameter: %1
Drive object: All objects
Reaction: NONE
Acknowledge: IMMEDIATELY
Cause: A PROFdrive telegram has been set (p0922).
An interconnection contained in the telegram was not able to be established.
Fault value (r0949, decimal interpretation): Parameter receiver that should be changed.
Remedy: Establish another interconnection.
Reaction upon A: NONE
Acknowl. upon A: NONE

A01507 (F, N) BICO: Interconnections to inactive objects present
Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: There are BICO interconnections as signal sink from a drive object that is either inactive/not operational.
The BI/CI parameters involved are listed in r9498.
The associated BO/CO parameters are listed in r9499.
The list of the BICO interconnections to other drive objects is displayed in r9491 and r9492 of the de-activated drive object.
Note: r9498 and r9499 are only written to, if p9495 is not set to 0.
Alarm value (r2124, interpret decimal): Number of BICO interconnections found to inactive drive objects.
Remedy: - set all open BICO interconnections centrally to the factory setting with p9495 = 2.
- make the non-operational drive object active/operational again (re-insert or activate components).
Reaction upon F: OFF2 (ENCODER, IASC/DCBR AKE, NONE, OFF1, OFF3, STOP1, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

A01508 BICO: Interconnections to inactive objects exceeded
Message value: 
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The maximum number of BICO interconnections (signal sinks) when de-activating a drive object was exceeded.
When de-activating a drive object, all BICO interconnections (signal sinks) are listed in the following parameters:
- r9498[0...29]: List of the BI/CI parameters involved.
- r9499[0...29]: List of the associated BO/CO parameters.
Remedy: The alarm automatically disappears as soon as no BICO interconnection (value = 0) is entered in r9498[29] and r9499[29].
Notice: When re-activating the drive object, all BICO interconnections should be checked and if required, re-established.
<table>
<thead>
<tr>
<th>Fault Code</th>
<th>Description</th>
<th>Message Value</th>
<th>Drive Object</th>
<th>Reaction</th>
<th>Acknowledge</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>F01510</td>
<td>BICO: Signal source is not float type</td>
<td>Parameter: %1</td>
<td>All objects</td>
<td>NONE</td>
<td>IMMEDIATELY</td>
<td>The requested connector output does not have the correct data type. This interconnection is not established.</td>
<td>Interconnect this connector input with a connector output having a float data type.</td>
</tr>
<tr>
<td>F01511 (A)</td>
<td>BICO: Interconnection with different scalings</td>
<td>Parameter: %1</td>
<td>All objects</td>
<td>NONE</td>
<td>IMMEDIATELY</td>
<td>The requested BICO interconnection was established. However, a conversion is made between the BICO output and BICO input using the reference values.</td>
<td>Not necessary.</td>
</tr>
<tr>
<td>F01512</td>
<td>BICO: No scaling available</td>
<td>%1</td>
<td>All objects</td>
<td>OFF2</td>
<td>POWER ON</td>
<td>An attempt was made to determine a conversion factor for a scaling that does not exist.</td>
<td>Apply scaling or check the transfer value.</td>
</tr>
<tr>
<td>F01513 (A)</td>
<td>BICO: Interconnection cross DO with different scalings</td>
<td>Parameter: %1</td>
<td>All objects</td>
<td>NONE</td>
<td>IMMEDIATELY</td>
<td>The requested BICO interconnection was established. However, a conversion is made between the BICO output and BICO input using the reference values.</td>
<td></td>
</tr>
</tbody>
</table>
Example 2:
BICO output with voltage normalized unit in drive object 1 (DO1), BICO input with voltage normalized unit in drive object 2 (DO2). The reference values for voltage (p2001) of the two drive objects have different values. This means that the factor p2001(DO1)/p2001(DO2) is calculated between the BICO output and the BICO input.
p2001: contains the reference value for voltage, drive objects 1, 2

Fault value (r0949, decimal interpretation):
Parameter number of the BICO input (signal sink).

Remedy: Not necessary.
Reaction upon A: NONE
Acknowl. upon A: NONE

A01514 (F) BICO: Error when writing during a reconnect
Message value: Parameter: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: During a reconnect operation (e.g. while booting or downloading - but can also occur in normal operation) a parameter was not able to be written to.
Example:
When writing to a double word BICO input in the second index, the memory areas overlap (e.g. p8861). The parameter is then reset to the factory setting.
Alarm value (r2124, interpret decimal):
Parameter number of the BICO input (signal sink).
Remedy: Not necessary.
Reaction upon F: NONE
Acknowl. upon F: IMMEDIATELY

F01515 (A) BICO: Writing to parameter not permitted as the master control is active
Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: IMMEDIATELY
Cause: When changing the number of CDS or when copying from CDS, the master control is active.
Remedy: If required, return the master control and repeat the operation.
Reaction upon A: NONE
Acknowl. upon A: NONE

A01590 (F) Drive: Motor maintenance interval expired
Message value: Fault cause: %1 bin
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: The selected service/maintenance interval for this motor was reached.
Alarm value (r2124, interpret decimal):
Motor data set number.
See also: p0650 (Actual motor operating hours), p0651 (Motor operating hours maintenance interval)
Remedy: carry out service/maintenance and reset the service/maintenance interval (p0651).
Reaction upon F: NONE
Acknowl. upon F: IMMEDIATELY
F01600  SI CU: STOP A initiated

Message value:  %1

Drive object:  SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

Reaction:  OFF2

Acknowledge:  IMMEDIATELY (POWER ON)

Cause:  The drive-integrated "Safety Integrated" function on the Control Unit (CU) has detected a fault and initiated a STOP A (pulse suppression via the safety shutdown path of the Control Unit).
- forced checking procedure of the safety shutdown path of the Control Unit unsuccessful.
- subsequent response to fault F01611 (defect in a monitoring channel).

Fault value (r0949, decimal interpretation):
0: Stop request from the Motor Module.
1005: Pulses suppressed although STO not selected and there is no internal STOP A present.
1010: Pulses enabled although STO is selected or an internal STOP A is present.
1015: Feedback of the safe pulse suppression for Motor Modules connected in parallel are different.
9999: Subsequent response to fault F01611.

Remedy:
- select Safe Torque Off and de-select again.
- replace the Motor Module involved.

For fault value = 9999:
- carry out diagnostics for fault F01611.

Note:
CU: Control Unit
MM: Motor Module
SI: Safety Integrated
STO: Safe Torque Off / SH: Safe standstill

F01611  SI CU: Defect in a monitoring channel

Message value:  %1

Drive object:  SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

Reaction:  NONE (OFF1, OFF2, OFF3)

Acknowledge:  IMMEDIATELY (POWER ON)

Cause:  The drive-integrated "Safety Integrated" function on the Control Unit (CU) has detected a fault in the crosswise data comparison between the CU and Motor Module (MM) and initiated a STOP F.
As a result of this fault, after the parameterized transition has expired (p9658), fault F01600 (SI CU: STOP A initiated) is output.

Fault value (r0949, decimal interpretation):
0: Stop request from the Motor Module.
1 ... 999: Number of the cross-checked data that resulted in this fault. This number is also displayed in r9795.
1: SI monitoring clock cycle (r9780, r9880).
2: SI enable safety functions (p9801, p9801). Crosswise data comparison is only carried out for the supported bits.
3: SI SGE changeover tolerance time (p9650, p9850).
4: SI transition period STOP F to STOP A (p9658, p9858).
5: SI enable Safe Brake Control (p9602, p9802).
6: SI Motion enable, safety-relevant functions (p9501, internal value).
7: SI pulse suppression delay time for Safe Stop 1 (p9652, p9852).
8: SI PROFIsafe address (p9610, p9810).
9: SI debounce time for STO/SBC/SS1 (MM) (p9651, p9851).
10: SI delay time for pulse suppression for ESR (p9697, p9697).
11: SI Safe Brake Adapter mode, BICO interconnection (p9621, p9821).
12: SI Safe Brake Adapter relay ON time (p9622[0], p9822[0]).
13: SI Safe Brake Adapter relay OFF time (p9622[1], p9822[1]).
1000: Watchdog timer has expired. Within the time of approx. 5 x p9650 too many switching operations have occurred at terminal EP of the Motor Module, or STO (also as subsequent response) was initiated too frequently via PROFIsafe/TM54F.
1001, 1002: Initialization error, change timer / check timer.
1900: CRC error in the SAFETY sector.
1901: CRC error in the ITCM sector.
1902: Overloading in the ITCM sector has occurred in operation.
1950: Module temperature outside the permissible temperature range.
1951: Module temperature not plausible.
2000: Status of the STO selection on the Control Unit and Motor Module are different.
Faults and alarms

List of faults and alarms

2001: Feedback signal for safe pulse suppression on the Control Unit and Motor Module are different.
2002: Status of the delay timer SS1 on the Control Unit and Motor Module are different.
2004: Status of the STO selection for modules connected in parallel are different.
2005: Feedback signal of the safe pulse suppression on the Control Unit and Motor Modules connected in parallel are different.
6000 ... 6999:
Error in the PROFI-safe control.
For these fault values, the failsafe control signals (failsafe values) are transferred to the safety functions.
The significance of the individual message values is described in safety message C01711 of the Control Unit.

Remedy:

Re fault value = 1 ... 5 and 7 ... 999:
- check the cross-checked data that resulted in a STOP F.
- carry out a POWER ON (power off/on) for all components.
- upgrade the Motor Module software.
- upgrade the Control Unit software.
For fault value = 6:
- carry out a POWER ON (power off/on) for all components.
- upgrade the Motor Module software.
- upgrade the Control Unit software.
For fault value = 1000:
- check the EP terminal at the Motor Module (contact problems).
- PROFIsafe: Remove contact problems/faults at the PROFIBUS master/PROFINET controller.
- check the wiring of the failsafe inputs at the TM54F (contact problems).
Re fault value = 1001, 1002:
- carry out a POWER ON (power off/on) for all components.
- upgrade the Motor Module software.
- upgrade the Control Unit software.
Re fault value = 1900, 1901, 1902:
- carry out a POWER ON (power off/on) for all components.
- upgrade the Control Unit software.
- replace Control Unit.
- check the tolerance time SGE changeover and if required, increase the value (p9650/p9850, p9652/p9852).
- check the wiring of the safety-relevant inputs (SGE) (contact problems).
- check the causes of the STO selection in r9772. When the SMM functions are active (p9501 = 1), STO can also be selected using these functions.
- replace the Motor Module involved.
Re fault value = 6000 ... 6999:
Refer to the description of the message values in safety message C01711.

Note:
CU: Control Unit
EP: Enable Pulses (pulse enable)
MM: Motor Module
SGE: Safety-relevant input
SI: Safety Integrated
SMM: Safe Motion Monitoring
SS1: Safe Stop 1 (corresponds to Stop Category 1 acc. to EN60204)
STO: Safe Torque Off / SH: Safe standstill
ESR: Extended Stop and Retract

F01612 SI CU: STO inputs for power units connected in parallel different

Message value: Fault cause: %1 bin
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE (OFF1, OFF2, OFF3)
Acknowledge: IMMEDIATELY (POWER ON)
Cause: The drive-integrated "Safety Integrated" function on the Control Unit (CU) has identified different states of the AND’ed STO inputs for power units connected in parallel and has initiated a STOP F.
As a result of this fault, after the parameterized transition has expired (p9658), fault F01600 (SI CU: STOP A initiated) is output.
Fault value (r0949, interpret binary):
Binary image of the digital inputs of the Control Unit that are used as signal source for the function "Safe Torque Off".
Remedy: - check the tolerance time SGE changeover and if required, increase the value (p9650).
- check the wiring of the safety-relevant inputs (SGE) (contact problems).

Note:
CU: Control Unit
SGE: Safety-relevant input
SI: Safety Integrated
STO: Safe Torque Off / SH: Safe standstill

N01620 (F, A)  SI CU: Safe Torque Off active
Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: The "Safe Torque Off" (STO) function has been selected on the Control Unit (CU) using the input terminal and is active.
Note: This message does not result in a safety stop response.
Remedy: Not necessary.
Note:
CU: Control Unit
SI: Safety Integrated
STO: Safe Torque Off / SH: Safe standstill

Reaction upon F: OFF2
Acknowl. upon F: IMMEDIATELY (POWER ON)
Reaction upon A: NONE
Acknowl. upon A: NONE

N01621 (F, A)  SI CU: Safe Stop 1 active
Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: The "Safe Stop 1" (SS1) function has been selected on the Control Unit (CU) and is active.
Note: This message does not result in a safety stop response.
Remedy: Not necessary.
Note:
CU: Control Unit
SI: Safety Integrated
SS1: Safe Stop 1 (corresponds to Stop Category 1 acc. to EN60204)

Reaction upon F: OFF3
Acknowl. upon F: IMMEDIATELY (POWER ON)
Reaction upon A: NONE
Acknowl. upon A: NONE

F01625  SI CU: Sign-of-life error in safety data
Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF2
Acknowledge: IMMEDIATELY (POWER ON)
Cause: The drive-integrated "Safety Integrated" function on the Control Unit (CU) has detected an error in the sign-of-life of the safety data between the CU and Motor Module (MM) and initiated a STOP A.
- there is either a DRIVE-CLiQ communication error or communication has failed.
- a time slice overflow of the safety software has occurred.
Fault value (r0949, decimal interpretation):
Only for internal Siemens troubleshooting.
**Faults and alarms**

**List of faults and alarms**

| Remedy: | - select Safe Torque Off and de-select again.  
|         | - carry out a POWER ON (power off/on) for all components.  
|         | - check whether there is a DRIVE-CLiQ communication error between the Control Unit and the Motor Module involved and, if required, carry out a diagnostics routine for the faults identified.  
|         | - de-select all drive functions that are not absolutely necessary.  
|         | - reduce the number of drives.  
|         | - check the electrical cabinet design and cable routing for EMC compliance  
| Note:  | CU: Control Unit  
|        | MM: Motor Module  
|        | SI: Safety Integrated

**F01630**

**SI CU: Brake control error**

**Message value:** 1

**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

**Reaction:** OFF2

**Acknowledge:** IMMEDIATELY (POWER ON)

**Cause:** The drive-integrated "Safety Integrated" function on the Control Unit (CU) has detected a brake control fault and initiated a STOP A.  
Fault value (r0949, decimal interpretation):  
- Fault value = 10, 11:  
  - Fault in "open holding brake" operation.  
  - Parameter p1278 incorrectly set.  
  - No brake connected or wire breakage (check whether brake releases for p1278 = 1 and p9602/p9802 = 0 (SBC deactivated)).  
  - Ground fault in brake cable.  
  - Short-circuit in brake winding.  
  - Re fault value = 30, 31:  
    - Fault in "close holding brake" operation.  
    - No brake connected or wire breakage (check whether brake releases for p1278 = 1 and p9602/p9802 = 0 (SBC deactivated)).  
    - Short-circuit in brake winding.  
- For fault value = 40:  
  - Fault in "brake closed" state.  
  - Re fault value = 50:  
    - Fault in the brake control circuit of the Control Unit or communication fault between the Control Unit and Motor Module (brake control).  
    - For fault value = 80:  
      - SafeBrakeAdapter: Fault in the brake control circuit of the Control Unit or communication fault between Control Unit and Motor Module (brake control diagnostics).  
      - The following causes may apply to fault values:  
        - motor cable is not shielded correctly.  
        - Defect in control circuit of the Motor Module.  

**Remedy:**  
- check parameter p1278 (for SBC, only p1278 = 0 is permissible).  
- select Safe Torque Off and de-select again.  
- check the motor holding brake connection.  
- check the function of the motor holding brake.  
- check whether there is a DRIVE-CLiQ communication error between the Control Unit and the Motor Module involved and, if required, carry out a diagnostics routine for the faults identified.  
- check that the electrical cabinet design and cable routing are in compliance with EMC regulations (e.g. shield of the motor cable and brake conductors are connected with the shield connecting plate and the motor connectors are tightly screwed to the housing).  
- replace the Motor Module involved.  

Operation with Safe Brake Module or Safe Brake Adapter:  
- check the Safe Brake Module or Safe Brake Adapter connection.  
- replace the Safe Brake Module or Safe Brake Adapter.
### F01649 SI CU: Internal software error

**Message value:** %1

**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

**Reaction:** OFF2

**Acknowledge:** IMMEDIATELY (POWER ON)

**Cause:** An internal error in the Safety Integrated software on the Control Unit has occurred.

Note: This fault results in a STOP A that cannot be acknowledged.

Fault value (r0949, interpret hexadecimal):
Only for internal Siemens troubleshooting.

**Remedy:**
- carry out a POWER ON (power off/on) for all components.
- re-commission the "Safety Integrated" function and carry out a POWER ON.
- Upgrade the firmware of the Control Unit to a later version.
- contact the Hotline.
- replace the Control Unit.

### F01650 SI CU: Acceptance test required

**Message value:** %1

**Drive object:** All objects

**Reaction:** OFF2

**Acknowledge:** IMMEDIATELY (POWER ON)

**Cause:** The drive-integrated "Safety Integrated" function on the Control Unit requires an acceptance test.

Note: This fault results in a STOP A that can be acknowledged.

Fault value (r0949, decimal interpretation):
130: Safety parameters for the Motor Module not available.

Note: This fault value is always output when Safety Integrated is commissioned for the first time.

1000: Reference and actual checksum on the Control Unit are not identical (booting).
- at least one checksum-checked piece of data is defective.

2000: Reference and actual checksum on the Control Unit are not identical (commissioning mode).
- reference checksum incorrectly entered into the Control Unit (p9799 not equal to r9798).
- when de-activating the safety functions, p9501 or p9503 were not deleted.

2001: Reference and actual checksum on the Motor Module are not identical (commissioning mode).
- reference checksum incorrectly entered into the Motor Module (p9899 not equal to r9898).
- when de-activating the safety functions, p9501 or p9503 are not deleted.

2002: Enable of safety-related functions between the Control Unit and Motor Module differ (p9601 not equal to p9801).

2003: Acceptance test is required as a safety parameter has been changed.

2004: An acceptance test is required because a project with enabled safety-functions has been downloaded.

2005: The Safety logbook has identified that a functional safety checksum has changed. An acceptance test is required.

2010: Safe Brake Control is enabled differently between the Control Unit and Motor Module (p9602 not equal to p9802).

3003: Acceptance test is required as a hardware-related safety parameter has been changed.

3005: The Safety logbook has identified that a hardware-related safety checksum has changed. An acceptance test is required.

9999: Subsequent response of another safety-related fault that occurred when booting that requires an acceptance test.
Faults and alarms

List of faults and alarms

Remedy:

For fault value = 130:
- carry out safety commissioning routine.
For fault value = 1000:
- again carry out safety commissioning routine.
- replace the memory card or Control Unit.
For fault value = 2000:
- check the safety parameters in the Control Unit and adapt the reference checksum (p9799).
For fault value = 2001:
- check the safety parameters in the Motor Module and adapt the reference checksum (p9899).
For fault value = 2002:
- enable the safety-related functions in the Control Unit and check in the Motor Module (p9601 = p9801).
For fault value = 2003, 2004, 2005:
- Carry out an acceptance test and generate an acceptance report.

The procedure when carrying out an acceptance test as well as an example of the acceptance report are provided in the following literature:
SINAMICS S120 Function Manual Safety Integrated
The fault with fault value 2005 can only be acknowledged when the "STO" function is de-selected.
For fault value = 2010:
- check enable of the safety-related brake control in the Control Unit and Motor Module (p9602 = p9802).
For fault value = 2020:
- again carry out safety commissioning routine.
- replace the memory card or Control Unit.
For fault value = 3003:
- carry out the function checks for the modified hardware and generate an acceptance report.

The procedure when carrying out an acceptance test as well as an example of the acceptance report are provided in the following literature:
SINAMICS S120 Function Manual Safety Integrated
For fault value = 3005:
- carry out the function checks for the modified hardware and generate an acceptance report.
The fault with fault value 3005 can only be acknowledged when the "STO" function is de-selected.
For fault value = 9999:
- carry out diagnostics for the other safety-related fault that is present.

Note:
CU: Control Unit
MM: Motor Module
SI: Safety Integrated
STO: Safe Torque Off
See also: p9799 (SI reference checksum SI parameters (Control Unit)), p9899 (SI setpoint checksum SI parameters (processor 2))

F01651 SI CU: Synchronization safety time slices unsuccessful

Message value:
%1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: IMMEDIATELY (POWER ON)
Acknowledge: OFF2
Cause:
The "Safety Integrated" function requires a synchronization of the safety time slices between the Control Unit (CU) and Motor Module (MM) and between the Control Unit and the higher-level control. This synchronization routine was unsuccessful.
Note:
This fault results in a STOP A that cannot be acknowledged.
Fault value (r0949, decimal interpretation):
121:
- with SINUMERIK Safety Integrated enabled, a drive-side warm restart was performed on the CU/NX.
- with SINUMERIK Safety Integrated enabled, the function "restore factory setting" was selected on a drive object of the CU and a drive-side warm restart was initiated.
150:
- fault in the synchronization to the PROFIBUS master.
All other values:
- only for internal Siemens troubleshooting.
See also: p9510 (SI Motion clock-cycle synchronous PROFIBUS master)
Faults and alarms

List of faults and alarms

Remedy:
For fault value = 121:
- carry out a common POWER ON/warm restart for the higher-level control and SINAMICS.
For fault value = 150:
- check the setting of p9510 (SI Motion clock-cycle synchronous PROFIBUS master) and if required, correct.
General:
- carry out a POWER ON (power off/on) for all components.
- upgrade the Motor Module software.
- upgrade the Control Unit software.
- upgrade the software of the higher-level control.
Note:
CU: Control Unit
MM: Motor Module
SI: Safety Integrated

F01652 SI CU: Illegal monitoring clock cycle
Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF2
Acknowledge: IMMEDIATELY (POWER ON)
Cause:
One of the Safety Integrated monitoring clock cycles is not permissible:
- the monitoring clock cycle integrated in the drive cannot be maintained due to the communication conditions required in the system.
- the monitoring clock cycle for safe motion monitoring functions with the higher-level control is not permissible (p9500).
- The sampling time for the current controller (p0112, p0115) cannot be supported.
Note:
This fault results in a STOP A that cannot be acknowledged.
Remedy:
For enabled SI monitoring integrated in the drive (p9601/p9801 > 0):
- upgrade the Control Unit software.
For enabled motion monitoring function (p9501 > 0):
- correct the monitoring clock cycle (p9500) and carry out POWER ON.
For fault value = 101:
- actual value sensing clock cycle corresponds to position control clock cycle/DP clock cycle (factory setting).
- for motion monitoring functions integrated in the drive (p9601/p9801 > 0) the actual value sensing clock cycle can be directly parameterized in P9511/p9311.
Faults and alarms

List of faults and alarms

Re fault value = 104, 105:
- set a separate actual value sensing clock cycle in p9511.
- restrict operation to a maximum of two vector drives. For the standard setting in p0112, p0115, the current controller sampling time is automatically reduced to 250 µs. If the standard values were changed, then the current controller sampling time (p0112, p0115) should be appropriately set.
- increase the DP clock cycle for operation with a clock-cycle synchronous PROFIBUS so that there is a multiple clock cycle ratio of at least 4:1 between the DP clock cycle and the current controller sampling time. A clock cycle ratio of at least 8:1 is recommended.
- With firmware version 2.5, please ensure that parameter p9510 is set to 1 in the drive (clock cycle synchronous operation).

For fault value = 106:
- set the parameters for the monitoring clock cycles the same (p10000 and p9500 / p9300).

For fault value = 107:
- set an actual value sensing clock cycle in p9511 that matches the current controller clock cycle. A clock cycle ratio of at least 8:1 is recommended.

For fault value = 108:
- set a suitable actual value sensing clock cycle in p9511.
- if the DP clock cycle is used as the actual value sensing clock cycle for operation with isochronous PROFIBUS (p9511 = 0), then a suitable DP clock cycle must be configured. A suitable multiple of the DP clock cycle (e.g. 1, 2, 3, 4, 5, 6, 8, 10) must be parameterized on the D410. Otherwise, the clock cycle must be set to less than 8 ms.

For fault value = 109:
- set the actual value sensing clock cycle in p9511 to the same value as the current controller clock cycle (p115).

For fault value = 110:
- set the actual value sensing clock cycle in p9511 to 2 ms or higher.

Note:
- CU: Control Unit
- MM: Motor Module
- SI: Safety Integrated

<table>
<thead>
<tr>
<th>F01653</th>
<th>SI CU: PROFIBUS configuration error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message value:</td>
<td>%1</td>
</tr>
<tr>
<td>Drive object:</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
</tr>
<tr>
<td>Reaction:</td>
<td>NONE (OFF1, OFF2, OFF3)</td>
</tr>
<tr>
<td>Acknowledge:</td>
<td>IMMEDIATELY (POWER ON)</td>
</tr>
<tr>
<td>Cause:</td>
<td>There is a PROFIBUS configuration error for using Safety Integrated monitoring functions with a higher-level control (SINUMERIK or F-PLC).</td>
</tr>
</tbody>
</table>
| Note:          | For safety functions that have been enabled, this fault results in a STOP A that cannot be acknowledged. Fault value (r0949, decimal interpretation):
| 200:          | A safety slot for receive data from the control has not been configured. |
| 210, 220:     | The configured safety slot for the receive data from the control has an unknown format. |
| 230:          | The configured safety slot for the receive data from the F-PLC has the incorrect length. |
| 231:          | The configured safety slot for the receive data from the F-PLC has the incorrect length. |
| 240:          | The configured safety slot for the receive data from the SINUMERIK has the incorrect length. |
| 250:          | A PROFIsafe slot is configured in the higher-level F control, however PROFIsafe is not enabled in the drive. |
| 300:          | A safety slot for the send data to the control has not been configured. |
| 310, 320:     | The configured safety slot for the send data to the control has an unknown format. |
| 330:          | The configured safety slot for the send data to the F-PLC has the incorrect length. |
| 331:          | The configured safety slot for the send data to the F-PLC has the incorrect length. |
| 340:          | The configured safety slot for the send data to the SINUMERIK has the incorrect length. |

Remedy:
The following generally applies:
- check and, if necessary, correct the PROFIBUS configuration of the safety slot on the master side.
- upgrade the Control Unit software.

For fault value = 250:
- remove the PROFIsafe configuring in the higher-level F control or enable PROFIsafe in the drive.
Re fault value = 231, 331:
- configure the PROFIsafe telegram matching the parameterization in the F-PLC.
The following applies for p9501.30 = 1 (F-DI via PROFIsafe is enabled): PROFIsafe telegram 900 must be configured.
The following applies for p9501.30 = 0 (F-DI via PROFIsafe is not enabled): PROFIsafe telegram 30 must be configured.
### F01655: SI CU: Align monitoring functions

**Message value:** %1  
**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
**Reaction:** OFF2  
**Acknowledge:** IMMEDIATELY (POWER ON)  
**Cause:** An error has occurred when aligning the Safety Integrated monitoring functions on the Control Unit (CU) and Motor Module (MM). Control Unit and Motor Module were not able to determine a common set of supported SI monitoring functions.  
- there is either a DRIVE-CLIQ communication error or communication has failed.  
- Safety Integrated software releases on the Control Unit and Motor Module are not compatible with one another.  
**Note:** This fault results in a STOP A that cannot be acknowledged.  
**Fault value (r0949, interpret hexadecimal):** Only for internal Siemens troubleshooting.  
**Remedy:**  
- carry out a POWER ON (power off/on) for all components.  
- upgrade the Motor Module software.  
- upgrade the Control Unit software.  
- check the electrical cabinet design and cable routing for EMC compliance  
**Note:**  
CU: Control Unit  
MM: Motor Module  
SI: Safety Integrated

### F01656: SI CU: Motor Module parameter error

**Message value:** %1  
**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
**Reaction:** OFF2  
**Acknowledge:** IMMEDIATELY (POWER ON)  
**Cause:** When accessing the Safety Integrated parameters for the Motor Module (MM) in the non-volatile memory, an error has occurred.  
**Note:** This fault results in a STOP A that can be acknowledged.  
**Fault value (r0949, decimal interpretation):**  
129:  
- safety parameters for the Motor Module corrupted.  
- drive with enabled safety functions was possibly copied offline using the commissioning software and the project downloaded.  
131: Internal Motor Module software error.  
132: Communication errors when uploading or downloading the safety parameters for the Motor Module.  
255: Internal software error on the Control Unit.  
**Remedy:**  
- re-commission the safety functions.  
- upgrade the Control Unit software.  
- upgrade the Motor Module software.  
- replace the memory card or Control Unit.  
For fault value = 129:  
- activate the safety commissioning mode (p0010 = 95).  
- adapt the PROFIsafe address (p9610).  
- start the copy function for SI parameters (p9700 = D0 hex).  
- acknowledge data change (p9701 = DC hex).  
- exit the safety commissioning mode (p0010 = 0).  
- save all parameters (p0977 = 1 or "copy RAM to ROM").  
- carry out a POWER ON (power off/on) for all components.  
For fault value = 132:  
- check the electrical cabinet design and cable routing for EMC compliance  
**Note:**  
CU: Control Unit  
MM: Motor Module  
SI: Safety Integrated
## F01659 SI CU: Write request for parameter rejected

| Message value: | %1 |
| Drive object: | SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN |
| Reaction: | OFF2 |
| Acknowledge: | IMMEDIATELY (POWER ON) |
| Cause: | The write request for one or several Safety Integrated parameters on the Control Unit (CU) was rejected. Note: This fault does not result in a safety stop response. Fault value (r0949, decimal interpretation): 1: The Safety Integrated password is not set. 2: A reset of the drive parameters was selected. However, the Safety Integrated parameters were not reset, as Safety Integrated is presently enabled. 3: The interconnected STO input is in the simulation mode. 10: An attempt was made to enable the STO function although this cannot be supported. 11: An attempt was made to enable the SBC function although this cannot be supported. 12: An attempt was made to enable the SBC function although this cannot be supported for a parallel circuit configuration. 13: An attempt was made to enable the SS1 function although this cannot be supported. 14: An attempt was made to enable the PROFIsafe communication - although this cannot be supported or the version of the PROFIsafe driver used on the CU and MM is different. 15: An attempt was made to enable the motion monitoring functions integrated in the drive although these cannot be supported. 16: An attempt was made to enable the STO function although this cannot be supported when the internal voltage protection (p1231) is enabled. 17: An attempt was made to enable the PROFIsafe function although this cannot be supported for a parallel circuit configuration. 18: An attempt was made to enable the PROFIsafe function for Basic Functions although this cannot be supported. 19: An attempt was made to enable the SBA (Safe Brake Adapter), although this cannot be supported. 20: An attempt was made to enable the motion monitoring functions integrated in the drive and the STO function, both controlled via F-DI. 21: An attempt was made to enable the motion monitoring functions integrated in the drive for a parallel connection, although these cannot be supported. 22: An attempt was made to enable the Safety Integrated functions although these cannot be supported by the connected Power Module. 23: For ESR, an attempt was made to enable the delay for pulse suppression, although this cannot be supported. See also: p0970 (Reset drive parameters), p3900 (Completion of quick commissioning), r9771 (SI common functions (processor 1)), r9871 (SI common functions (processor 2)) |
| Remedy: | For fault value = 1: - set the Safety Integrated password (p9761). For fault value = 2: - Inhibit Safety Integrated (p9501, p9601) or reset safety parameters (p0970 = 5), then reset the drive parameters again. For fault value = 3: - end the simulation mode for the digital input (p0795). Re fault value = 10, 11, 12, 13, 14, 15, 17, 18, 19, 21, 22, 23: - check whether there are faults in the safety function alignment between the Control Unit and the Motor Module involved (F01655, F30655) and if required, carry out diagnostics for the faults involved. - use a Motor Module that supports the required function. - upgrade the Motor Module software. - upgrade the Control Unit software. For fault value = 16: - inhibit the internal voltage protection (p1231). For fault value = 20: - correct setting in p9601. For fault value = 22: - use a Power Module that supports the Safety Integrated functions. Note: CU: Control Unit ESR: Extended Stop and Retract MM: Motor Module SBA: Safe Brake Adapter SBC: Safe Brake Control |
**List of faults and alarms**

**F01660 SI CU: Safety-related functions not supported**

- **Message value:** -
- **Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
- **Reaction:** OFF2
- **Acknowledge:** IMMEDIATELY (POWER ON)
- **Cause:** The Motor Module (MM) does not support the safety-related functions (e.g. the Motor Module version is not the correct one). Safety Integrated cannot be commissioned.
  - Note: This fault does not result in a safety stop response.
- **Remedy:**
  - use a Motor Module that supports the safety-related functions.
  - upgrade the Motor Module software.
  - Note: CU: Control Unit
  - MM: Motor Module
  - SI: Safety Integrated

**F01662 Error internal communications**

- **Message value:** %1
- **Drive object:** All objects
- **Reaction:** OFF2
- **Acknowledge:** POWER ON
- **Cause:** A module-internal communication error has occurred.
  - Fault value (r0949, interpret hexadecimal): Only for internal Siemens troubleshooting.
- **Remedy:**
  - carry out a POWER ON (power off/on).
  - upgrade firmware to later version.
  - contact the Hotline.

**F01663 SI CU: Copying the SI parameters rejected**

- **Message value:** -
- **Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
- **Reaction:** OFF2
- **Acknowledge:** IMMEDIATELY (POWER ON)
- **Cause:** One of the following values is saved in p9700 or was entered offline: 87 or 208.
  - This is the reason that when booting, an attempt is made to copy SI parameters from the Control Unit to the Motor Module. However, no safety-relevant function has been selected on the Control Unit (p9501 = 0, p9601 = 0). This is the reason that copying is not possible.
  - Note: This fault does not result in a safety stop response.
  - See also: p9700 (SI Motion copy function)
- **Remedy:**
  - Set p9700 to 0.
  - Check p9501 and p9601 and if required, correct.
  - Restart the copying function by entering the corresponding value into p9700.

**F01664 SI CU: No automatic firmware update**

- **Message value:** %1
- **Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
- **Reaction:** OFF2
- **Acknowledge:** IMMEDIATELY (POWER ON)
- **Cause:** During booting, the system detected that the "Firmware update automatic" function (p7826 = 1) was not activated.
  - This function must be activated for automatic firmware updates/downgrades to prevent impermissible version combinations when safety functions are enabled.
Faults and alarms

List of faults and alarms

Note:
This fault does not result in a safety stop response.

Remedy:
When safety functions are enabled (p9501 <> 0 and/or p9601 <> 0):
1. Activate the "Firmware update automatic" function (p7826 = 1).
2. Save the parameters (p0977 = 1) and carry out a POWER ON.
When de-activating the safety functions (p9501 = 0, p9601 = 0), the fault can be acknowledged after exiting the safety commissioning mode.

F01665 SI CU: System is defective
Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF2
Acknowledge: IMMEDIATELY
Cause:
A system defect was detected before the last boot or in the actual one. The system might have been rebooted (reset).
Fault value (r0949, interpret hexadecimal):
200000 hex, 400000 hex, 8000yy hex (yy any):
- Fault in the actual booting/operation.
800004 hex:
- Parameters p9500/p9300 are, under certain circumstances, not the same. In addition, Safety message C01711/C30711 is displayed.
Additional values:
- defect before the last time that the system booted.
Remedy:
- carry out a POWER ON (power off/on).
- upgrade firmware to later version.
- contact the Hotline.
Re fault value = 200000 hex, 400000 hex, 8000yy hex (yy any):
- ensure that the Control Unit is connected to the Power Module.
Re fault value = 800004 hex:
- Check that parameters p9500/p9300 are the same.

A01666 (F) SI Motion CU: Steady-state (static) 1 signal at the F-DI for safety-relevant acknowledgement
Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause:
A logical 1 signal is present at the F-DI configured in p10006 for more than 10 seconds.
If, at the F-DI no acknowledgment was performed for safe acknowledgment, then a steady-state logical and 0 signal must be present. This avoids unintentional safety-relevant acknowledgement (or the "Internal Event Acknowledge" signal) if a wire breaks or one of the two digital inputs bounces.
Remedy:
Set the fail-safe digital input (F-DI) to a logical 0 signal (10006).
Note:
F-DI: Failsafe Digital Input

A01669 (F, N) SI Motion: Unfavorable combination of motor and power unit
Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause:
The combination of motor and power unit used is not suitable for using safe motion monitoring functions without an encoder.
Alarm value (r2124, interpret decimal):
Number of the motor data set, which caused the fault.
Remedy:
Use a suitable power unit with a lower power rating or a motor with a higher power rating.
Reaction upon F: NONE (OFF1, OFF2, OFF3)
Acknowl. upon F: IMMEDIATELY (POWER ON)
### List of faults and alarms

#### F01670  
**SI Motion: Invalid parameterization Sensor Module**

<table>
<thead>
<tr>
<th>Message value:</th>
<th>%1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive object:</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
</tr>
<tr>
<td>Reaction:</td>
<td>OFF2</td>
</tr>
<tr>
<td>Acknowledge:</td>
<td>IMMEDIATELY (POWER ON)</td>
</tr>
</tbody>
</table>
| Cause:         | The parameterization of a Sensor Module used for Safety Integrated is not permissible. This fault results in a STOP A that cannot be acknowledged. Fault value (r0949, decimal interpretation):  
1: No encoder was parameterized for Safety Integrated.  
2: An encoder was parameterized for Safety Integrated that does not have an A/B track (sine/cosine).  
3: The encoder data set selected for Safety Integrated is still not valid.  
4: A communication error with the encoder has occurred.  
5: Number of relevant bits in the encoder coarse position invalid.  
6: DRIVE-CLiQ encoder configuration invalid.  
10: For an encoder used for Safety Integrated, not all of the Drive Data Sets (DDS) are assigned to the same Encoder Data Set (EDS) (p0187 ... p0189). |
| Remedy:        | Re fault value = 1, 2:  
- use and parameterize an encoder that Safety Integrated supports (encoder with track A/B sine-wave, p0404.4 = 1).  
For fault value = 3:  
- check whether the drive or drive commissioning function is active and if required, exit this (p0009 = p00010 = 0), save the parameters (p0971 = 1) and carry out a POWER ON  
For fault value = 4:  
- check whether there is a DRIVE-CLiQ communication error between the Control Unit and the Sensor Module involved and if required, carry out a diagnostics routine for the faults identified.  
For fault value = 10:  
- align the EDS assignment of all of the encoders used for Safety Integrated (p0187 ... p0189). |
| Note:          | S!: Safety Integrated |

#### F01671  
**SI Motion: Parameterization encoder error**

<table>
<thead>
<tr>
<th>Message value:</th>
<th>%1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive object:</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
</tr>
<tr>
<td>Reaction:</td>
<td>OFF2</td>
</tr>
<tr>
<td>Acknowledge:</td>
<td>IMMEDIATELY (POWER ON)</td>
</tr>
</tbody>
</table>
| Cause:         | The parameterization of the encoder used by Safety Integrated is different to the parameterization of the standard encoder. This fault does not result in a safety stop response. Fault value (r0949, decimal interpretation):  
Parameter number of the non-corresponding safety parameter. |
| Remedy:        | Align the encoder parameterization between the safety encoder and the standard encoder. |
| Note:          | S!: Safety Integrated |

#### F01672  
**SI CU: Motor Module software/hardware incompatible**

<table>
<thead>
<tr>
<th>Message value:</th>
<th>%1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive object:</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
</tr>
<tr>
<td>Reaction:</td>
<td>OFF2</td>
</tr>
<tr>
<td>Acknowledge:</td>
<td>IMMEDIATELY (POWER ON)</td>
</tr>
</tbody>
</table>
| Cause:         | The existing Motor Module software does not support safe motion monitoring or is not compatible to the software on the Control Unit or there is a communications error between the Control Unit and Motor Module. This fault results in a STOP A that cannot be acknowledged. Fault value (r0949, decimal interpretation):  
1: The existing Motor Module software does not support the safe motion monitoring function. |
| Note:          |
### Faults and alarms

**List of faults and alarms**

<table>
<thead>
<tr>
<th>Fault Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2, 3, 6, 8</td>
<td>There is a communications error between the Control Unit and Motor Module.</td>
</tr>
<tr>
<td>4, 5, 7</td>
<td>The existing Motor Module software is not compatible to the software on the Control Unit.</td>
</tr>
<tr>
<td>9, 10, 11, 12</td>
<td>The actual Motor Module software does not support safe encoderless motion monitoring.</td>
</tr>
<tr>
<td>13</td>
<td>At least one Motor Module in parallel operation does not support the safe motion monitoring function.</td>
</tr>
</tbody>
</table>

**Remedy:**
- check whether there are faults in the safety function alignment between the Control Unit and the Motor Module involved (F01655, F30655) and if required, carry out diagnostics for the faults involved.

For fault value = 1:
- use a Motor Module that supports safe motion monitoring.

Re fault value = 2, 3, 6, 8:
- check whether there is a DRIVE-CLiQ communication error between the Control Unit and the Motor Module involved and, if required, carry out a diagnostics routine for the faults identified.

Re fault value = 4, 5, 7, 9, 13:
- upgrade the Motor Module software.

**Note:**
SI: Safety Integrated

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**F01673 SI Motion: Sensor Module software/hardware incompatible**

| Message value | %1 |
| Drive object | SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN |
| Reaction | OFF2 |
| Acknowledge | IMMEDIATELY (POWER ON) |
| Cause | The existing Sensor Module software and/or hardware does not support the safe motion monitoring function with the higher-level control. |
| Note | This fault does not result in a safety stop response. Fault value (r0949, decimal interpretation): Only for internal Siemens troubleshooting. |

**Remedy:**
- upgrade the Sensor Module software.
- use a Sensor Module that supports the safe motion monitoring function.

**Note:**
SI: Safety Integrated

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**F01680 SI Motion CU: Checksum error safety monitoring functions**

| Message value | %1 |
| Drive object | SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN |
| Reaction | OFF2 |
| Acknowledge | IMMEDIATELY (POWER ON) |
| Cause | The actual checksum calculated by the drive and entered in r9728 via the safety-relevant parameters does not match the reference checksum saved in p9729 at the last machine acceptance. Safety-relevant parameters have been changed or a fault is present. |
| Note | This fault results in a STOP A that can be acknowledged. Fault value (r0949, decimal interpretation): 0: Checksum error for SI parameters for motion monitoring. 1: Checksum error for SI parameters for actual values. 2: Checksum error for SI parameters for component assignment. |

**Remedy:**
- check the safety-relevant parameters and if required, correct.
- perform a POWER ON if safety parameters requiring a POWER ON have been modified.
- carry out an acceptance test.

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**F01681 SI Motion CU: Incorrect parameter value**

| Message value | Parameter: %1 |
| Drive object | SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN |
| Reaction | OFF2 |
| Acknowledge | IMMEDIATELY (POWER ON) |
| Cause | The parameter cannot be parameterized with this value. |
| Note | This fault does not result in a safety stop response. |
Fault value (r0949, decimal interpretation):
Parameter number with the incorrect value.
9522: The gear stage was set too high.
9500: p9500 not equal to p9300
9511: p9511 not equal to p9311

Remedy:
Correct the parameter value.
For fault value = 9500:
Align parameters 9300 and 9500, backup parameters (p0971 = 1) and carry out a POWER ON.
With hysteresis/filtering enabled (p9501.16 = 1), the following applies:
- Set parameters p9546/p9346 and p9547/p9347 acc. to the following rule: p9546 >= 2 x p9547; p9346 >= 2 x p9347.
- The following rule must also be adhered to when actual value synchronization (p9501.3 = 1) is enabled: p9549 <= p9547; p9349 <= p9347.
For fault value = 9507:
- Set synchronous or induction motor according to p0300.
Re fault value = p9511:
Align parameters 9311 and 9511, backup parameters (p0971 = 1) and carry out a POWER ON.
For fault value = 9517:
- Also check p9516.0.
For fault value = 9522:
- Correct parameters.

F01682 SI Motion CU: Monitoring function not supported
Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF2
Acknowledge: IMMEDIATELY (POWER ON)
Cause: The monitoring function enabled in p9501, p9601 or p9801 is not supported in this firmware version.
Note:
This fault results in a STOP A that cannot be acknowledged.
Fault value (r0949, decimal interpretation):
1: Monitoring function SLP not supported (p9501.1).
2: Monitoring function SCA not supported (p9501.7 and p9501.8 ... 15 and p9503).
3: Monitoring function SLS override not supported (p9501.5).
4: Monitoring function external ESR activation not supported (p9501.4).
5: Monitoring function F-DI in PROFIsafe not supported (p9501.30).
6: Enable actual value synchronization not supported (p9501.3).
9: Monitoring function not supported, enable bit reserved (p9501.2, p9501.17 ... 29, p9501.31, if required p9501.6).
10: Monitoring functions only supported for a SERVO drive object.
11: Only encoderless monitoring functions integrated in the drive are supported.
12: Monitoring functions for ncSI are not supported on a CU305.
20: Motion monitoring functions integrated in the drive are only supported in conjunction with PROFIsafe (p9501, p9601.1 ... 2 and p9801.1 ... 2).
21: PROFIsafe only supported in conjunction with motion monitoring functions integrated in the drive (p9501, p9601.1 ... 2 and p9801.1 ... 2).
22: Encoderless monitoring functions in chassis format not supported.
23: CU240 does not support monitoring functions requiring an encoder.
24: Monitoring function SDI not supported (p9501.17).
25: Drive-integrated motion monitoring functions not supported (p9501, p9601.2).
26: hysteresis and filtering for SSM monitoring function without an encoder not supported (p9501.16).

Remedy:
De-select the monitoring function involved (p9501, p9503, p9506, p9601, p9801).
Note:
ESR: Extended Stop and Retract
SCA: Safe Cam / SN: Safe software cam
SDI: Safe Direction (safe motion direction)
SI: Safety Integrated
SLP: Safely-Limited Position / SE: Safe software limit switches
SLS: Safely-Limited Speed / SG: Safely reduced speed
SDI: Safe Direction (safe motion direction)
See also: p9501 (SI Motion enable safety functions (processor 1)), p9503 (SI Motion SCA (SN) enable (Control Unit)), r9771 (SI common functions (processor 1))
Faults and alarms

List of faults and alarms

F01683  SI Motion CU: SOS/SLS enable missing
Message value:  -
Drive object:  SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction:  OFF2
Acknowledge:  IMMEDIATELY (POWER ON)
Cause:  The safety-relevant basic function "SOS/SLS" is not enabled in p9501 although other safety-relevant monitoring functions are enabled.
Note:  This fault does not result in a safety stop response.
Remedy:  Enable the function "SOS/SLS" (p9501.0) and carry out a POWER ON.
Note:  SI: Safety Integrated
SLS: Safely-Limited Speed / SG: Safely reduced speed
SOS: Safe Operating Stop / SBH: Safe operating stop
See also:  p9501 (SI Motion enable safety functions (processor 1))

F01684  SI Motion: Safely limited position limit values interchanged
Message value:  %1
Drive object:  SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction:  OFF2
Acknowledge:  IMMEDIATELY (POWER ON)
Cause:  For the function "Safely-Limited Position" (SE), a lower value is in p9534 than in p9535.
Note:  This fault does not result in a safety stop response.
Fault value (r0949, decimal interpretation):
1: Limit values SLP1 interchanged.
2: Limit values SLP2 interchanged.
Remedy:  Correct the limit values in p9534 and p9535 and carry out a POWER ON.
Note:  SI: Safety Integrated
SLP: Safely-Limited Position / SE: Safe software limit switches

F01685  SI Motion CU: Safely-limited speed limit value too high
Message value:  %1
Drive object:  SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction:  OFF2
Acknowledge:  IMMEDIATELY (POWER ON)
Cause:  The limit value for the function "Safely-Limited Speed" (SLS) is greater than the speed that corresponds to an encoder limit frequency of 500 kHz.
Note:  This fault does not result in a safety stop response.
Fault value (r0949, decimal interpretation):
Maximum permissible speed.
Remedy:  Correct the limit values for SLS and carry out a POWER ON.
Note:  SI: Safety Integrated
SLS: Safely-Limited Speed / SG: Safely reduced speed
See also:  p9531 (SI Motion SLS limit values (processor 1))

F01686  SI Motion: Illegal parameterization cam position
Message value:  %1
Drive object:  SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction:  OFF2
Acknowledge:  IMMEDIATELY (POWER ON)
Cause:  At least one enabled "Safety Cam" (SCA) is parameterized in p9536 or p9537 too close to the tolerance range around the modulo position.
The following conditions must be complied with to assign cams to a cam track:
- the cam length of cam x = p9536[x] - p9537[x] must be greater or equal to the cam tolerance + the position tolerance (= p9540 + p9542). This also means that for cams on a cam track, the minus position value must be less than the plus position value.
- the distance between 2 cams x and y (minus position value[y] - plus position value[x] = p9537[y] - p9536[x]) on a cam track must be greater than or equal to the cam tolerance + position tolerance (= p9540 + p9542).

Note:
This fault does not result in a safety stop response.

Fault value (r0949, decimal interpretation):
Number of the "Safe Cam" with an illegal position.
See also: p9501 (SI Motion enable safety functions (processor 1))

Remedy:
Correct the cam position and carry out a POWER ON.

Note:
SCA: Safe Cam / SN: Safe software cam
SI: Safety Integrated
See also: p9536 (SI Motion SCA plus cam position (processor 1)), p9537 (SI Motion SCA minus cam position (processor 1))

F01687 SI Motion: Illegal parameterization modulo value SCA (SN)
Message value:

Drive object:
SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

Reaction:
OFF2

Acknowledge:
IMMEDIATELY (POWER ON)

Cause:
The parameterized modulo value for the "Safe Cam" (SCA) function is not a multiple of 360 000 mDegrees.
Note:
This fault does not result in a safety stop response.

Remedy:
Correct the modulo value for SCA and carry out a POWER ON.

Note:
SCA: Safe Cam / SN: Safe software cam
SI: Safety Integrated
See also: p9505 (SI Motion SCA (SN) modulo value (Control Unit))

F01688 SI Motion CU: Actual value synchronization not permissible
Message value:

Drive object:
SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

Reaction:
OFF2

Acknowledge:
IMMEDIATELY (POWER ON)

Cause:
- It is not permissible to enable actual value synchronization for a 1-encoder system.
- It is not permissible to simultaneously enable actual value synchronization and a monitoring function with absolute reference (SCA/SLP).
Note:
This fault results in a STOP A that cannot be acknowledged.

Remedy:
- Either select the "actual value synchronization" function or parameterize a 2-encoder system.
- Either de-select the function "actual value synchronization" or the monitoring functions with absolute reference (SCA/SLP) and carry out a POWER ON.
Note:
SCA: Safe Cam / SN: Safe software cam
SI: Safety Integrated
SLP: Safely-Limited Position / SE: Safe software limit switches
See also: p9501 (SI Motion enable safety functions (processor 1))

C01689 SI Motion: Axis re-configured
Message value: Parameter: %1

Drive object:
SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

Reaction:
OFF2

Acknowledge:
POWER ON

Cause:
The axis configuration was changed (e.g. changeover between linear axis and rotary axis).
Parameter p0108.13 is internally set to the correct value.
Faults and alarms

List of faults and alarms

Note:
This fault does not result in a safety stop response.
Fault value (r0949, decimal interpretation):
Parameter number of parameter that initiated the change.
See also: p9502 (SI Motion axis type (processor 1))

Remedy:
The following should be carried out after the changeover:
- exit the safety commissioning mode (p0010),
- save all parameters (p0977 = 1 or "copy RAM to ROM"),
- carry out a POWER ON.

Once the Control Unit has been switched on, safety message F01680 or F30680 indicates that the checksums in
r9398[0] and r9728[0] have changed in the drive. The following must, therefore, be carried out:
- activate safety commissioning mode again.
- complete safety commissioning of the drive.
- exit the safety commissioning mode (p0010),
- save all parameters (p0977 = 1 or "copy RAM to ROM"),
- carry out a POWER ON.

Note:
For the commissioning software, the units are only consistently displayed after a project upload.

F01690
SI Motion: Data save problem for the NVRAM

Message value:
%1

Drive object:
All objects

Reaction:
NONE (OFF1, OFF2, OFF3)

Acknowledge:
POWER ON

Cause:
There is not sufficient memory space in the NVRAM on the drive to save parameters r9781 and r9782 (safety log-
book).
Note:
This fault does not result in a safety stop response.
Fault value (r0949, decimal interpretation):
0: There is no physical NVRAM available in the drive.
1: There is no longer any free memory space in the NVRAM.

Remedy:
For fault value = 0:
- use a Control Unit NVRAM.
For fault value = 1:
- de-select functions that are not required and that take up memory space in the NVRAM.
- contact the Hotline.

Note:
NVRAM: Non-Volatile Random Access Memory (non-volatile read and write memory)

A01691 (F)
SI Motion: Ti and To unsuitable for DP cycle

Message value:
-

Drive object:
SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

Reaction:
NONE

Acknowledge:
NONE

Cause:
The configured times for PROFIBUS communication are not permitted and the DP cycle is used as the actual value
acquisition cycle for the safe movement monitoring functions:
Isochronous PROFIBUS: the total of Ti and To is too high for the set DP cycle. The DP cycle should be at least 1
current controller cycle greater than the sum of Ti and To.
Non-isochronous PROFIBUS: the DP cycle must be at least 4 x current controller cycle.

Remedy:
Configure Ti and To low so that they are suitable for the DP cycle or increase the DP cycle time.
Alternative when SI monitoring integrated in the drive is enabled (p9601/p9801 > 0):
Use the actual value acquisition cycle p9511/p9311 and, in turn, set independently from DP cycle. The actual value
sensing clock cycle must be at least four times the current controller clock cycle. A clock cycle ratio of at least 8:1 is
recommended.
See also: p9511 (SI Motion actual value sensing clock cycle (processor 1))

Reaction upon F:
NONE (OFF1, OFF2, OFF3)

Acknowl. upon F:
IMMEDIATELY (POWER ON)
### F01692

**SI Motion CU: Parameter value not permitted for encoderless**

<table>
<thead>
<tr>
<th>Message value:</th>
<th>Parameter: %1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive object:</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
</tr>
<tr>
<td>Reaction:</td>
<td>OFF2</td>
</tr>
<tr>
<td>Acknowledge:</td>
<td>IMMEDIATELY (POWER ON)</td>
</tr>
<tr>
<td>Cause:</td>
<td>The parameter cannot be set to this value if encoderless motion monitoring functions have been selected in p9506. Note: This fault does not result in a safety stop response. Fault value (r0949, decimal interpretation): Parameter number with the incorrect value. See also: p9501 (SI Motion enable safety functions (processor 1))</td>
</tr>
<tr>
<td>Remedy:</td>
<td>- Correct the parameter specified in the fault value. - If necessary, de-select encoderless motion monitoring functions (p9506). See also: p9501 (SI Motion enable safety functions (processor 1))</td>
</tr>
</tbody>
</table>

### A01693 (F)

**SI CU: Safety parameter settings changed, warm restart/POWER ON required**

<table>
<thead>
<tr>
<th>Message value:</th>
<th>%1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive object:</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
</tr>
<tr>
<td>Reaction:</td>
<td>NONE</td>
</tr>
<tr>
<td>Acknowledge:</td>
<td>NONE</td>
</tr>
<tr>
<td>Cause:</td>
<td>Safety parameters have been changed; these will only take effect following a warm restart or POWER ON. Alarm value (r2124, interpret decimal): Parameter number of the safety parameter which has changed, necessitating a warm restart or POWER ON.</td>
</tr>
<tr>
<td>Remedy:</td>
<td>- carry out a warm restart (p0009 = 30, p0976 = 2, 3). - carry out a POWER ON (power off/on) for all components. Note: Before performing an acceptance test, a POWER ON must be carried out for all components.</td>
</tr>
<tr>
<td>Reaction upon F:</td>
<td>NONE (OFF1, OFF2, OFF3)</td>
</tr>
<tr>
<td>Acknowl. upon F:</td>
<td>POWER ON</td>
</tr>
</tbody>
</table>

### A01695 (F)

**SI Motion: Sensor Module was replaced**

<table>
<thead>
<tr>
<th>Message value:</th>
<th>%1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive object:</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
</tr>
<tr>
<td>Reaction:</td>
<td>NONE</td>
</tr>
<tr>
<td>Acknowledge:</td>
<td>NONE</td>
</tr>
<tr>
<td>Cause:</td>
<td>A Sensor Module, which is used for safe motion monitoring functions, was replaced. The hardware replacement must be acknowledged. An acceptance test must be subsequently performed. Note: This message does not result in a safety stop response.</td>
</tr>
<tr>
<td>Remedy:</td>
<td>Carry out the following steps using the STARTER commissioning software: - press the &quot;Acknowledge hardware replacement&quot; button in the safety screen form. - execute the function &quot;Copy RAM to ROM&quot;. - carry out a POWER ON (power off/on) for all components. As an alternative, carry out the following steps in the expert list of the commissioning software: - start the copy function for the node identifier on the drive (p9700 = 1D hex). - acknowledge the hardware CRC on the drive (p9701 = EC hex). - save all parameters (p0977 = 1). - carry out a POWER ON (power off/on) for all components. Then carry out an acceptance test (refer to the Safety Integrated Function Manual). See also: p9700 (SI Motion copy function), p9701 (Acknowledge SI motion data change)</td>
</tr>
<tr>
<td>Reaction upon F:</td>
<td>NONE (OFF1, OFF2, OFF3)</td>
</tr>
<tr>
<td>Acknowl. upon F:</td>
<td>IMMEDIATELY (POWER ON)</td>
</tr>
</tbody>
</table>
A01696 (F)  SI Motion: Testing of the motion monitoring functions selected when booting
Message value:  -
Drive object:  SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction:  NONE
Acknowledge:  NONE
Cause:  The test of the motion monitoring functions was already illegally active when booting.
This is the reason that the test is only carried out again after selecting the forced checking procedure parameterized in p9705.
Note:  This message does not result in a safety stop response.
See also: p9705 (SI Motion: Test stop signal source)
Remedy:  De-select the forced checking procedure of the safety motion monitoring functions and then select again.
The signal source for initiation is parameterized in binector input p9705.
Notice:  It is not permissible to use TM54F inputs to start the test stop.
Note:  SI: Safety Integrated
See also: p9705 (SI Motion: Test stop signal source)
Reaction upon F:  NONE (OFF1, OFF2, OFF3)
Acknowl. upon F:  IMMEDIATELY (POWER ON)

A01697 (F)  SI Motion: Motion monitoring functions must be tested
Message value:  -
Drive object:  SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction:  NONE
Acknowledge:  NONE
Cause:  The time set in p9559 for the forced checking procedure of the safety motion monitoring functions has been exceeded. A new test is required.
After next selecting the forced checking procedure parameterized in p9705, the message is withdrawn and the monitoring time is reset.
Note:  This message does not result in a safety stop response.
As the shutdown paths are not automatically checked during booting, an alarm is always issued once booting is complete.
See also: p9559 (SI Motion forced checking procedure timer (processor 1)), p9705 (SI Motion: Test stop signal source)
Remedy:  Carry out the forced checking procedure of the safety motion monitoring functions.
The signal source for initiation is parameterized in binector input p9705.
Notice:  It is not permissible to use TM54F inputs to start the test stop.
Note:  SI: Safety Integrated
See also: p9705 (SI Motion: Test stop signal source)
Reaction upon F:  NONE (OFF1, OFF2, OFF3)
Acknowl. upon F:  IMMEDIATELY (POWER ON)

A01698 (F)  SI CU: Commissioning mode active
Message value:  -
Drive object:  SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction:  NONE
Acknowledge:  NONE
Cause:  The commissioning of the "Safety Integrated" function is selected.
This message is withdrawn after the safety functions have been commissioned.
Note:  This message does not result in a safety stop response.
See also: p0010 (Drive commissioning parameter filter)
A01699 (F)  SI CU: Shutdown path must be tested

Message value: -

Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

Reaction: NONE

Acknowledge: IMMEDIATELY (POWER ON)

Cause: The time set in p9659 for the forced checking procedure of the safety shutdown paths has been exceeded. The safety shutdown paths must be re-tested.
After the next time the "STO" function is de-selected, the message is withdrawn and the monitoring time is reset.

Note:
This message does not result in a safety stop response.
See also: p9659 (SI forced checking procedure timer)

Remedy:
Select STO and then de-select again.

Note:
CU: Control Unit
SI: Safety Integrated
STO: Safe Torque Off / SH: Safe standstill

C01700  SI Motion CU: STOP A initiated

Message value: -

Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

Reaction: OFF2

Acknowledge: IMMEDIATELY (POWER ON)

Cause: The drive is stopped via a STOP A (pulses are suppressed via the safety shutdown path of the Control Unit).
Possible causes:
- stop request from the 2nd monitoring channel.
- pulses not suppressed after a parameterized time (p9557) after test stop selection.
- subsequent response to the message C01706 "SI Motion CU: SAM/SBR limit exceeded".
- subsequent response to the message C01714 "SI Motion CU: Safely-Limited Speed exceeded".
- subsequent response to the message C01701 "SI Motion CU: STOP B initiated".

Remedy:
- remove the cause of the fault on the 2nd monitoring channel.
- carry out a diagnostics routine for message C01706.
- carry out a diagnostics routine for message C01714.
- carry out a diagnostics routine for message C01701.
- check the value in p9557 (where available), increase the value if necessary, and carry out a POWER ON
- check the shutdown path of the Control Unit (check DRIVE-CLiQ communication if it has been implemented)
- replace the Motor Module/Power Module
- replace Control Unit.

This message can be acknowledged without a POWER ON as follows:
- motion monitoring functions integrated in the drive: via Terminal Module 54F (TM54F) or PROFIsafe
- motion monitoring functions with SINUMERIK: via the machine control panel in acceptance test mode only

Note:
SAM: Safe Acceleration Monitor (safe acceleration monitoring)
SBR: Safe Brake Ramp (safe brake ramp monitoring)
SI: Safety Integrated
### C01701  SI Motion CU: STOP B initiated

- **Message value:** -
- **Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
- **Reaction:** NONE
- **Acknowledge:** IMMEDIATELY (POWER ON)
- **Cause:** The drive is stopped via a STOP B (braking along the OFF3 deceleration ramp). As a result of this fault, after the time parameterized in p9556 has expired, or the speed threshold parameterized in p9560 has been undershot, message C01700 "STOP A initiated" is output.

Possible causes:
- stop request from the second monitoring channel.
- subsequent response to the message C01714 "SI Motion CU: Safety-Limited Speed exceeded".
- subsequent response to the message C01711 "SI Motion CU: Defect in a monitoring channel".
- subsequent response to the message C01707 "SI Motion CU: tolerance for safe operating stop exceeded".

- **Remedy:**
  - remove the cause of the fault on the second monitoring channel.
  - carry out a diagnostics routine for message C01714.
  - carry out a diagnostics routine for message C01711.
  - carry out a diagnostics routine for message C01707.

This message can be acknowledged without a POWER ON as follows:
- motion monitoring functions integrated in the drive: via Terminal Module 54F (TM54F) or PROFIsafe
- motion monitoring functions with SINUMERIK: via the machine control panel in acceptance test mode only

### C01706  SI Motion CU: SAM/SBR limit exceeded

- **Message value:** -
- **Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
- **Reaction:** NONE
- **Acknowledge:** IMMEDIATELY (POWER ON)
- **Cause:** Motion monitoring functions with encoder (p9506 = 0) or encoderless with set acceleration monitoring (p9506 = 3):
  - SAM - safe acceleration monitoring. After initiating STOP B (SS1) or STOP C (SS2), the speed has exceeded the selected tolerance.
  - Motion monitoring functions encoderless with set brake ramp monitoring (p9506 = 1):
    - SBR - Safe brake ramp monitoring. After initiating STOP B (SS1) or SLS changeover to the lower speed stage, the speed has exceeded the selected tolerance.
  
The drive is shut down by the message C01700 "SI Motion: STOP A initiated".

- **Remedy:**
  - Check the braking behavior and, if necessary, adapt the tolerance for the "SAM" function or modify the parameter settings for the "SBR" function.

This message can be acknowledged without a POWER ON as follows:
- motion monitoring functions integrated in the drive: via Terminal Module 54F (TM54F) or PROFIsafe
- motion monitoring functions with SINUMERIK: via the machine control panel in acceptance test mode only

Note:
- SAM: Safe Acceleration Monitor (safe acceleration monitoring)
- SBR: Safe Brake Ramp (safe ramp monitoring)
- SI: Safety Integrated

See also: p9548 (SI Motion SBR actual velocity tolerance (processor 1)), p9581 (SI Motion brake ramp reference value (processor 1)), p9582 (SI Motion brake ramp delay time (processor 1)), p9583 (SI Motion brake ramp monitoring time (processor 1))

### C01707  SI Motion CU: Tolerance for safe operating stop exceeded

- **Message value:** -
- **Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
- **Reaction:** NONE
- **Acknowledge:** IMMEDIATELY (POWER ON)
- **Cause:** The actual position has distanced itself further from the target position than the standstill tolerance.

The drive is shut down by the message C01701 "SI Motion: STOP B initiated".

- **Remedy:**
  - check whether safety faults are present and if required carry out the appropriate diagnostic routines for the particular faults.
  - check whether the standstill tolerance matches the accuracy and control dynamic performance of the axis.
  - carry out a POWER ON.
This message can be acknowledged without a POWER ON as follows:
- motion monitoring functions integrated in the drive: via Terminal Module 54F (TM54F) or PROFIsafe
- motion monitoring functions with SINUMERIK: via the machine control panel in acceptance test mode only

Note:
SI: Safety Integrated
SOS: Safe Operating Stop / SBH: Safe operating stop
See also: p9530 (SI Motion standstill tolerance (processor 1))

---

**C01708**

**SI Motion CU: STOP C initiated**

Message value: -

Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

Reaction: STOP2

Acknowledge: IMMEDIATELY (POWER ON)

Cause: The drive is stopped via a STOP C (braking along the OFF3 deceleration ramp).
"Safe Operating Stop" (SOS) is activated after the parameterized timer has expired.
Possible causes:
- stop request from the higher-level control.
- subsequent response to the message C01714 "SI Motion: Safely limited speed exceeded".
- subsequent response to the message C01715 "SI Motion: Safe end stop exceeded".

Remedy:
- remove the cause of the fault at the control.
- carry out a diagnostics routine for message C01714.
This message can be acknowledged as follows:
- motion monitoring functions integrated in the drive: Via Terminal Module 54F (TM54F) or PROFIsafe
- motion monitoring functions with SINUMERIK: Via the machine control panel

Note:
SI: Safety Integrated
SOS: Safe Operating Stop / SBH: Safe operating stop

---

**C01709**

**SI Motion CU: STOP D initiated**

Message value: -

Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

Reaction: NONE

Acknowledge: IMMEDIATELY (POWER ON)

Cause: The drive is stopped via a STOP D (braking along the path).
"Safe Operating Stop" (SOS) is activated after the parameterized timer has expired.
Possible causes:
- stop request from the higher-level control.
- subsequent response to the message C01714 "SI Motion: Safely limited speed exceeded".
- subsequent response to the message C01715 "SI Motion: Safe end stop exceeded".

Remedy:
- remove the cause of the fault at the control.
- carry out a diagnostics routine for message C01714.
This message can be acknowledged as follows:
- motion monitoring functions integrated in the drive: Via Terminal Module 54F (TM54F) or PROFIsafe
- motion monitoring functions with SINUMERIK: Via the machine control panel

Note:
SI: Safety Integrated
SOS: Safe Operating Stop / SBH: Safe operating stop

---

**C01710**

**SI Motion CU: STOP E initiated**

Message value: -

Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

Reaction: NONE

Acknowledge: IMMEDIATELY (POWER ON)

Cause: The drive is stopped via a STOP E (retraction motion).
"Safe Operating Stop" (SOS) is activated after the parameterized timer has expired.
Faults and alarms

List of faults and alarms

Possible causes:
- stop request from the higher-level control.
- subsequent response to the message C01714 "SI Motion: Safely limited speed exceeded".
- subsequent response to the message C01715 "SI Motion: Safe end stop exceeded".

See also: p9554 (SI Motion transition time STOP E to SOS (processor 1))

Remedy:
- remove the cause of the fault at the control.
- carry out a diagnostics routine for message C01714.

This message can be acknowledged as follows:
- motion monitoring functions integrated in the drive: Via Terminal Module 54F (TM54F) or PROFIsafe
- motion monitoring functions with SINUMERIK: Via the machine control panel

Note:
SI: Safety Integrated
SOS: Safe Operating Stop / SBH: Safe operating stop

C01711 SI Motion CU: Defect in a monitoring channel

Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: IMMEDIATELY (POWER ON)

Cause:
When cross-checking and comparing the two monitoring channels, the drive detected a difference between the input data or results of the monitoring functions and initiated a STOP F. One of the monitoring functions no longer reliably functions - i.e. safe operation is no longer possible.

If at least one monitoring function is active, then after the parameterized timer has expired, the message C01701 "SI Motion: STOP B initiated" is output.
The message value that resulted in a STOP F is displayed in r9725. The described message values involve the crosswise data comparison between the Control Unit and Motor Module. If the drive is operated together with a SINUMERIK, the message values are described in message 27001 of SINUMERIK.
The following message values may also occur in the following cases if the cause that is explicitly mentioned does not apply:
- cycle times not set uniformly (p9500/p9300 and p9511/p9311)
- differently parameterized axis types (p9502/p9302)
- excessively fast cycle times (p9500/p9300, p9511/p9311).
- for message values 3, 44 ... 57, 232 and 1-encoder systems, differently parameterized encoder values (p9516/p9316, p9517/p9317, p9518/p9318, p9520/p9320, p9521/p9321, p9522/p9322, p9526/p9326).
- incorrect synchronization.

Message value (r9749, interpret decimal):
0 to 999: Number of the cross-checked data that resulted in this fault.
Message values that are not subsequently listed are only for internal Siemens troubleshooting.
0: Stop request from the other monitoring channel.
1: Status image of monitoring functions SOS, SLS or SLP (result list 1) (r9710[0], r9710[1]).
2: Status image of monitoring function SCA or \( n < nx \) (result list 2) (r9711[0], r9711[1])
3: The position actual value differential (r9713) between the two monitoring channels is greater than the tolerance in p9542/p9342. When actual value synchronization is enabled (p9501.3/p9301.3), the velocity differential (based on the position actual value) is greater than the tolerance in p9549/p9349.
4: Error when synchronizing the crosswise data comparison between the two channels.
5: Function enable signals (p9501/p9301)
6: Limit value for SLS1 (p9531[0]/p9331[0])
7: Limit value for SLS2 (p9531[1]/p9331[1])
8: Limit value for SLS3 (p9531[2]/p9331[2])
9: Limit value for SLS4 (p9531[3]/p9331[3])
10: Standstill tol. (p9530/p9330)
31: Position tolerance (p9542/p9342) or (p9549/p9349) when actual value synchronization is enabled (p9501.3/p9301.3)
33: Time, velocity changeover (p9551/p9351)
35: Delay time, pulse canc. (p9556/p9356)
36: Checking time, pulse canc. (p9557/p9357)
37: Trans. time, STOP C to SOS (p9552/p9352)
38: Trans. time STOP D to SOS (p9553/p9353)
40: Stop response for SLS (p9561/p9361)
42: Shutdown speed, pulse canc. (p9560/p9360)
43: Memory test, stop response (STOP A).
44 ... 57: General
Possible cause 1 (during commissioning or parameter modification)
The tolerance value for the monitoring function is not the same on the two monitoring channels.
Possible cause 2 (during active operation)
The limit values are based on the current actual value (r9713). If the safe actual values on the two monitoring channels do not match, the limit values, which have been set at a defined interval, will also be different (i.e. corresponding to fault value 3). This can be ascertained by checking the safe actual positions.

44: Position actual value (r9713) + limit value for SLS1 (p9531[0]/p9331[0]) * Safety monitoring clock cycle
45: Position actual value (r9713) - limit value for SLS1 (p9531[0]/p9331[0]) * Safety monitoring clock cycle
46: Position actual value (r9713) + limit value for SLS2 (p9531[1]/p9331[1]) * Safety monitoring clock cycle
47: Position actual value (r9713) - limit value for SLS2 (p9531[1]/p9331[1]) * Safety monitoring clock cycle
48: Position actual value (r9713) + limit value for SLS3 (p9531[2]/p9331[2]) * Safety monitoring clock cycle
49: Position actual value (r9713) - limit value for SLS3 (p9531[2]/p9331[2]) * Safety monitoring clock cycle
50: Position actual value (r9713) + limit value for SLS4 (p9531[3]/p9331[3]) * Safety monitoring clock cycle
51: Position actual value (r9713) - limit value for SLS4 (p9531[3]/p9331[3]) * Safety monitoring clock cycle
52: Standstill position + tolerance (p9530/9330)
53: Standstill position - tolerance (p9530/9330)
54: Position actual value (r9713) + limit value nx (p9546/p9346) + tolerance (p9542/p9342)
55: Position actual value (r9713) + limit value nx (p9546/p9346)
56: Position actual value (r9713) - limit value nx (p9546/p9346)
57: Position actual value (r9713) - limit value nx (p9546/p9346) - tolerance (p9542/p9342)
58: Actual stop request.
75: Velocity limit nx (p9546, p9346).
76: Stop response for SLS1 (p9563[0]/p9363[0])
77: Stop response for SLS2 (p9563[1]/p9363[1])
78: Stop response for SLS3 (p9563[2]/p9363[2])
79: Stop response for SLS4 (p9563[3]/p9363[3])
81: Velocity tolerance for SAM (p9548/p9348)
82: SGEs for SLS correction factor.
83: Acceptance test timer (p9558/p9358)
84: Trans. time STOP F (p9555/p9355)
85: Trans. time bus failure (p9580/p9380)
86: ID 1-encoder system (p9526/p9326).
87: Encoder assignment, second channel (p9526/p9326)
89: Encoder limit freq.
230: Filter time constant for n < nx.
231: Hysteresis tolerance for n < nx.
232: Smoothed velocity actual value.
233: Limit value nx / safety monitoring clock cycle + hysteresis tolerance.
234: Limit value nx / Safety monitoring clock cycle.
235: -Limit value nx / Safety monitoring clock cycle.
236: -Limit value nx / safety monitoring clock cycle - hysteresis tolerance.
237: SGA n < nx.
238: Speed limit value for SAM (p9568/p9368).
239: Acceleration for SBR (p9581/p9381 and p9583/p9383).
240: Inverse value of acceleration for SBR (p9581/p9381 and p9583/p9383).
241: Deceleration time for SBR (p9582/p9382).
242: Encoderless safety (p9506/p9306).
243: Extended alarm acknowledgment (p9507/p9307).
244: Encoderless actual value sensing filter time (p9587/p9387).
245: Encoderless actual value sensing minimum current (p9588/p9388).
246: Voltage tolerance acceleration (p9589/p9389).
247: SDI tolerance (p9564/p9364).
248: SDI positive upper limit (0x7fffffff).
249: Position actual value (r9713) - SDI tolerance.
250: Position actual value (r9713) + SDI tolerance.
251: SDI negative lower limit (0x80000001).
252: SDI stop response (p9566/p9366).
253: SDI delay time (p9565/p9365).
254: Setting the evaluation delay for actual value sensing after pulse enable (p9586/p9386).
255: Setting, behavior during pulse suppression (p9509/p9309).
256: Status image of monitoring functions SOS, SLS, SLP, test stop, SBR, SDI (result list 1 ext) (r9710).
1000: Watchdog timer has expired. Too many signal changes have occurred at safety-relevant inputs.
1001: Initialization error of watchdog timer.
1003: Pulses already suppressed for test stop selection.
Faults and alarms

List of faults and alarms

1011: Acceptance test status between the monitoring channels differ.
1012: Plausibility violation of the actual value from the encoder.
1020: Cyc. communication failure between the monitor. cycles.
1021: Cyc. communication failure between the monit. channel and Sensor Module.
1022: Sign-of-life error for DRIVE-CLiQ encoder CU
1023: Error in the effectiveness test in the DRIVE-CLiQ encoder
1032: Sign-of-life error for DRIVE-CLiQ encoder MM
1033: Error checking offset between POS1 and POS2 for DRIVE-CLiQ encoder CU
1041: Current absolute value too low (encoderless)
1042: Current/voltage plausibility error
1043: Too many acceleration phases
1044: Actual current values plausibility error.
5000 ... 5140: PROFIsafe message values. For these fault values, the failsafe control signals (failsafe values) are transferred to the safety functions.
5000, 5014, 5023, 5024, 5030 ... 5032, 5042, 5043, 5052, 5053, 5068, 5072, 5073, 5082 ... 5087, 5090, 5091, 5122 ... 5125, 5132 ... 5140: An internal software error has occurred (only for internal Siemens troubleshooting).
5012: Error when initializing the PROFIsafe driver.
5013: The result of the initialization is different for the two controllers.
5022: Error when evaluating the F parameters. The values of the transferred F parameters do not match the expected values in the PROFIsafe driver.
5025: The result of the F parameterization is different for the two controllers.
5026: CRC error for the F parameters. The transferred CRC value of the F parameters does not match the value calculated in the PST.
5065: A communications error was identified when receiving the PROFIsafe telegram.
5066: A time monitoring error (timeout) was identified when receiving the PROFIsafe telegram.
6000 ... 6166: PROFIsafe message values (PROFIBUS DP V1/V2 and PROFINET). For these fault values, the failsafe control signals (failsafe values) are transferred to the safety functions.
6000: A fatal PROFIsafe communication error has occurred.
6064 ... 6071: Error when evaluating the F parameters. The values of the transferred F parameters do not match the expected values in the PROFIsafe driver.
6064: Destination address and PROFIsafe address are different (F_Dest_Add).
6065: Destination address not valid (F_Dest_Add).
6066: Source address not valid (F_Source_Add).
6067: Watchdog time not valid (F_WD_Time).
6068: Incorrect SIL level (F_SIL).
6069: Incorrect F-CRC length (F_CRC_Length).
6070: Incorrect F parameter version (F_Par_Version).
6071: CRC error for the F parameters (CRC1). The transferred CRC value of the F parameters does not match the value calculated in the PROFIsafe driver.
6072: F parameterization is inconsistent.
6165: A communications error was identified when receiving the PROFIsafe telegram. The fault may also occur if an inconsistent or out-of-date PROFIsafe telegram has been received after switching the Control Unit off and on or after plugging in the PROFIBUS/PROFINET cable.
6166: A time monitoring error (timeout) was identified when receiving the PROFIsafe telegram.
See also: p9555 (SI Motion transition time STOP F to STOP B (processor 1)), r9725 (SI Motion, diagnostics STOP F)

Remedy:

The following generally applies:
The monitoring clock cycles in both channels and the axis types should be checked for equality and the same setting applied if necessary. If the error continues to be identified, increasing the monitoring clock cycles may resolve it.
Re message value = 0:
- no error was identified in this monitoring channel. Note the error message of the other monitoring channel (for MM: C30711).
Re message value = 3:
Commissioning phase:
Encoder evaluation for own or second channel has been set incorrectly --> Correct the encoder evaluation.
In operation:
Check the mechanical design and the encoder signals.
Re message value = 4:
The monitoring clock cycles in both channels should be checked for equality and if required, set the same. In combination with fault value 5 from the other monitoring channel (with MM: C30711), the monitoring clock cycle settings must be increased.
Re message value = 232:
- increase the hysteresis tolerance (p9547/p9347). Possibly set the filtering higher (p9545/p9345).
- if the message value is listed under cause: Check the crosswise-compared parameters to which the message value
  refers.
- copy the safety parameters.
- carry out a POWER ON (power off/on) for all components.
- upgrade the Motor Module software.
- upgrade the Control Unit software.
- correction of the encoder evaluation. The actual values differ as a result of mechanical faults (V belts, travel to a
  mechanical endstop, wear and window setting that is too narrow, encoder fault, ...).
Re message value = 1000:
- investigate the signal associated with the safety-relevant input (contact problems).
Re message value = 1001:
- carry out a POWER ON (power off/on) for all components.
- upgrade the Motor Module software.
- upgrade the Control Unit software.
Re message value = 1005:
- check the conditions for pulse enable.
Re message value = 1011:
- for diagnostics, refer to parameter (r9571).
Re message value = 1012:
- upgrade the Sensor Module software.
- for 1-encoder systems, check the encoder parameters for equality (p9515/p9315, p9519/p9319, p9523/p9323,
  p9524/p9324, p9525/p9325, p9529/p9329).
- For DQI encoders the following applies: If required, upgrade the firmware version of the Control Unit to a more
  recent version, which is released for DQI encoders.
Re message value = 1020, 1021:
- check the communication link.
- increase the monitoring cycle clock settings (p9500, p9511).
- carry out a POWER ON (power off/on) for all components.
- replace the hardware.
Re message value = 1033:
- if required, upgrade the firmware version of the Control Unit to a more recent version, which is released for DQI
  encoders.
Re message value = 1041:
- increase the ramp-function generator ramp-up/down time (p1120/p1121).
- check that the current/speed control is set correctly (torque-generating/field-generating current and actual speed
  value may not fluctuate).
- reduce the dynamic response of the setpoint value.
- increase the minimum current (p9588).
Re message value = 1042:
- increase the ramp-function generator ramp-up/down time (p1120/p1121).
- check that the current/speed control is set correctly (torque-generating/field-generating current and actual speed
  value may not fluctuate).
- reduce the dynamic response of the setpoint value.
- increase the minimum current (p9588).
Re message value = 1043:
- increase the voltage tolerance (p9589).
- increase the ramp-function generator ramp-up/down time (p1120/p1121).
- check that the current/speed control is set correctly (torque-generating/field-generating current and actual speed
  value may not fluctuate).
- reduce the dynamic response of the setpoint value.
Re message value = 5000, 5014, 5023, 5024, 5030, 5031, 5032, 5042, 5043, 5052, 5053, 5068, 5072, 5073, 5082
  ... 5087, 5090, 5091, 5122 ... 5125, 5132 ... 5135, 5140:
- carry out a POWER ON (power off/on) for all components.
- check whether there is a DRIVE-CLiQ communication error between the Control Unit and the Motor Module
  involved and, if required, carry out a diagnostics routine for the faults identified.
- upgrade firmware to later version.
- contact the Hotline.
- replace the Control Unit.
Re message value = 5012:
- check the setting of the PROFIsafe address of the Control Unit (p9610) and that of the Motor Module (p9810). It is
  not permissible for the PROFIsafe address to be 0 or FFFF!
Re message value = 5013, 5025:
Faults and alarms

List of faults and alarms

- carry out a POWER ON (power off/on) for all components.
- check the setting of the PROFIsafe address of the Control Unit (p9610) and that of the Motor Module (p9810).
- check whether there is a DRIVE-CLiQ communication error between the Control Unit and the Motor Module involved and, if required, carry out a diagnostics routine for the faults identified.

Re message value = 5022:
- check the setting of the values of the F parameters at the PROFIsafe slave (F_SIL, F_CRC_Length, F_Par_Version, F_Source_Add, F_Dest_add, F_WD_Time).

Re message value = 5026:
- check the settings of the values of the F parameters and the F parameter CRC (CRC1) calculated from these at the PROFIsafe slave and update.

Re message value = 5065:
- check the configuration and communication at the PROFIsafe slave (cons. No. / CRC).
- check the setting of the value for F parameter F_WD_Time on the PROFIsafe slave and increase if necessary.
- check whether there is a DRIVE-CLiQ communication error between the Control Unit and the Motor Module involved and, if required, carry out a diagnostics routine for the faults identified.

Re message value = 5066:
- check the setting of the value for F parameter F_WD_Time on the PROFIsafe slave and increase if necessary.
- evaluate diagnostic information in the F host.
- check PROFIsafe connection.

Re message value = 6000:
- carry out a POWER ON (power off/on) for all components.
- check whether there is a DRIVE-CLiQ communication error between the Control Unit and the Motor Module involved and, if required, carry out a diagnostics routine for the faults identified.
- increase the monitoring cycle clock settings (p9500, p9511).
- upgrade firmware to later version.
- contact the Hotline.
- replace the Control Unit.

Re message value = 6064:
- check the setting of the value in the F parameter F_Dest_Add at the PROFIsafe slave.
- check the setting of the PROFIsafe address of the Control Unit (p9610) and that of the Motor Module (p9810).

Re message value = 6065:
- check the setting of the value in the F parameter F_Dest_Add at the PROFIsafe slave. It is not permissible for the destination address to be either 0 or FFFF!

Re message value = 6066:
- check the setting of the value in the F parameter F_Source_Add at the PROFIsafe slave. It is not permissible for the source address to be either 0 or FFFF!

Re message value = 6067:
- check the setting of the value in the F parameter F_WD_Time at the PROFIsafe slave. It is not permissible for the watch time to be 0!

Re message value = 6068:
- check the setting of the value in the F parameter F_SIL at the PROFIsafe slave. The SIL level must correspond to SIL2!

Re message value = 6069:
- check the setting of the value in the F parameter F_CRC_Length at the PROFIsafe slave. The setting of the CRC2 length is 2-byte CRC in the V1 mode and 3-byte CRC in the V2 mode!

Re message value = 6070:
- check the setting of the value in the F parameter F_Type at the PROFIsafe slave. The value for the F parameter version is 0 in the V1 mode and 1 in the V2 mode!

Re message value = 6071:
- check the settings of the values of the F parameters and the F parameter CRC (CRC1) calculated from these at the PROFIsafe slave and, if required, update.

Re message value = 6072:
- check the settings of the values for the F parameters and, if required, correct.
The following combinations are permissible for F parameters F_CRC_Length and F_Par_Version:
F_CRC_Length = 2-byte CRC and F_Par_Version = 0
F_CRC_Length = 3-byte CRC and F_Par_Version = 1

Re message value = 6165:
- if the fault occurs after powering up the Control Unit or after plugging in the PROFIBUS/PROFINET cable, acknowledge the fault.
- check the configuration and communication at the PROFI slave.
- check the setting of the value for F parameter F_WD_Time on the PROFI slave and increase if necessary.
- check whether there is a DRIVE-CLiQ communication error between the Control Unit and the Motor Module involved and, if required, carry out a diagnostics routine for the faults identified.

Re message value = 6166:
- check the configuration and communication at the PROFIsafe slave.
- check the setting of the value for F parameter F_WD_Time on the PROFIsafe slave and increase if necessary.
- evaluate diagnostic information in the F host.
- check PROFIsafe connection.
This message can be acknowledged as follows:
- motion monitoring functions integrated in the drive: Via Terminal Module 54F (TM54F) or PROFIsafe
- motion monitoring functions with SINUMERIK: Via the machine control panel
See also: p9300 (SI Motion monitoring clock cycle (processor 2)), p9500 (SI Motion monitoring clock cycle (processor 1))

C01712 SI Motion CU: Defect in F-IO processing

Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: IMMEDIATELY (POWER ON)
Cause:
When cross checking and comparing the two monitoring channels, the drive detected a difference between parameters or results of the F-IO processing and initiated a STOP F. One of the monitoring functions no longer reliably functions - i.e. safe operation is no longer possible.
The safety message C01711 with message value 0 is also displayed due to initiation of STOP F.
If at least one monitoring function is active, the safety message C01701 "SI Motion: STOP B initiated" is output after the parameterized timer has expired.
Message value (%9749, interpret decimal):
Number of the cross-checked data that resulted in this message.
1: SI discrepancy monitoring time inputs (p10002, p10102).
2: SI acknowledgement internal event input terminal (p10006, p10106).
3: SI STO input terminal (p10022, p10122).
4: SI SS1 input terminal (p10023, p10123).
5: SI SS2 input terminal (p10024, p10124).
6: SI SOS input terminal (p10025, p10125).
7: SI SLS input terminal (p10026, p10126).
8: SI SLS Limit(1) input terminal (p10027, p10127).
9: SI SLS Limit(2) input terminal (p10028, p10128).
10: SI Safe State signal selection (p10039, p10139).
11 SI F-DI input mode (p10040, p10140).
12: SI F-DO 0 signal sources (p10042, p10142).
13: Different states for static inactive signal sources (p10006, p10022 ... p10028).
14: SI discrepancy monitoring time outputs (p10002, p10102).
15: SI acknowledgment internal event (p10006, p10106).
16: SI test sensor feedback signal test mode selected for test stop (p10046, p10146, p10047, p10147).
17: SI delay time for test stop at DOs (p10001).
18 ... 25: SI test sensor feedback signal (p10046, p10146, p10047, p10147). Expected state of internal readback signal, generated from the selected test stop mode.
26 ... 33: SI test sensor feedback signal (p10046, p10146, p10047, p10147). Expected state of external readback signal, generated from the selected test stop mode.
34 ... 41: SI test sensor feedback signal (p10046, p10146, p10047, p10147). Expected state of second internal readback signal, generated from the selected test stop mode.
42: Internal data for processing the second internal readback signal, generated from the selected test stop mode (p10007, p10107).
43: Internal data for processing the internal readback signal, generated from the selected test stop mode (p10047, p10147).
44: Internal data for processing the external readback signal, generated from the selected test stop mode (p10047, p10147).
45: Internal data for initialization state of test stop mode, dependent upon test stop parameters.
46: SI digital inputs debounce time (p10017, p10117)
47: Selection F-DI for PROFIsafe (p10050, p10150)
48: Selection F-DI for PROFIsafe (p10050, p10150)
49: SI SDI positive input terminal (p10030, p10130).
50: SI SDI negative input terminal (p10031, p10131).

Remedy:
- check parameterization in the parameters involved and correct if required.
- ensure equality by copying the SI data to the second channel and then carry out an acceptance test.
- check monitoring clock cycle in p9500 and p9300 for equality.
Note:
This message can be acknowledged via F-DI or PROFIsafe.
See also: p9300 (SI Motion monitoring clock cycle (processor 2)), p9500 (SI Motion monitoring clock cycle (processor 1))

**C01714**  
**SI Motion CU: Safely-Limited Speed exceeded**

<table>
<thead>
<tr>
<th>Message value:</th>
<th>%1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive object:</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
</tr>
<tr>
<td>Reaction:</td>
<td>NONE</td>
</tr>
<tr>
<td>Acknowledge:</td>
<td>IMMEDIATELY (POWER ON)</td>
</tr>
</tbody>
</table>
| Cause:         | The drive has moved faster than that specified by the velocity limit value (p9531). The drive is stopped as a result of the configured stop response (p9563).
Message value (%9749, interpret decimal):
100: SLS1 exceeded.
200: SLS2 exceeded.
300: SLS3 exceeded.
400: SLS4 exceeded.
1000: Encoder limit frequency exceeded.

**Remedy:**
- check the traversing/motion program in the control.
- check the limits for "Safely-Limited Speed (SLS) and if required, adapt (p9531).
- motion monitoring functions integrated in the drive: Via Terminal Module 54F (TM54F) or PROFIsafe
- motion monitoring functions with SINUMERIK: Via the machine control panel

**Note:**
SI: Safety Integrated
SLS: Safely-Limited Speed / SG: Safely reduced speed
See also: p9531 (SI Motion SLS limit values (processor 1)), p9563 (SI Motion SLS-specific stop response (processor 1))

**C01716**  
**SI Motion CU: Tolerance for safe motion direction exceeded**

<table>
<thead>
<tr>
<th>Message value:</th>
<th>%1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive object:</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
</tr>
<tr>
<td>Reaction:</td>
<td>NONE</td>
</tr>
<tr>
<td>Acknowledge:</td>
<td>IMMEDIATELY (POWER ON)</td>
</tr>
</tbody>
</table>
| Cause:         | The tolerance for the "safe motion direction" function was exceeded. The drive is stopped as a result of the configured stop response (p9566).
Message value (%9749, interpret decimal):
0: Tolerance for the "safe motion direction positive" function exceeded.
1: Tolerance for the "safe motion direction positive negative" function exceeded.

**Remedy:**
- check the traversing/motion program in the control.
- check the tolerance for "SDI" function and if required, adapt (p9564).
This message can be acknowledged as follows:
Via F-DI or PROFIsafe

**Note:**
SDI: Safe Direction (safe motion direction)
SI: Safety Integrated
See also: p9564 (SI Motion SDI tolerance (processor 1)), p9565 (SI Motion SDI delay time (processor 1)), p9566 (SI Motion SDI stop response (processor 1))

**C01745**  
**SI Motion CU: Checking braking torque for the brake test**

<table>
<thead>
<tr>
<th>Message value:</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive object:</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
</tr>
<tr>
<td>Reaction:</td>
<td>NONE</td>
</tr>
<tr>
<td>Acknowledge:</td>
<td>POWER ON (IMMEDIATELY)</td>
</tr>
<tr>
<td>Cause:</td>
<td>The scaling of the brake torque for the brake test can be changed using parameter p2003. An acceptance test must be carried out again for the braking test. This determines whether the braking test is still carried out with the correct braking torque.</td>
</tr>
</tbody>
</table>
Remedy: - carry out a POWER ON (power off/on) for all components.
- repeat the acceptance test for the safe brake test if the brake test is used.
See also: p2003 (Reference torque)

C01750 SI Motion CU: Hardware fault safety-relevant encoder
Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: IMMEDIATELY (POWER ON)
Cause: The encoder that is used for the safety-relevant motion monitoring functions signals a hardware fault.
Message value (r9749, interpret decimal): Encoder status word 1, encoder status word 2 that resulted in the message.
Remedy: - check the encoder connection.
- replace the encoder.
This message can be acknowledged as follows:
- motion monitoring functions integrated in the drive: Via Terminal Module 54F (TM54F) or PROFIsafe
- motion monitoring functions with SINUMERIK: Via the machine control panel.

C01751 SI Motion CU: Effectivity test error safety-relevant encoder
Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: IMMEDIATELY (POWER ON)
Cause: The DRIVE-CLiQ encoder for safe motion monitoring signals an error for the effectivity tests.
Message value (r9749, interpret decimal): Only for internal Siemens troubleshooting.
Remedy: - check the encoder connection.
- replace the encoder.
This message can be acknowledged as follows:
- motion monitoring functions integrated in the drive: Via Terminal Module 54F (TM54F) or PROFIsafe
- motion monitoring functions with SINUMERIK: Via the machine control panel.

C01770 SI Motion CU: Discrepancy error of the failsafe inputs or outputs
Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: IMMEDIATELY (POWER ON)
Cause: The fail-safe digital inputs/digital outputs (F-DI/F-DO) show a different state longer than that parameterized in p10002 / p10102.
Fault value (r0949, interpret bitwise binary):

yyyyxxxx bin
xxxx: Discrepancy error for fail-safe digital inputs (F-DI).
Bit 0: Discrepancy error for F-DI 0
Bit 1: Discrepancy error for F-DI 1
...
yyyy: Discrepancy error for fail-safe digital outputs (F-DO).
Bit 0: Discrepancy error for F-DO 0
...
Note: If several discrepancy errors occur consecutively, then this fault is only signaled for the first error that occurs.
Remedy: - check the wiring of the F-DI (contact problems).
Note: This message can be acknowledged via F-DI or PROFIsafe.
Discrepancy errors of an F-DI can only be completely acknowledged if safe acknowledgement was carried out once the cause of the error was resolved (p10006 or acknowledgment via PROFIsafe). As long as safety acknowledgement was not carried out, the corresponding F-DI stays in the safe state internally.
For cyclic switching operations at the F-DI, it may be necessary to adapt the discrepancy time to the switching frequency.
If the period of a cyclic switching pulse has the order of magnitude of double the value of \( p10002 \), then the following formulas must be checked.

\[
p10002 < \left( \frac{tp}{2} \right) - td \quad \text{(discrepancy time must be less than half the period minus the actual discrepancy time)}
\]

\[
p10002 \geq p9500 \quad \text{(discrepancy time must be no less than P9500)}
\]

\[
p10002 > td \quad \text{(discrepancy time must be greater than the switch discrepancy time which may actually apply)}
\]

\( td = \) possible actual discrepancy time (in ms) that can occur with a switching operation. This must correspond to at least 1 SI sampling cycle (see p9500).

\( tp = \) period for a switching operation in ms.

When debounce \( p10017 \) is active, the discrepancy time is directly specified by the debounce time.

If the period of a cyclic switching pulse has the order of magnitude of twice the debounce time, then the following formulas should be checked.

\[
p10002 < p10017 + 1 \text{ ms} - td
\]

\[
p10002 > td
\]

\[
p10002 \geq p9500
\]

Example:

For a 12 ms SI sampling cycle and a switching frequency of 110 ms (\( p10017 = 0 \)), the maximum discrepancy time which can be set is as follows:

\[
p10002 < (110/2 \text{ ms}) - 12 \text{ ms} = 43 \text{ ms}
\]

Rounded-off, \( p10002 \) <= 36 ms is obtained (since the discrepancy time can only be accepted as a whole SI sampling cycle, the value will need to be rounded up or down to a whole SI sampling time value if the result is not an exact multiple of an SI sampling cycle).

Note:

F-DI: Failsafe Digital Input
F-DO: Failsafe Digital Output

---

**A01772 SI Motion CU: Test stop failsafe inputs/outputs active**

**Message value:** -

**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:**

The test stop for the fail-safe digital inputs (F-DI) and/or fail-safe digital outputs (F-DO) is presently being performed.

Note:

F-DI: Failsafe Digital Input
F-DO: Failsafe Digital Output

**Remedy:**

The alarm disappears automatically after successfully ending or canceling (when a fault condition occurs) the test stop.

---

**F01773 SI Motion CU: Test stop error**

**Message value:** %1

**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

**Reaction:** NONE

**Acknowledge:** IMMEDIATELY (POWER ON)

**Cause:**

A fault has occurred on the CU side during the test stop for the fail-safe outputs.

Fault value (r0949, interpret hexadecimal):

RRRVWWXYZ hex:

R: Reserved.

V: Actual state of the DO channel concerned (see X) on the CU (corresponds to the states read back from the hardware, bit 0 = DO 0, bit 1 = DO 1, etc.).

W: Required state of the DO channel concerned (see X, bit 0 = DO 0, bit 1 = DO 1, etc.).

X: DO channels involved, which indicate an error (bit 0 = DO 0, bit 1 = DO 1, etc.).

Y: Reason for the test stop fault.

Z: State of the test stop in which the fault has occurred.

Y: Reason for the test stop fault

Y = 1: MM side in incorrect test stop state (internal fault).

Y = 2: Expected states of the DOs were not fulfilled (CU305: readback via DI 22 / CU240 readback DI 2).

Y = 3: Incorrect timer state on CU side (internal fault)

Y = 4: Expected states of the diag DOs were not fulfilled (CU305: internal readback on MM channel).

Y = 5: Expected states of the second diag DOs were not fulfilled (CU305: internal readback on CU channel).

X and V indicate the DI or Diag-DO state dependent upon the reason for the fault (2, 4 or 5).

In the event of multiple test stop faults, the first one that occurred is shown.

Z: Test stop state and associated test actions
Z = 0 ... 3: Synchronization phase of test stop between CU and Motor Module no switching operations
Z = 4: DO + OFF and DO - OFF
Z = 5: Check to see if states are as expected
Z = 6: DO + ON and DO - ON
Z = 7: Check to see if states are as expected
Z = 8: DO + OFF and DO - ON
Z = 9: Check to see if states are as expected
Z = 10: DO + ON and DO - OFF
Z = 11: Check to see if states are as expected
Z = 12: DO + OFF and DO - OFF
Z = 13: Check to see if states are as expected
Z = 14: End of test stop

Diag expected states in table format:
Test stop state: Expectation Mode 1 / Mode 2 / Mode 3 / Mode 4
5: 0/-/-/1
7: 0/-/-/0
9: 0/-/-/0
11: 1/-/-/1
13: 0/-/-/1

Second diag expected states in table format:
Test stop state: Expectation Mode 1 / Mode 2 / Mode 3 / Mode 4
5: -/-/-/1
7: -/-/-/0
9: -/-/-/1
11: -/-/-/0
13: -/-/-/1

DI expected states in table format:
Test stop state: Expectation Mode 1 / Mode 2 / Mode 3 / Mode 4
5: -/1/1/-
7: -/0/0/-
9: -/0/1/-
11: -/0/1/-
13: -/1/1/-

Example:
Fault F01773 (CU) is signalled with fault value = 0001_0127 and fault F30773 (MM) is signalled with fault value 0000_0127.
This means that in state 7 (Z = 7) the state of the external readback signal was not set correctly (Y = 2) after DO-0 (X = 1) was switched to ON/ON.
Fault value 0001_0127 indicates that 0 was expected (W = 0) and 1 (V = 1) was read back from the hardware.
Fault value 0000_0127 on the MM indicates that the states were as expected.
In the case of fault F30773, W and V are always identical; a value of 0 always means that 0 was expected at the readback input but was not present on the other channel (CU).

Remedy: Check the wiring of the F-DOs and restart the test stop.
Note:
The fault is withdrawn if the test stop is successfully completed.
In the event of multiple test stop faults, the first one that occurred is shown.
Once the test stop has been restarted the next queued test stop fault will be signalled (if there is one).

A01774 SI Motion CU: Test stop necessary

Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: - after powering up the drive, a test stop has still not been carried out.
- a new test stop is required after commissioning.
- the time to carry out the forced checking procedure (test stop) has expired (p10003).
Remedy: Initiate test stop (BI: p10007).
A01796 (F, N)  SI Motion CU: Wait for communication  
Message value:  -  
Drive object:  SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
Reaction:  NONE  
Acknowledge:  NONE  
Cause:  The drive waits for communication to be established with SINUMERIK or TM54F to execute the safety-relevant motion monitoring functions.  
Note:  In this state, the pulses are safely suppressed.  
Remedy:  If, after a longer period of time, the message is not automatically withdrawn, the following checks have to be made as appropriate:  
For communication with SINUMERIK, the following applies:  
- check any other PROFIBUS messages/signals present and remove their cause.  
- check that assignment of the axes on the higher-level control to the drives in the drive unit is correct.  
- check enable signal of the safety-relevant motion monitoring functions for the corresponding axis on the higher-level control and if required, set it.  
For communication with TM54F, the following applies:  
- check any other messages/signals present for DRIVE-CLiQ communication with the TM54F and remove their cause.  
- check the setting of p10010. All the drive objects controlled by the TM54F must be listed.  
See also: p9601 (SI enable, functions integrated in the drive (processor 1)), p9801 (SI enable, functions integrated in the drive (processor 2))  
Reaction upon F:  NONE (OFF1, OFF2, OFF3)  
Acknowl. upon F:  IMMEDIATELY  
Reaction upon N:  NONE  
Acknowl. upon N:  NONE

C01798  SI Motion CU: Test stop running  
Message value:  -  
Drive object:  SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
Reaction:  NONE  
Acknowledge:  IMMEDIATELY (POWER ON)  
Cause:  The test stop is active.  
Remedy:  Not necessary.  
The message is withdrawn when the test stop is finished.  
Note:  SI: Safety Integrated

C01799  SI Motion CU: Acceptance test mode active  
Message value:  -  
Drive object:  SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
Reaction:  NONE  
Acknowledge:  IMMEDIATELY (POWER ON)  
Cause:  The acceptance test mode is active. The POWER ON signals of the safety-relevant motion monitoring functions can be acknowledged during the acceptance test using the RESET button of the higher-level control.  
Remedy:  Not necessary.  
The message is withdrawn when exiting the acceptance test mode.  
Note:  SI: Safety Integrated

F01800  DRIVE-CLiQ: Hardware/configuration error  
Message value:  %1  
Drive object:  All objects  
Reaction:  NONE (ENCODER, IASC/DCBRAKE, OFF1, OFF2, OFF3, STOP1, STOP2)  
Acknowledge:  IMMEDIATELY (POWER ON)  
Cause:  A DRIVE-CLiQ connection fault has occurred.
Fault value (r0949, decimal interpretation):

100 ... 107: Communication via DRIVE-CLiQ socket X100 ... X107 has not been switched to cyclic operation. The cause may be an incorrect structure or a configuration that results in an impossible bus timing.

10: Loss of the DRIVE-CLiQ connection. The cause may be, for example, that the DRIVE-CLiQ cable was withdrawn from the Control Unit or as a result of a short-circuit for motors with DRIVE-CLiQ. This fault can only be acknowledged in cyclic communication.

11: Repeated faults when detecting the connection. This fault can only be acknowledged in cyclic communication.

12: A connection was detected but the node ID exchange mechanism does not function. The reason is probably that the component is defective. This fault can only be acknowledged in cyclic communication.

Remedy:

Re fault value = 100 ... 107:
- ensure that the DRIVE-CLiQ components have the same firmware versions.
- avoid longer topologies for short current controller clock cycles.

For fault value = 10:
- check the DRIVE-CLiQ cables at the Control Unit.
- remove any short-circuit for motors with DRIVE-CLiQ.
- carry out a POWER ON.

For fault value = 11:
- check the electrical cabinet design and cable routing for EMC compliance

For fault value = 12:
- replace the component involved.

A01840 SMI: Component found without motor data

Message value: Component number: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: An SMI/DQI without motor data has been found (e.g. SMI installed as replacement part).

Alarm value (r2124, interpret decimal):
Component number from target topology.

Remedy:

1. Download the SMI/DQI data (motor/encoder data) from the data backup again (p4690, p4691).
2. Carry out a POWER ON (power off/on) for this component.

Note:
DQI: DRIVE-CLiQ Sensor Integrated
SMI: SINAMICS Sensor Module Integrated
See also: p4690 (SMI spare part component number), p4691 (SMI spare part save/download data)

A01900 (F) PB/PN: Configuration telegram error

Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: A controller attempts to establish a connection using an incorrect configuring telegram.

Alarm value (r2124, interpret decimal):
1: Connection established to more drive objects than configured in the device. The drive objects for process data exchange and their sequence are defined in p0978.
2: Too many PZD data words for output or input to a drive object. The number of possible PZD items in a drive object is specified by the number of indices in r2050/p2051.
3: Uneven number of bytes for input or output.
4: Setting data for synchronization not accepted. For more information, see A01902.
223: Illegal clock synchronization for the PZD interface set in p8815[0].
253: PN Shared Device: illegal mixed configuration of PROFIsafe and PZD.
254: PN Shared Device: Illegal double assignment of a slot/subslot.
255: PN: Configured drive object and existing drive object do not match.
501: PROFIsafe parameter error (e.g. F_dest).
Faults and alarms

List of faults and alarms

Remedy: Check the bus configuration on the master and slave sides.
Re alarm value = 1:
Check the list of the drive objects with process data exchange (p0978).
With p0978[x] = 0, all of the following drive objects in the list are excluded from the process data exchange.
Re alarm value = 2:
Check the number of data words for output and input to a drive object.
Re alarm value = 255:
Check the drive objects to be configured.
Re alarm value = 501:
Check the set PROFIsafe address (p9610).

Reaction upon F: NONE (OFF1)
Acknowl. upon F: IMMEDIATELY

A01902 IF1: PB/PN clock cycle synchronous operation parameterization not permissible
Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: Parameterization for isochronous operation is not permissible.
Alarm value (r2124, interpret decimal):
0: Bus cycle time Tdp < 0.5 ms.
1: Bus cycle time Tdp > 32 ms.
2: Bus cycle time Tdp is not an integer multiple of the current controller clock cycle.
3: Instant of the actual value sensing Ti > Bus cycle time Tdp or Ti = 0.
4: Instant of the actual value sensing Ti is not an integer multiple of the current controller clock cycle.
5: Instant of the setpoint acceptance To >= Bus cycle time Tdp or To = 0.
6: Instant of the setpoint acceptance To is not an integer multiple of the current controller clock cycle.
7: Master application cycle time Tma pc is not an integer multiple of the speed controller clock cycle.
8: Bus reserve bus cycle time Tdp - data exchange time Tdx less than two current controller clock cycles.
10: Instant of the setpoint acceptance not To <= data exchange time Tdx + To_min.
11: Master application cycle time Tma pc > 14 x Tdp or Tma pc = 0.
12: PLL tolerance window Tpll w > Tpll w_max.
13: Bus cycle time Tdp is not a multiple of all basic clock cycles p0110[x].
14: For COMM BOARD with the setting To - 1 x Tbase io = Tdp - Ti, the instant of the setpoint acceptance is not To <= Data exchange time Tdx + 2 * To_min.
15: This configuration is not permitted for Tdp < 1 ms.
16: Instant of the actual value sensing Ti is less than the permitted value (COMM BOARD: Ti >= 2 x Tbase io).
17: The setting (To + Ti = Tdp + 2 x Tbase_io) is not permitted for COMM BOARD.

Remedy: - adapt the parameterizing telegram.
- adapt the current and speed controller clock cycle.
Re alarm value = 15:
- check the number of specific drive object types in the configuration.
Note:
IF1: Interface 1
PB: PROFIBUS
PN: PROFINET
Tbase io: Time basis for Ti, To (= 125us)

F01910 (N, A) Fieldbus: setpoint timeout
Message value: -
Drive object: All objects
Reaction: OFF3 (IASC/DCBRAKE, NONE, OFF1, OFF2, STOP1, STOP2)
Acknowledge: IMMEDIATELY
Cause: The reception of setpoints from the fieldbus interface (onboard, PROFIBUS/PROFINET/USS) has been interrupted.
- bus connection interrupted.
- controller switched off.
- controller set into the STOP state.
See also: p2047 (PROFIBUS additional monitoring time)
**Remedy:**

- Restore the bus connection and set the controller to RUN.
- PROFIBUS slave redundancy: For operation on a Y link, it must be ensured that "DP alarm mode = DPV1" is set in the slave parameterization. See also: p2047 (PROFIBUS additional monitoring time)

**Reaction upon N:** NONE
**Acknow. upon N:** NONE
**Reaction upon A:** NONE
**Acknow. upon A:** NONE

---

**F01911 (N, A) PB/PN clock cycle synchronous operation clock cycle failure**

**Message value:** -
**Drive object:** All objects
**Reaction:** OFF1 (OFF3)
**Acknowledge:** IMMEDIATELY

**Cause:**
The global control telegram to synchronize the clock cycles has failed - in cyclic operation - for several DP clock cycles or has violated the time grid specified in the parameterizing telegram over several consecutive DP clock cycles (refer to the bus cycle time, Tdp and Tpllw).

**Remedy:**
- check the physical bus configuration (cable, connector, terminating resistor, shielding, etc.).
- check whether communication was briefly or permanently interrupted.
- check the bus and controller for utilization level (e.g. bus cycle time Tdp was set too short).

**Note:**
PB: PROFIBUS
PN: PROFINET

**Reaction upon N:** NONE
**Acknow. upon N:** NONE
**Reaction upon A:** NONE
**Acknow. upon A:** NONE

---

**F01912 (N, A) PB/PN clock cycle synchronous operation sign-of-life failure**

**Message value:** -
**Drive object:** All objects
**Reaction:** OFF1 (OFF3)
**Acknowledge:** IMMEDIATELY

**Cause:**
The maximum permissible number of errors in the controller sign-of-life (clock synchronous operation) has been exceeded in cyclic operation.

**Remedy:**
- physically check the bus (cables, connectors, terminating resistor, shielding, etc.).
- correct the interconnection of the controller sign-of-life (p2045).
- check whether the controller correctly sends the sign-of-life (e.g. create a trace with STW2.12 ... STW2.15 and trigger signal ZSW1.3).
- check the permissible telegram failure rate (p0925).
- check the bus and controller for utilization level (e.g. bus cycle time Tdp was set too short).

**Note:**
PB: PROFIBUS
PN: PROFINET

**Reaction upon N:** NONE
**Acknow. upon N:** NONE
**Reaction upon A:** NONE
**Acknow. upon A:** NONE

---

**F01915 (N, A) PB/PN clock cycle synchronous operation sign-of-life failure drive object 1**

**Message value:** -
**Drive object:** All objects
**Reaction:** NONE
**Acknowledge:** IMMEDIATELY

**Cause:**
Group display for problems with the sign-of-life of the master (clock-cycle synchronous operation) on the drive object 1 (Control Unit).

For central measurements, synchronism with the central master is lost.
## Faults and alarms

### List of faults and alarms

<table>
<thead>
<tr>
<th>Remedy</th>
<th>Note:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PB: PROFIBUS</td>
</tr>
<tr>
<td></td>
<td>PN: PROFINET</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reaction upon N:</th>
<th>Acknowl. upon N:</th>
</tr>
</thead>
<tbody>
<tr>
<td>NONE</td>
<td>NONE</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reaction upon A:</th>
<th>Acknowl. upon A:</th>
</tr>
</thead>
<tbody>
<tr>
<td>NONE</td>
<td>NONE</td>
</tr>
</tbody>
</table>

### A01920 (F) PROFIBUS: Interruption cyclic connection

- **Message value:** -
- **Drive object:** All objects
- **Reaction:** NONE
- **Acknowledge:** NONE
- **Cause:** The cyclic connection to the PROFIBUS master is interrupted.
- **Remedy:** Establish the PROFIBUS connection and activate the PROFIBUS master in the cyclic mode.
- **Reaction upon F:** NONE (OFF1)
- **Acknowl. upon F:** IMMEDIATELY

### A01921 (F) PROFIBUS: Receive setpoints after To

- **Message value:** -
- **Drive object:** All objects
- **Reaction:** NONE
- **Acknowledge:** NONE
- **Cause:** Output data of PROFIBUS master (setpoints) received at the incorrect instant in time within the PROFIBUS clock cycle.
- **Remedy:**
  - check bus configuration.
  - check parameters for clock cycle synchronization (ensure To > Tdx).
- **Note:**
  - To: Time of setpoint acceptance
  - Tdx: Data exchange time
- **Reaction upon F:** NONE (OFF1)
- **Acknowl. upon F:** IMMEDIATELY

### A01930 PB/PN current controller clock cycle clock cycle synch. not equal

- **Message value:** %1
- **Drive object:** All objects
- **Reaction:** NONE
- **Acknowledge:** NONE
- **Cause:** The current controller clock cycle of all drives must be set the same for the clock cycle synchronous operation.
- **Remedy:**
  - Set current controller clock cycles to identical values (p0115[0]).
- **Note:**
  - PB: PROFIBUS
  - PN: PROFINET

### A01931 PB/PN speed controller clock cycle clock cycle synch. not equal

- **Message value:** %1
- **Drive object:** All objects
- **Reaction:** NONE
- **Acknowledge:** NONE
- **Cause:** The speed controller clock cycle of all drives must be set the same for the clock cycle synchronous operation.
- **Remedy:**
  - Set speed controller clock cycles to identical values (r2124, interpret decimal).
  - Number of the drive object with different speed controller clock cycle.
- **Note:**
  - PB: PROFIBUS
  - PN: PROFINET
### Remedy:
Set the speed controller clock cycles the same (p0115[1]).

### Note:
P: PROFIBUS
PN: PROFINET

#### A01932
PB/PN clock cycle synchronization missing for DSC

**Message value:** -

**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:** There is no clock synchronization or clock synchronous sign of life and DSC is selected.

Note: DSC: Dynamic Servo Control

See also: p0922, p1190, p1191

**Remedy:** Set clock synchronization across the bus configuration and transfer clock synchronous sign-of-life.

See also: r2064 (PROFIdrive diagnostics clock synchronous mode)

#### A01940
PB/PN clock cycle synchronism not reached

**Message value:** -

**Drive object:** All objects

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:** The bus is in the data exchange state and clock synchronous operation has been selected using the parameterizing telegram. It was not possible to synchronize to the clock cycle specified by the master.

- the master does not send a clock synchronous global control telegram although clock synchronous operation was selected when configuring the bus.
- the master is using another clock synchronous DP clock cycle than was transferred to the slave in the parameterizing telegram.
- at least one drive object has a pulse enable (not controlled from PROFIBUS/PROFINET either).

**Remedy:**
- check the master application and bus configuration.
- check the consistency between the clock cycle input when configuring the slave and clock cycle setting at the master.
- check that no drive object has a pulse enable. Only enable the pulses after synchronizing the PROFIBUS/PROFINET drives.

Note: P: PROFIBUS
PN: PROFINET

#### A01941
PB/PN clock cycle signal missing when establishing bus communication

**Message value:** -

**Drive object:** All objects

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:** The bus is in the data exchange state and clock synchronous operation has been selected using the parameterizing telegram. The global control telegram for synchronization is not being received.

**Remedy:** Check the master application and bus configuration.

Note: P: PROFIBUS
PN: PROFINET

#### A01943
PB/PN clock cycle signal error when establishing bus communication

**Message value:** -

**Drive object:** All objects

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:** The bus is in the data exchange state and clock synchronous operation has been selected using the parameterizing telegram. The global control telegram for synchronization is being irregularly received.

- the master is sending an irregular global control telegram.
### Faults and alarms

#### List of faults and alarms

- the master is using another clock synchronous DP clock cycle than was transferred to the slave in the parameterizing telegram.

**Remedy:**
- check the master application and bus configuration.
- check the consistency between the clock cycle input when configuring the slave and clock cycle setting at the master.

**Note:**
PB: PROFIBUS
PN: PROFINET

<table>
<thead>
<tr>
<th>A01944</th>
<th>PB/PN sign-of-life synchronism not reached</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message value:</td>
<td>-</td>
</tr>
<tr>
<td>Drive object:</td>
<td>All objects</td>
</tr>
<tr>
<td>Reaction:</td>
<td>NONE</td>
</tr>
<tr>
<td>Acknowledge:</td>
<td>NONE</td>
</tr>
<tr>
<td>Cause:</td>
<td>The bus is in the data exchange state and clock synchronous operation has been selected using the parameterizing telegram. Synchronization with the master sign-of-life (STW2.12 ... STW2.15) could not be completed because the sign-of-life is changing differently to how it was configured in the Tmapc time grid.</td>
</tr>
</tbody>
</table>
| Remedy: | - ensure that the master correctly increments the sign-of-life in the master application clock cycle Tmapc.  
- correct the interconnection of the master sign-of-life (p2045). |
| Note: | PB: PROFIBUS
PN: PROFINET |

<table>
<thead>
<tr>
<th>A01945</th>
<th>PROFIBUS: Connection to the Publisher failed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message value:</td>
<td>Fault cause: %1 bin</td>
</tr>
<tr>
<td>Drive object:</td>
<td>All objects</td>
</tr>
<tr>
<td>Reaction:</td>
<td>NONE</td>
</tr>
<tr>
<td>Acknowledge:</td>
<td>NONE</td>
</tr>
</tbody>
</table>
| Cause: | For PROFIBUS peer-to-peer data transfer, the connection to at least one Publisher has failed.  
Alarm value (r2124, binary interpretation):  
Bit 0 = 1: Publisher with address in r2077[0], connection failed.  
...  
Bit 15 = 1: Publisher with address in r2077[15], connection failed. |
| Remedy: | - check the PROFIBUS cables.  
- carry out a first commissioning of the Publisher that has the failed connection.  
See also: r2077 (PROFIBUS diagnostics peer-to-peer data transfer addresses) |

<table>
<thead>
<tr>
<th>F01946 (A)</th>
<th>PROFIBUS: Connection to the Publisher aborted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message value:</td>
<td>Fault cause: %1 bin</td>
</tr>
<tr>
<td>Drive object:</td>
<td>All objects</td>
</tr>
<tr>
<td>Reaction:</td>
<td>OFF1 (NONE, OFF2, OFF3)</td>
</tr>
<tr>
<td>Acknowledge:</td>
<td>IMMEDIATELY (POWER ON)</td>
</tr>
</tbody>
</table>
| Cause: | At this drive object, the connection to at least one Publisher for PROFIBUS peer-to-peer data transfer in cyclic operation has been aborted.  
Fault value (r0949, interpret binary):  
Bit 0 = 1: Publisher with address in r2077[0], connection aborted.  
...  
Bit 15 = 1: Publisher with address in r2077[15], connection aborted. |
| Remedy: | - check the PROFIBUS cables.  
- check the state of the Publisher that has the aborted connection.  
See also: r2077 (PROFIBUS diagnostics peer-to-peer data transfer addresses) |

**Reaction upon A:** NONE  
**Acknowl. upon A:** NONE
### F01950 (N, A) PB/PN clock cycle synchronous operation synchronization unsuccessful

**Message value:** -
**Drive object:** All objects
**Reaction:** OFF1 (NONE)
**Acknowledge:** IMMEDIATELY (POWER ON)

**Cause:** Synchronization of the internal clock cycle to the global control telegram has failed. The internal clock cycle exhibits an unexpected shift.

**Remedy:** Only for internal Siemens troubleshooting.

**Note:**
- PB: PROFIBUS
- PN: PROFINET

**Reaction upon N:** NONE
**Acknowl. upon N:** NONE
**Reaction upon A:** NONE
**Acknowl. upon A:** NONE

### A01990 (F) USS: PZD configuration error

**Message value:** %1
**Drive object:** All objects
**Reaction:** NONE
**Acknowledge:** NONE

**Cause:** The configuration of the process data (PZD) for the USS protocol is incorrect.

**Alarm value (r2124, interpret decimal):**
1: No USS
2: PZD amount (p2022) too great for the first drive object (p978[0]).
   The number of possible PZD items in a drive object is determined by the number of indices in r2050/p2051.

**Remedy:**
- Re alarm value = 2:
  Check the amount of USS PZD (p2022) and the maximum PZD amount (r2050/p2051) for the first drive object (p0978[0]).

**Reaction upon F:** NONE (OFF1)
**Acknowl. upon F:** IMMEDIATELY

### A02000 Function generator: Start not possible

**Message value:** -
**Drive object:** All objects
**Reaction:** NONE
**Acknowledge:** NONE

**Cause:** The function generator has already been started.

**Remedy:** Stop the function generator and restart again if necessary.

**Note:**
- The alarm is reset as follows:
  - remove the cause of this alarm.
  - restart the function generator.

**See also:** p4800 (Function generator control)

### A02005 Function generator: Drive does not exist

**Message value:** %1
**Drive object:** All objects
**Reaction:** NONE
**Acknowledge:** NONE

**Cause:** The drive object specified for connection does not exist.

**See also:** p4815 (Function generator drive number)
Faults and alarms

List of faults and alarms

Remedy: Use the existing drive object with the corresponding number.
Note:
The alarm is reset as follows:
- remove the cause of this alarm.
- restart the function generator.
See also: p4815 (Function generator drive number)

A02006 Function generator: No drive specified for connection
Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: No drive specified for connection in p4815.
See also: p4815 (Function generator drive number)
Remedy: At least one drive to be connected must be specified in p4815.
Note:
The alarm is reset as follows:
- remove the cause of this alarm.
- restart the function generator.
See also: p4815 (Function generator drive number)

A02007 Function generator: Drive not SERVO / VECTOR / DC_CTRL
Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The drive object specified for connection is not a SERVO / VECTOR or DC_CTRL.
See also: p4815 (Function generator drive number)
Remedy: Use a SERVO / VECTOR / DC_CTRL drive object with the corresponding number.
Note:
The alarm is reset as follows:
- remove the cause of this alarm.
- restart the function generator.

A02008 Function generator: Drive specified a multiple number of times
Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The drive object specified for connection is already specified.
Alarm value (r2124, interpret decimal):
Drive object number of the drive object that is specified a multiple number of times.
Remedy: Specify a different drive object.
Note:
The alarm is reset as follows:
- remove the cause of this alarm.
- restart the function generator.

A02009 Function generator: Illegal mode
Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The set operating mode (p1300) of the drive object is not permissible when using the function generator.
Alarm value (r2124, interpret decimal):
Number of the drive object involved.
Remedy: Change the operating mode for this drive object to p1300 = 20 (encoderless speed control) or p1300 = 21 (speed control with encoder).

Note: The alarm is reset as follows:
- remove the cause of this alarm.
- restart the function generator.

### A02010 Function generator: Speed setpoint from the drive is not zero

<table>
<thead>
<tr>
<th>Message value:</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive object:</td>
<td>All objects</td>
</tr>
<tr>
<td>Reaction:</td>
<td>NONE</td>
</tr>
<tr>
<td>Acknowledge:</td>
<td>NONE</td>
</tr>
<tr>
<td>Cause:</td>
<td>The speed setpoint of a drive selected for connection is greater than the value for the standstill detection set using p1226.</td>
</tr>
<tr>
<td>Remedy:</td>
<td>For all of the drives specified for connection, set the speed setpoints to zero.</td>
</tr>
<tr>
<td>Note:</td>
<td>The alarm is reset as follows:</td>
</tr>
<tr>
<td></td>
<td>- remove the cause of this alarm.</td>
</tr>
<tr>
<td></td>
<td>- restart the function generator.</td>
</tr>
</tbody>
</table>

### A02011 Function generator: The actual drive speed is not zero

<table>
<thead>
<tr>
<th>Message value:</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive object:</td>
<td>All objects</td>
</tr>
<tr>
<td>Reaction:</td>
<td>NONE</td>
</tr>
<tr>
<td>Acknowledge:</td>
<td>NONE</td>
</tr>
<tr>
<td>Cause:</td>
<td>The speed actual value of a drive selected for connection is greater than the value for the standstill detection set using p1226.</td>
</tr>
<tr>
<td>Remedy:</td>
<td>Set the relevant drives to zero speed before starting the function generator.</td>
</tr>
<tr>
<td>Note:</td>
<td>The alarm is reset as follows:</td>
</tr>
<tr>
<td></td>
<td>- remove the cause of this alarm.</td>
</tr>
<tr>
<td></td>
<td>- restart the function generator.</td>
</tr>
</tbody>
</table>

### A02015 Function generator: Drive enable signals missing

<table>
<thead>
<tr>
<th>Message value:</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive object:</td>
<td>All objects</td>
</tr>
<tr>
<td>Reaction:</td>
<td>NONE</td>
</tr>
<tr>
<td>Acknowledge:</td>
<td>NONE</td>
</tr>
<tr>
<td>Cause:</td>
<td>The master control and/or enable signals are missing to connect to the specified drive.</td>
</tr>
<tr>
<td>Remedy:</td>
<td>Fetch the master control to the specified drive object and set all enable signals.</td>
</tr>
<tr>
<td>Note:</td>
<td>The alarm is reset as follows:</td>
</tr>
<tr>
<td></td>
<td>- remove the cause of this alarm.</td>
</tr>
<tr>
<td></td>
<td>- restart the function generator.</td>
</tr>
</tbody>
</table>

### A02016 Function generator: Magnetizing running

<table>
<thead>
<tr>
<th>Message value:</th>
<th>%1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive object:</td>
<td>All objects</td>
</tr>
<tr>
<td>Reaction:</td>
<td>NONE</td>
</tr>
<tr>
<td>Acknowledge:</td>
<td>NONE</td>
</tr>
<tr>
<td>Cause:</td>
<td>Magnetizing has not yet been completed on a drive object specified for connection.</td>
</tr>
<tr>
<td>Alarm value (r2124, interpret decimal):</td>
<td>Number of the drive object involved.</td>
</tr>
<tr>
<td>See also:</td>
<td>p4815 (Function generator drive number)</td>
</tr>
</tbody>
</table>
**Faults and alarms**

**List of faults and alarms**

**Remedy:** Wait for magnetizing of the motor (r0056.4).

**Note:**
- The alarm is reset as follows:
- restart the function generator.
- See also: r0056 (Status word, closed-loop control)

---

**A02020 Function generator: Parameter cannot be changed**

**Message value:** -

**Drive object:** All objects

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:** This parameter setting cannot be changed when the function generator is active (p4800 = 1).
- See also: p4810, p4812, p4813, p4820, p4821, p4822, p4823, p4824, p4825, p4826, p4827, p4828, p4829

**Remedy:**
- stop the function generator before parameterizing (p4800 = 0).
- if required, start the function generator (p4800 = 1).

**Note:**
- The alarm is reset as follows:
- remove the cause of this alarm.
- restart the function generator.
- See also: p4800 (Function generator control)

---

**A02025 Function generator: Period too short**

**Message value:** -

**Drive object:** All objects

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:** The value for the period is too short.
- See also: p4821 (Function generator period)

**Remedy:**
- Check and adapt the value for the period.

**Note:**
- The alarm is reset as follows:
- remove the cause of this alarm.
- restart the function generator.
- See also: p4821 (Function generator period)

---

**A02026 Function generator: Pulse width too high**

**Message value:** -

**Drive object:** All objects

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:** The selected pulse width is too high.
- The pulse width must be less than the period duration.
- See also: p4822 (Function generator pulse width)

**Remedy:**
- Reduce pulse width.

**Note:**
- The alarm is reset as follows:
- remove the cause of this alarm.
- restart the function generator.
- See also: p4821 (Function generator period), p4822 (Function generator pulse width)

---

**A02030 Function generator: Physical address equals zero**

**Message value:** -

**Drive object:** All objects

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:** The specified physical address is zero.
- See also: p4812 (Function generator physical address)
List of faults and alarms

Faults and alarms

Remedy: Set a physical address with a value other than zero.

Note:
The alarm is reset as follows:
- remove the cause of this alarm.
- restart the function generator.
See also: p4812 (Function generator physical address)

A02040 Function generator: Illegal value for offset

Message value: -

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: The value for the offset is higher than the value for the upper limit or lower than the value for the lower limit.
See also: p4826 (Function generator offset)

Remedy: Adjust the offset value accordingly.
Note:
The alarm is reset as follows:
- remove the cause of this alarm.
- restart the function generator.
See also: p4826 (Function generator offset), p4828 (Function generator lower limit), p4829 (Function generator upper limit)

A02041 Function generator: Illegal value for bandwidth

Message value: -

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: The bandwidth referred to the time slice clock cycle of the function generator has either been set too low or too high.
Depending on the time slice clock cycle, the bandwidth is defined as follows:
Bandwidth_max = 1 / (2 x time slice clock cycle)
Bandwidth_min = Bandwidth_max / 100000
Example:
Assumption: p4830 = 125 µs
--> Bandwidth_max = 1 / (2 x 125 µs) = 4000 Hz
--> Bandwidth_min = 4000 Hz / 100000 = 0.04 Hz
Note:
p4823: Function generator bandwidth
p4830: Function generator time slice clock cycle
See also: p4823 (Function generator bandwidth), p4830 (Function generator time slice cycle)

Remedy: Check the value for the bandwidth and adapt accordingly.
Note:
The alarm is reset as follows:
- remove the cause of this alarm.
- restart the function generator.

A02047 Function generator: Time slice clock cycle invalid

Message value: -

Drive object: All objects

Reaction: NONE

Acknowledge: NONE

Cause: The time slice clock cycle selected does not match any of the existing time slices.
See also: p4830 (Function generator time slice cycle)

Remedy: Enter an existing time slice clock cycle. The existing time slices can be read out via p7901.
Note:
The alarm is reset as follows:
- remove the cause of this alarm.
- restart the function generator.
See also: r7901 (Sampling times)
### Faults and alarms

#### List of faults and alarms

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Message value</th>
<th>Drive object</th>
<th>Reaction</th>
<th>Acknowledge</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>A02050</td>
<td>Trace: Start not possible</td>
<td>-</td>
<td>All objects</td>
<td>NONE</td>
<td>NONE</td>
<td>The trace has already been started.</td>
<td>Stop the trace and, if necessary, start again.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>See also: p4700 (Trace control)</td>
<td></td>
</tr>
<tr>
<td>A02055</td>
<td>Trace: Recording time too short</td>
<td>-</td>
<td>All objects</td>
<td>NONE</td>
<td>NONE</td>
<td>The trace duration is too short.</td>
<td>Check the selected recording time and, if necessary, adjust.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>The minimum is twice the value of the trace clock cycle.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>See also: p4721 (Trace recording time)</td>
<td></td>
</tr>
<tr>
<td>A02056</td>
<td>Trace: Recording cycle too short</td>
<td>-</td>
<td>All objects</td>
<td>NONE</td>
<td>NONE</td>
<td>The selected recording cycle is shorter than the selected basic clock cycle 0 (p0110[0]).</td>
<td>Increase the value for the trace cycle.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>See also: p4720 (Trace recording cycle)</td>
<td></td>
</tr>
<tr>
<td>A02057</td>
<td>Trace: Time slice clock cycle invalid</td>
<td>-</td>
<td>All objects</td>
<td>NONE</td>
<td>NONE</td>
<td>The time slice clock cycle selected does not match any of the existing time slices.</td>
<td>Enter an existing time slice clock cycle. The existing time slices can be read out via p7901.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>See also: p4723 (Time slice cycle for trace)</td>
<td></td>
</tr>
<tr>
<td>A02058</td>
<td>Trace: Time slice clock cycle for endless trace not valid</td>
<td>-</td>
<td>All objects</td>
<td>NONE</td>
<td>NONE</td>
<td>The selected time slice clock cycle cannot be used for the endless trace</td>
<td>Enter the clock cycle of an existing time slice with a cycle time &gt;= 2 ms for up to 4 recording channels or &gt;= 4 ms from 5 recording channels per trace.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>See also: p4723 (Time slice cycle for trace)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>The existing time slices can be read out via p7901.</td>
<td></td>
</tr>
</tbody>
</table>
A02059 Trace: Time slice clock cycle for 2 x 8 recording channels not valid
Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The selected time slice clock cycle cannot be used for more than 4 recording channels.
Remedy: Enter the clock cycle of an existing time slice with a cycle time >= 4 ms or reduce the number of recording channels to 4 per trace.
See also: p4723 (Time slice cycle for trace)
See also: p7901 (Sampling times)

A02060 Trace: Signal to be traced missing
Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: - a signal to be traced was not specified.
- the specified signals are not valid.
See also: p4730 (Trace record signal 0), p4731 (Trace record signal 1), p4732 (Trace record signal 2), p4733 (Trace record signal 3)
Remedy: - specify the signal to be traced.
- check whether the relevant signal can be traced.

A02061 Trace: Invalid signal
Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: - the specified signal does not exist.
- the specified signal can no longer be traced (recorded).
See also: p4730 (Trace record signal 0), p4731 (Trace record signal 1), p4732 (Trace record signal 2), p4733 (Trace record signal 3)
Remedy: - specify the signal to be traced.
- check whether the relevant signal can be traced.

A02062 Trace: Invalid trigger signal
Message value: -
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: - a trigger signal was not specified.
- the specified signal does not exist.
- the specified signal is not a fixed-point signal.
- the specified signal cannot be used as a trigger signal for the trace.
See also: p4711 (Trace trigger signal)
Remedy: Specify a valid trigger signal.

A02063 Trace: Invalid data type
Message value: %1
Drive object: All objects
Reaction: NONE
Acknowledge: NONE
Cause: The specified data type to select a signal using a physical address is invalid.
See also: p4711 (Trace trigger signal), p4730 (Trace record signal 0), p4731 (Trace record signal 1), p4732 (Trace record signal 2), p4733 (Trace record signal 3)
### Faults and alarms

#### List of faults and alarms

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A02070</td>
<td>Trace: Parameter cannot be changed</td>
</tr>
<tr>
<td>Message</td>
<td>-</td>
</tr>
<tr>
<td>Drive object</td>
<td>All objects</td>
</tr>
<tr>
<td>Reaction</td>
<td>NONE</td>
</tr>
<tr>
<td>Acknowledge</td>
<td>NONE</td>
</tr>
<tr>
<td>Cause</td>
<td>The trace parameter settings cannot be changed when the trace is active. See also: p4700, p4710, p4711, p4712, p4713, p4714, p4715, p4716, p4720, p4721, p4722, p4730, p4731, p4732, p4733, p4780, p4781, p4782, p4783, p4789, p4795</td>
</tr>
<tr>
<td>Remedy</td>
<td>- stop the trace before parameterization.</td>
</tr>
<tr>
<td></td>
<td>- if required, start the trace.</td>
</tr>
</tbody>
</table>

| A02075     | Trace: Pretrigger time too long                                             |
| Message    | -                                                                           |
| Drive object | All objects                                                                 |
| Reaction   | NONE                                                                        |
| Acknowledge| NONE                                                                        |
| Cause      | The selected pretrigger time must be shorter than the trace time. See also: p4721 (Trace recording time), p4722 (Trace trigger delay) |
| Remedy     | Check the pretrigger time setting and change if necessary.                  |

| F02080     | Trace: Parameterization deleted due to unit changeover                      |
| Message    | -                                                                           |
| Drive object | All objects                                                                 |
| Reaction   | NONE                                                                        |
| Acknowledge| IMMEDIATELY                                                                  |
| Cause      | The trace parameterization in the drive unit was deleted due to a unit changeover or a change in the reference parameters. |
| Remedy     | Restart trace.                                                              |

| A02099     | Trace: Insufficient Control Unit memory                                     |
| Message    | -                                                                           |
| Drive object | All objects                                                                 |
| Reaction   | NONE                                                                        |
| Acknowledge| NONE                                                                        |
| Cause      | The memory space still available on the Control Unit is no longer sufficient for the trace function. |
| Remedy     | Reduce the memory required, e.g. as follows:                                |
|            | - reduce the trace time.                                                     |
|            | - increase the trace clock cycle.                                            |
|            | - reduce the number of signals to be traced.                                |
|            | See also: r4708 (Trace memory space required), r4799 (Trace memory location free) |

| A02100     | Drive: Computing dead time current controller too short                     |
| Message    | %1                                                                           |
| Drive object | SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN                                |
| Reaction   | NONE                                                                        |
| Acknowledge| NONE                                                                        |
| Cause      | The value in p0118 produces a dead time of one clock cycle because it is prior to setpoint availability. Possible causes: |
|            | - A parameter backup with a version higher than 4.3 was loaded to a version less than or equal to 4.3. |
|            | - The system properties after replacing a component no longer match the parameter assignment. |
| Alarm value| r2134, floating point.                                                      |
| Remedy     | The minimum value for p0118 where a dead time no longer occurs.              |
### Remedy:
- set p0118 to zero.
- set p0118 to a value greater than or equal to the alarm value (for p1810.11 = 1)
- set p0117 to an automatic setting (p0117 = 1).
- check the firmware versions of the components involved.

<table>
<thead>
<tr>
<th>Alarm Code</th>
<th>Description</th>
<th>Message value</th>
<th>Drive object</th>
<th>Reaction</th>
<th>Acknowledge</th>
<th>Cause</th>
<th>Remedy:</th>
<th>Note:</th>
</tr>
</thead>
<tbody>
<tr>
<td>A02150</td>
<td>OA: Application cannot be loaded</td>
<td>%1</td>
<td>All objects</td>
<td>NONE</td>
<td>NONE</td>
<td>The system was not able to load an OA application. Alarm value (r2124, interpret hexadecimal): Only for internal Siemens troubleshooting.</td>
<td>- carry out a POWER ON (power off/on) for all components. - upgrade firmware to later version. - contact the Hotline. Note: OA: Open Architecture</td>
<td></td>
</tr>
<tr>
<td>F02151 (A)</td>
<td>OA: Internal software error</td>
<td>%1</td>
<td>All objects</td>
<td>OFF2 (NONE, OFF1, OFF3)</td>
<td>IMMEDIATELY (POWER ON)</td>
<td>An internal software error has occurred within an OA application. Fault value (r0949, interpret hexadecimal): Only for internal Siemens troubleshooting.</td>
<td>- carry out a POWER ON (power off/on) for all components. - upgrade firmware to later version. - replace the Control Unit.</td>
<td>OA: Open Architecture</td>
</tr>
<tr>
<td>F02152 (A)</td>
<td>OA: Insufficient memory</td>
<td>%1</td>
<td>All objects</td>
<td>OFF1</td>
<td>IMMEDIATELY (POWER ON)</td>
<td>Too many functions have been configured on this Control Unit (e.g. too many drives, function modules, data sets, OA applications, blocks, etc). Fault value (r0949, decimal interpretation): Only for internal Siemens troubleshooting.</td>
<td>- change the configuration on this Control Unit (e.g. fewer drives, function modules, data sets, OA applications, blocks, etc). - use an additional Control Unit. Note: OA: Open Architecture</td>
<td></td>
</tr>
</tbody>
</table>
### F03000  NVRAM fault on action

<table>
<thead>
<tr>
<th>Message value:</th>
<th>%1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive object:</td>
<td>CU_S110-CAN, CU_S110-DP, CU_S110-PN</td>
</tr>
<tr>
<td>Reaction:</td>
<td>NONE</td>
</tr>
<tr>
<td>Acknowledge:</td>
<td>IMMEDIATELY</td>
</tr>
</tbody>
</table>

**Cause:** A fault occurred during execution of action p7770 = 1, 2 for the NVRAM data.

Fault value (r0949, interpret hexadecimal):

- yyxx hex: yy = fault cause, xx = application ID
- yy = 1: The action p7770 = 1 is not supported by this version if Drive Control Chart (DCC) is activated for the drive object concerned.
- yy = 2: The data length of the specified application is not the same in the NVRAM and the backup.
- yy = 3: The data checksum in p7774 is not correct.
- yy = 4: No data available to load.

**Remedy:** Perform the remedy according to the results of the troubleshooting. If necessary, start the action again.

### F03001  NVRAM checksum incorrect

<table>
<thead>
<tr>
<th>Message value:</th>
<th>%1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive object:</td>
<td>All objects</td>
</tr>
<tr>
<td>Reaction:</td>
<td>NONE</td>
</tr>
<tr>
<td>Acknowledge:</td>
<td>IMMEDIATELY</td>
</tr>
</tbody>
</table>

**Cause:** A checksum error occurred when evaluating the non-volatile data (NVRAM) on the Control Unit. The NVRAM data affected was deleted.

**Remedy:** POWER ON all components (switch the power off and then back on again).

### A03507 (F, N)  Digital output not set

<table>
<thead>
<tr>
<th>Message value:</th>
<th>%1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive object:</td>
<td>All objects</td>
</tr>
<tr>
<td>Reaction:</td>
<td>NONE</td>
</tr>
<tr>
<td>Acknowledge:</td>
<td>NONE</td>
</tr>
</tbody>
</table>

**Cause:** Despite specification by the signal source the digital output has not been set. Possible causes:

- power supply missing.
- the digital output is in current limiting (e.g. due to short-circuit).
- The digital output is being used for Safety Extended Functions.
- The control has authority to access the digital output by means of direct access (see also r0729).

**Alarm value (r2124, interpret bitwise binary):**

- Digital output involved (structured the same as r0747).

**Remedy:**

- check the 24 V power supply (e.g. X131.7 for CU305 (ground is X131.8)).
- check the output terminals for short-circuits.
- reset the signal source of the digital output for use by Safety Extended functions.
- carry out a POWER ON (power off/on).

| Reaction upon F: | NONE |
| Acknowl. upon F: | IMMEDIATELY (POWER ON) |
| Reaction upon N: | NONE |
| Acknowl. upon N: | NONE |
### A03510 (F, N) CU: Calibration data not plausible

<table>
<thead>
<tr>
<th>Message value:</th>
<th>%1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive object:</td>
<td>CU_S110-CAN, CU_S110-DP, CU_S110-PN</td>
</tr>
<tr>
<td>Reaction:</td>
<td>NONE</td>
</tr>
<tr>
<td>Acknowledge:</td>
<td>NONE</td>
</tr>
</tbody>
</table>

**Cause:** During booting, the calibration data for the analog inputs is read and checked with respect to plausibility. At least one calibration data point was determined to be invalid.

**Remedy:**
- power down/power up the power supply for the Control Unit.
- check the DRIVE-CLiQ connection.
- If it reoccurs, replace the module.
- In principle, operation could continue.

The analog channel involved possibly does not achieve the specified accuracy.

**Reaction upon F:** NONE (OFF1, OFF2)
**Acknowl. upon F:** IMMEDIATELY (POWER ON)
**Reaction upon N:** NONE
**Acknowl. upon N:** NONE

### A03510 (F, N) TM: Calibration data not plausible

<table>
<thead>
<tr>
<th>Message value:</th>
<th>%1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive object:</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
</tr>
<tr>
<td>Reaction:</td>
<td>NONE</td>
</tr>
<tr>
<td>Acknowledge:</td>
<td>NONE</td>
</tr>
</tbody>
</table>

**Cause:** During ramp-up, the Terminal Module 31 (TM31) calibration data is read in and checked for plausibility. At least one calibration data point was determined to be invalid.

**Alarm value (r2124, binary interpretation):**
- Bit 1: 10 V value, analog input 0 invalid.
- Bit 3: 10 V value, analog input 1 invalid.
- Bit 4: Offset, analog output 0 invalid.
- Bit 5: 10 V value, analog output 0 invalid.
- Bit 6: Offset, analog output 1 invalid.
- Bit 7: 10 V value, analog input 1 invalid.

**Remedy:**
- power down/power up the power supply for the Control Unit.
- check the DRIVE-CLiQ connection.
- If it reoccurs, replace the module.
- In principle, operation could continue.

The analog channel involved possibly does not achieve the specified accuracy.

**Reaction upon F:** NONE (OFF1, OFF2)
**Acknowl. upon F:** IMMEDIATELY (POWER ON)
**Reaction upon N:** NONE
**Acknowl. upon N:** NONE

### A05000 (N) Power unit: Overtemperature heat sink AC inverter

<table>
<thead>
<tr>
<th>Message value:</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive object:</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
</tr>
<tr>
<td>Reaction:</td>
<td>NONE</td>
</tr>
<tr>
<td>Acknowledge:</td>
<td>NONE</td>
</tr>
</tbody>
</table>

**Cause:** The alarm threshold for overtemperature at the inverter heat sink has been reached. The response is set using p0290.

If the temperature of the heat sink increases by an additional 5 K, then fault F30004 is initiated.

**Remedy:**
- is the ambient temperature within the defined limit values?
- have the load conditions and the load duty cycle been appropriately dimensioned?
- has the cooling failed?

**Reaction upon N:** NONE
**Acknowl. upon N:** NONE
### List of faults and alarms

#### A05001 (N) Power unit: Overtemperature depletion layer chip

<table>
<thead>
<tr>
<th>Message value:</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive object:</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
</tr>
<tr>
<td>Reaction:</td>
<td>NONE</td>
</tr>
<tr>
<td>Acknowledge:</td>
<td>NONE</td>
</tr>
<tr>
<td>Cause:</td>
<td>Alarm threshold for overtemperature of the power semiconductor in the AC converter has been reached. Note: - The response is set using p0290. - If the depletion layer temperature increases by an additional 15 K, then fault F30025 is triggered.</td>
</tr>
<tr>
<td>Remedy:</td>
<td>Check the following: - is the ambient temperature within the defined limit values? - have the load conditions and the load duty cycle been appropriately dimensioned? - has the cooling failed? - pulse frequency too high?</td>
</tr>
<tr>
<td>Note:</td>
<td>See also: r0037, p0290 (Power unit overload response)</td>
</tr>
</tbody>
</table>

Reaction upon N: NONE
Acknowl. upon N: NONE

#### A05002 (N) Power unit: Air intake overtemperature

<table>
<thead>
<tr>
<th>Message value:</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive object:</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
</tr>
<tr>
<td>Reaction:</td>
<td>NONE</td>
</tr>
<tr>
<td>Acknowledge:</td>
<td>NONE</td>
</tr>
<tr>
<td>Cause:</td>
<td>The alarm threshold for the air intake overtemperature has been reached. For air-cooled power units, the threshold is 42 °C (hysteresis 2 K). The response is set using p0290. If the air intake temperature increases by an additional 13 K, then fault F30035 is output.</td>
</tr>
<tr>
<td>Remedy:</td>
<td>Check the following: - is the ambient temperature within the defined limit values? - has the fan failed? Check the direction of rotation.</td>
</tr>
</tbody>
</table>

Reaction upon N: NONE
Acknowl. upon N: NONE

#### A05003 (N) Power unit: Internal overtemperature

<table>
<thead>
<tr>
<th>Message value:</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive object:</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
</tr>
<tr>
<td>Reaction:</td>
<td>NONE</td>
</tr>
<tr>
<td>Acknowledge:</td>
<td>NONE</td>
</tr>
<tr>
<td>Cause:</td>
<td>The alarm threshold for internal overtemperature has been reached. If the temperature inside the power unit increases by an additional 5 K, then fault F30036 is triggered.</td>
</tr>
<tr>
<td>Remedy:</td>
<td>Check the following: - is the ambient temperature within the defined limit values? - has the fan failed? Check the direction of rotation.</td>
</tr>
</tbody>
</table>

Reaction upon N: NONE
Acknowl. upon N: NONE

#### A05004 (N) Power unit: Rectifier overtemperature

<table>
<thead>
<tr>
<th>Message value:</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive object:</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
</tr>
<tr>
<td>Reaction:</td>
<td>NONE</td>
</tr>
<tr>
<td>Acknowledge:</td>
<td>NONE</td>
</tr>
<tr>
<td>Cause:</td>
<td>The alarm threshold for the overtemperature of the rectifier has been reached. The response is set using p0290. If the temperature of the rectifier increases by an additional 5 K, then fault F30037 is triggered.</td>
</tr>
</tbody>
</table>
Remedy: Check the following:
- is the ambient temperature within the defined limit values?
- have the load conditions and the load duty cycle been appropriately dimensioned?
- has the fan failed? Check the direction of rotation.
- has a phase of the line supply failed?
- is an arm of the supply (incoming) rectifier defective?

Reaction upon N: NONE
Acknowl. upon N: NONE

A05006 (N)  Power unit: Overtemperature thermal model
Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: The temperature difference between the chip and heat sink has exceeded the permissible limit value (blocksize power units only).
Depending on p0290, an appropriate overload response is initiated.
See also: r0037
Remedy: Not necessary.
The alarm disappears automatically once the limit value is undershot.
Note:
If the alarm does not disappear automatically and the temperature continues to rise, this can result in fault F30024.
See also: p0290 (Power unit overload response)

Reaction upon N: NONE
Acknowl. upon N: NONE

N05007 (A)  Power unit: Overtemperature thermal model (chassis PU)
Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: The temperature difference between the chip and heat sink has exceeded the permissible limit value (r0293) (chassis power units only).
Depending on p0290, an appropriate overload response is initiated.
See also: r0037
Remedy: Not necessary.
The alarm disappears automatically once the limit value is undershot.
See also: p0290 (Power unit overload response)

Reaction upon A: NONE
Acknowl. upon A: NONE

F06310 (A)  Supply voltage (p0210) incorrectly parameterized
Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE (OFF1, OFF2)
Acknowledge: IMMEDIATELY (POWER ON)
Cause: For AC/AC drive units, the measured DC voltage lies outside the tolerance range after pre-charging has been completed. The following applies for the tolerance range: 1.16 * p0210 < r0070 < 1.6 * p0210.
The fault can only be acknowledged when the drive is powered down.
See also: p0210 (Drive unit line supply voltage)
Remedy: - check the parameterized supply voltage and if required change (p0210).
- check the line supply voltage.
See also: p0210 (Drive unit line supply voltage)

Reaction upon A: NONE
Acknowl. upon A: NONE
Faults and alarms

List of faults and alarms

F07011  Drive: Motor overtemperature
 Message value:  %1
 Drive object:  SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
 Reaction:  OFF2 (NONE, OFF1, OFF3, STOP1, STOP2)
 Acknowledge:  IMMEDIATELY
 Cause:
KTY:  The motor temperature has exceeded the fault threshold (p0605) or the timer (p0606) after the alarm threshold was exceeded (p0604) has expired.
PTC, bimetallic NC contact:  The response threshold of 1650 ohms was exceeded (in SME p4600..p4603 or in TM120 p4610..p4613 = 10 or 30), or the timer (p0606) has expired after 1650 ohms was exceeded (in SME p4600..p4603 or in TM120 p4610..p4613 = 12 or 32).
Possible causes:
- Motor is overloaded
- Motor ambient temperature too high.
- PTC / bimetallic NC contact: Wire breakage or sensor not connected.
Fault value (r0949, decimal interpretation):
200: The I2t motor model signals an overtemperature (p0612.0 = 1, p0611 > 0).
Number of the temperature channel leading to the message (for SME/TM120 (p0601 = 10, 11)).
See also: p0604 (Motor temperature alarm threshold), p0605 (Motor temperature fault threshold), p0606 (Motor temperature timer)
Remedy:
- Reduce the motor load.
- check the ambient temperature and the motor ventilation.
- check the wiring and the connection of the PTC or bimetallic NC contact.
See also: p0604 (Motor temperature alarm threshold), p0605 (Motor temperature fault threshold), p0606 (Motor temperature timer)
A07012 (N)  Drive: I2t motor model overtemperature
 Message value:  %1
 Drive object:  SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
 Reaction:  NONE
 Acknowledge:  NONE
 Cause:  The thermal I2t motor model (for synchronous motors) identified that the temperature alarm threshold was exceeded.
See also: r0034 (Motor utilization), p0605 (Motor temperature fault threshold), p0611 (I2t motor model thermal time constant)
Remedy:
- check the motor load and if required, reduce.
- check the ambient temperature.
- check the thermal time constant p0611.
- check the overtemperature fault threshold p0605 (= alarm threshold for the I2t motor model, see p0612)
Reaction upon N:  NONE
Acknowl. upon N:  NONE
A07015  Drive: Motor temperature sensor alarm
 Message value:  %1
 Drive object:  SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
 Reaction:  NONE
 Acknowledge:  NONE
 Cause:  An error was detected when evaluating the temperature sensor set in p0600 and p0601. With the fault, the time in p0607 is started. If the fault is still present after this time has expired, then fault F07016 is output; however, at the earliest, 50 ms after alarm A07015.
Possible causes:
- wire breakage or sensor not connected (KTY: R > 1630 Ohm).
- measured resistance too low (PTC: R < 20 Ohm, KTY: R < 50 Ohm).
Alarm value (#2124, interpret decimal):
- if SME/TM120 is selected (p0601 = 10, 11),
this is the number of the temperature channel leading to the message.
Faults and alarms
List of faults and alarms

Remedy:
- make sure that the sensor is connected correctly.
- check the parameterization (p0600, p0601).

See also: r0035 (Motor temperature), p0600 (Motor temperature sensor for monitoring), p0601 (Motor temperature sensor type), p0607 (Temperature sensor fault timer)

-------

**F07016 Drive: Motor temperature sensor fault**

**Message value:** %1

**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

**Reaction:** OFF1 (NONE, OFF2, OFF3, STOP1, STOP2)

**Acknowledge:** IMMEDIATELY

**Cause:** An error was detected when evaluating the temperature sensor set in p0600 and p0601.
Possible causes:
- wire breakage or sensor not connected (KTY: R > 1630 Ohm).
- measured resistance too low (PTC: R < 20 Ohm, KTY: R < 50 Ohm).

Note:
If alarm A07015 is present, the time in p0607 is started. If the fault is still present after this time has expired, then fault F07016 is output; however, at the earliest, 50 ms after alarm A07015.

Fault value (r0949, decimal interpretation):
- if SME/TM120 is selected (p0601 = 10, 11), this is the number of the temperature channel leading to the message.

See also: p0607 (Temperature sensor fault timer)

Remedy:
- make sure that the sensor is connected correctly.
- check the parameterization (p0600, p0601).
- induction motors: De-activate temperature sensor fault (p0607 = 0).

See also: r0035 (Motor temperature), p0600 (Motor temperature sensor for monitoring), p0601 (Motor temperature sensor type), p0607 (Temperature sensor fault timer)

-------

**F07080 Drive: Incorrect control parameter**

**Message value:** Parameter: %1

**Drive object:** All objects

**Reaction:** NONE

**Acknowledge:** IMMEDIATELY (POWER ON)

**Cause:** The closed-loop control parameters have been parameterized incorrectly (e.g. p0356 = L_spread = 0).
Fault value (r0949, decimal interpretation):
- The fault value includes the parameter number involved.
The following parameter numbers only occur as fault values for vector drives:
p0310, for synchronous motors: p0341, p0344, p0350, p0357
The following parameter numbers do not occur as fault values for synchronous motors:
p0354, p0358, p0360
See also: p0310, p0311, p0341, p0344, p0350, p0354, p0356, p0358, p0360, p0400, p0404, p0408, p0640, p1082, p1300

Remedy:
Modify the parameter indicated in the fault value (r0949) (e.g. p0640 = current limit > 0).
See also: p0311, p0341, p0344, p0350, p0354, p0356, p0358, p0360, p0400, p0404, p0408, p0640, p1082

-------

**F07082 Macro: Execution not possible**

**Message value:** Fault cause: %1, supplementary information: %2, preliminary parameter number: %3

**Drive object:** All objects

**Reaction:** NONE

**Acknowledge:** IMMEDIATELY

**Cause:** The macro cannot be executed.
Fault value (r0949, interpret hexadecimal):
ccccbbaa hex:
cccc = preliminary parameter number, bb = supplementary information, aa = fault cause
Fault causes for the trigger parameter itself:
19: Called file is not valid for the trigger parameter.
20: Called file is not valid for parameter 15.
21: Called file is not valid for parameter 700.
22: Called file is not valid for parameter 1000.
23: Called file is not valid for parameter 1500.
24: Data type of a TAG is incorrect (e.g. Index, number or bit is not U16).
Fault causes for the parameters to be set:
25: Error level has an undefined value.
26: Mode has an undefined value.
27: A value was entered as string in the tag value that is not "DEFAULT".
31: Entered drive object type unknown.
32: A device was not able to be found for the determined drive object number.
34: A trigger parameter was recursively called.
35: It is not permissible to write to the parameter via macro.
36: Check, writing to a parameter unsuccessful, parameter can only be read, not available, incorrect data type, value range or assignment incorrect.
37: Source parameter for a BICO interconnection was not able to be determined.
38: An index was set for a non-indexed (or CDS-dependent) parameter.
39: No index was set for an indexed parameter.
41: A bit operation is only permissible for parameters with the parameter format DISPLAY_BIN.
42: A value not equal to 0 or 1 was set for a BitOperation.
43: Reading the parameter to be changed by the BitOperation was unsuccessful.
51: Factory setting for DEVICE may only be executed on the DEVICE.
61: The setting of a value was unsuccessful.

Remedy:
- check the parameter involved.
- check the macro file and BICO interconnection.

See also: p0015

**F07083 Macro: ACX file not found**

**Message value:** Parameter: %1
**Drive object:** All objects
**Reaction:** NONE
**Acknowledge:** IMMEDIATELY

**Cause:** The ACX file (macro) to be executed was not able to be found in the appropriate directory.
Fault value (r0949, decimal interpretation):
Parameter number with which the execution was started.
See also: p0015

**Remedy:**
- check whether the file is saved in the appropriate directory on the memory card.
Example:
If p0015 is set to 1501, then the selected ACX file must be located in the following directory:
... /PMACROS/DEVICE/P15/PM001501.ACX

**F07084 Macro: Condition for WaitUntil not fulfilled**

**Message value:** Parameter: %1
**Drive object:** All objects
**Reaction:** NONE
**Acknowledge:** IMMEDIATELY

**Cause:** The WaitUntil condition set in the macro was not fulfilled in a certain number of attempts.
Fault value (r0949, decimal interpretation):
Parameter number for which the condition was set.

**Remedy:**
Check and correct the conditions for the WaitUntil loop.

**F07085 Drive: Open-loop/closed-loop control parameters changed**

**Message value:** Parameter: %1
**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
**Reaction:** NONE
**Acknowledge:** IMMEDIATELY (POWER ON)

**Cause:** Open-loop/closed-loop control parameters have had to be changed for the following reasons:
1. As a result of other parameters, they have exceeded the dynamic limits.
2. They cannot be used due to the fact that the hardware detected not having certain features.
Fault value (r0949, decimal interpretation):
Changed parameter number.
340: The motor and control parameters were automatically calculated (p0340 = 1), because the vector control was subsequently activated as configuration (r0108.2).
See also: p0640 (Current limit), p1082 (Maximum speed), p1300 (Open-loop/closed-loop control operating mode), p1800 (Pulse frequency setpoint)

Remedy:
Not necessary.
It is not necessary to change the parameters as they have already been correctly limited.

---

**F07086**  
Units changeover: Parameter limit violation due to reference value change

Message value: Parameter: %1  
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
Reaction: NONE  
Acknowledge: IMMEDIATELY  
Cause: A reference parameter was changed in the system. This resulted in the fact that for the parameters involved, the selected value was not able to be written in the per unit representation (cause: e.g. the steady-state minimum/maximum limit or that defined in the application was violated). The values of the parameters were set to the corresponding violated minimum/maximum limit or to the factory setting.

Fault value (r0949, parameter):
Diagnostics parameter r9450 to display the parameters that were not able to be re-calculated.

Remedy: Check the adapted parameter value and if required correct.
See also: r9450 (Reference value change parameter with unsuccessful calculation)

---

**F07087**  
Drive: Encoderless operation not possible for the selected pulse frequency

Message value: Parameter: %1  
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
Reaction: NONE  
Acknowledge: IMMEDIATELY  
Cause: Encoderless operation is not possible for the selected pulse frequency (p1800).
Encoderless operation is activated under the following conditions:
- the changeover speed for encoderless operation (p1404) is less than the maximum speed (p0322).
- a control type with encoderless operation has been selected (p1300).
- encoder faults of the motor encoder result in a fault response with encoderless operation (p0491).
See also: p0491 (Motor encoder fault response ENCODER), p1300 (Open-loop/closed-loop control operating mode), p1404 (Encoderless operation changeover speed), p1800 (Pulse frequency setpoint)

Remedy: Increase the pulse frequency (p1800).
Note:
In encoderless operation, the pulse frequency must be at least as high as half the current controller clock cycle (1/p0115[0]).

---

**F07088**  
Units changeover: Parameter limit violation due to units changeover

Message value: Parameter: %1  
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
Reaction: NONE  
Acknowledge: IMMEDIATELY  
Cause: A changeover of units was initiated.
Possible causes for the violation of a parameter limit are:
- when rounding off a parameter corresponding to its decimal places, the steady-state minimum or maximum limit was violated.
- inaccuracies for the data type "FloatingPoint".
In these cases, when the minimum limit is violated then the parameter value is rounded up and when the maximum limit is violated the parameter value is rounded down.
Fault value (r0949, decimal interpretation):
Diagnostics parameter r9451 to display all parameters whose value had to be adapted.
See also: p0100 (IEC/NEMA mot stds), p0349 (System of units, motor equivalent circuit diagram data), p0505 (Selecting the system of units), p0595 (Selecting technological units)

Remedy: Check the adapted parameter values and if required correct.
See also: r9451 (Units changeover adapted parameters)
<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Message value</th>
<th>Drive object</th>
<th>Reaction</th>
<th>Acknowledge</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>A07089</td>
<td>Changing over units: Function module activation is blocked because the units have been changed over</td>
<td>-</td>
<td>All objects</td>
<td>NONE</td>
<td>NONE</td>
<td>An attempt was made to activate a function module. This is not permissible if the units have already been changed over. See also: p0100 (IEC/NEMA mot stds), p0349 (System of units, motor equivalent circuit diagram data), p0505 (Selecting the system of units)</td>
<td>Restore units that have been changed over to the factory setting.</td>
</tr>
<tr>
<td>F07090</td>
<td>Drive: Upper torque limit less than the lower torque limit</td>
<td>-</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>OFF2</td>
<td>IMMEDIATELY</td>
<td>The upper torque limit is lower than the lower torque limit.</td>
<td>P1 must be &gt;= P2 if parameter P1 is connected to p1522 and parameter P2 to p1523.</td>
</tr>
<tr>
<td>A07200</td>
<td>Drive: Master control ON command present</td>
<td>-</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>NONE</td>
<td>NONE</td>
<td>The ON/1 command is present (no 0 signal). The command is either influenced via binector input p0840 (current CDS) or control word bit 0 via the master control.</td>
<td>Switch the signal via binector input p0840 (aktueller CDS) or control word bit 0 via the master control to 0.</td>
</tr>
<tr>
<td>F07220 (N, A)</td>
<td>Drive: Master control by PLC missing</td>
<td>-</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>OFF1</td>
<td>IMMEDIATELY</td>
<td>The &quot;master control by PLC&quot; signal was missing in operation.</td>
<td>Check the interconnection of the binector input for &quot;master control by PLC&quot; (p0854). Check the &quot;master control by PLC&quot; signal and, if required, switch in. Check the data transfer via the fieldbus (master/drive). Note: If the drive should continue to operate after withdrawing &quot;master control by PLC&quot; then fault response must be parameterized to NONE or the message type should be parameterized as alarm.</td>
</tr>
</tbody>
</table>

**Reaction upon N:** NONE

**Acknowl. upon N:** NONE

**Reaction upon A:** NONE

**Acknowl. upon A:** NONE
**F07300 (A) Drive: Line contactor feedback signal missing**

*Message value:* -

*Drive object:* SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

*Reaction:* OFF2 (NONE)

*Acknowledge:* IMMEDIATELY

*Cause:* - the line contactor was not able to be closed within the time in p0861.
- the line contactor was not able to be opened within the time in p0861.
- the line contactor dropped out during operation
- the line contactor has closed although the drive converter is powered down.

*Remedy:* - check the setting of p0860.
- check the feedback circuit from the line contactor.
- increase the monitoring time in p0861.

See also: p0860 (Line cont. fdbk sig), p0861 (Line contactor monitoring time)

*Reaction upon A:* NONE

*Acknowl. upon A:* NONE

---

**F07320 Drive: Automatic restart interrupted**

*Message value:* %1

*Drive object:* SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

*Reaction:* OFF2

*Acknowledge:* IMMEDIATELY

*Cause:* - The specified number of restart attempts (p1211) has been completely used up because within the monitoring time (p1213) the faults were not able to be acknowledged. The number of restart attempts (p1211) is decremented at each new start attempt.
- there is no active ON command.
- the monitoring time for the power unit has expired (p0857).
- when exiting commissioning or at the end of the motor identification routine or the speed controller optimization, the drive unit is not automatically powered up again.

*Fault value (r0949, interpret hexadecimal):*

- Only for internal Siemens troubleshooting.

*Remedy:* - increase the number of restart attempts (p1211). The actual number of starting attempts is displayed in r1214.
- increase the delay time in p1212 and/or the monitoring time in p1213.
- issue an ON command (p0840).
- either increase or disable the monitoring time of the power unit (p0857).

---

**A07321 Drive: Automatic restart active**

*Message value:* -

*Drive object:* SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

*Reaction:* NONE

*Acknowledge:* NONE

*Cause:* The automatic restart (AR) is active. When the line supply returns and/or the causes of the existing faults are removed the drive is automatically restarted. The pulses are enabled and the motor starts to rotate.

*Remedy:* - the automatic restart (AR) should, if required, be inhibited (p1210 = 0).
- an automatic restart can be directly interrupted by withdrawing the power-on command (BI: p0840).

---

**A07350 (F) Drive: Measuring probe parameterized to a digital output**

*Message value:* %1

*Drive object:* All objects

*Reaction:* NONE

*Acknowledge:* NONE

*Cause:* The measuring probe is connected to a bi-directional digital input/output and the terminal is set as output.

*Alarm value (r2124, interpret decimal):*

- 8: DI/DO 8 (X122.9/X132.1)
- 9: DI/DO 9 (X122.10/X132.2)
- 10: DI/DO 10 (X122.12/X132.3)
- 11: DI/DO 11 (X122.13/X132.4)
- 12: DI/DO 12 (X132.9)
Faults and alarms

List of faults and alarms

13: DI/DO 13 (X132.10)
14: DI/DO 14 (X132.12)
15: DI/DO 15 (X132.13)
To the terminal designation:
The first designation is valid for CU320, the second for CU305.

Remedy:
- set the terminal as input (p0728).
- de-select the measuring probe (p0488, p0489, p0580).

Reaction upon F: OFF1
Acknowl. upon F: IMMEDIATELY

A07400 (N) Drive: DC link voltage maximum controller active
Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: The DC link voltage controller has been activated because of the upper switch-in threshold (r1244).
A system deviation can occur between the setpoint and actual speed.
See also: r0056 (Status word, closed-loop control), p1240 (Vdc controller or Vdc monitoring configuration)

Remedy: Not necessary.
This alarm automatically disappears after the upper threshold has been distinctly undershot.
Otherwise, apply the following measures:
- use a Braking Module or regenerative feedback unit.
- increase the ramp-down times (p1121, p1135).
- shut down the Vdc_max controller (p1240 = 0).

Reaction upon N: NONE
Acknowl. upon N: NONE

A07402 (N) Drive: DC link voltage minimum controller active
Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: The DC link voltage controller has been activated due to the lower switch-in threshold (r1248).
A system deviation can occur between the setpoint and actual speed.
A possible cause can be e.g. that the line supply has failed.
See also: r0056 (Status word, closed-loop control), p1240 (Vdc controller or Vdc monitoring configuration), p1248
(DC link voltage threshold lower)

Remedy: Not necessary.
This alarm automatically disappears after the lower threshold has been distinctly exceeded.
Otherwise, apply the following measures:
- check the line supply and infeed.
- increase the ramp-up times (p1120).
- shut down the Vdc_min controller (p1240 = 0).

Reaction upon N: NONE
Acknowl. upon N: NONE

F07403 (N, A) Drive: Lower DC link voltage threshold reached
Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF1 (NONE, OFF2, OFF3)
Acknowledge: IMMEDIATELY
Cause: The DC link voltage monitoring is active (p1240 = 5, 6) and the lower DC link voltage threshold (p1248) was reached in the "Operation" state.

Remedy:
- check the line supply voltage.
- check the infeed.
- reduce the lower DC link threshold (p1248).
- switch out (disable) the DC link voltage monitoring (p1240 = 0).
### F07404  Drive: Upper DC link voltage threshold reached

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reaction upon N:</td>
<td>NONE</td>
</tr>
<tr>
<td>Acknowl. upon N:</td>
<td>NONE</td>
</tr>
<tr>
<td>Reaction upon A:</td>
<td>NONE</td>
</tr>
<tr>
<td>Acknowl. upon A:</td>
<td>NONE</td>
</tr>
</tbody>
</table>

**Message value:** -  
**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
**Reaction:** OFF2 (NONE, OFF1, OFF3)  
**Acknowledge:** IMMEDIATELY  
**Cause:** The DC link voltage monitoring is active (p1240 = 4, 6) and the upper DC link voltage threshold (p1244) was reached in the "Operation" state.  
**Remedy:**  
- check the line supply voltage.  
- check the infeed module or the Braking Module.  
- increase the upper DC link voltage threshold (p1244).  
- switch out (disable) the DC link voltage monitoring (p1240 = 0).  

### F07410  Drive: Current controller output limited

**Message value:** -  
**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
**Reaction:** OFF2 (NONE, OFF1)  
**Acknowledge:** IMMEDIATELY  
**Cause:** The condition "I_act = 0 and Uq_set_1 longer than 16 ms at its limit" is present and can be caused by the following:  
- motor not connected or motor contactor open.  
- no DC link voltage present.  
- Motor Module defective.  
**Remedy:**  
- connect the motor or check the motor contactor.  
- check the DC link voltage (r0070).  
- check the Motor Module.  

### F07411  Drive: Flux controller output limited

**Message value:** -  
**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
**Reaction:** OFF2 (NONE, OFF1)  
**Acknowledge:** IMMEDIATELY  
**Cause:** The specified flux setpoint cannot be reached although 90% of the maximum current has been specified.  
- incorrect motor data.  
- motor data and motor configuration (star-delta) do not match.  
- the current limit has been set too low for the motor.  
- induction motor (encoderless, open-loop controlled) in I2t limiting.  
- the Motor Module is too small.  
**Remedy:**  
- correct the motor data.  
- check the motor configuration.  
- correct the current limits (p0640, p0323).  
- reduce the induction motor load.  
- if required, use a larger Motor Module.  

### F07412  Drive: Commutation angle incorrect (motor model)

**Message value:** -  
**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
**Reaction:** ENCODER (NONE, OFF2)  
**Acknowledge:** IMMEDIATELY  
**Cause:** An incorrect commutation angle was detected that can result in a positive coupling in the speed controller. Possible causes:  
- the motor encoder is incorrectly adjusted with respect to the magnet position.  
- the motor encoder is damaged.  
- the angular commutation offset is incorrectly set (p0431).
- data to calculate the motor model has been incorrectly set (p0356 (motor-stator leakage inductance) and/or p0350 (motor-stator resistance) and/or p0352 (cable resistance).
- the changeover speed for the motor model is too low (p1752). The monitoring function only becomes effective above the changeover speed.
- pole position identification might have calculated an incorrect value when activated (p1982 = 1).
- the motor encoder speed signal is faulted.
- the control loop is instable due to incorrect parameterization.
Fault value (r0949, decimal interpretation):
SERVO:
0: The comparison of the pole position angle from the encoder and motor model resulted in an excessively high value (> 80 ° electrical).
1: -
VECTOR:
0: The comparison of the pole position angle from the encoder and motor model resulted in an excessively high value (> 45 ° electrical).
1: The change in the speed signal from the motor encoder has changed by > p0492 within a current controller clock cycle.
Remedy:
- if the encoder mounting was changed - re-adjust the encoder.
- replace the defective motor encoder.
- correctly set the angular commutation offset (p0431). If required, determine using p1990.
- correctly set the motor stator resistance, cable resistance and motor-stator leakage inductance (p0350, p0352, p0356).
Calculate the cable resistance from the cross-section and length, check the inductance and stator resistance using the motor data sheet, measure the stator resistance, e.g. using a multimeter - and if required, again identify the values using the stationary motor data identification (p1910).
- increase the changeover speed for the motor model (p1752). The monitoring is completely de-activated for p1752 > p1082 (maximum speed).
- with pole position identification activated (p1982 = 1) check the procedure for pole position identification (p1980) and force a new pole position identification procedure by means of de-selection followed by selection (p1982 = 0 -> 1).
Note:
For High Dynamic Motors (1FK7xxx-7xxx), for applications with a higher current, if necessary, the monitoring should be disabled.

F07413 Drive: Commutation angle incorrect (pole position identification)
Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: ENCODER (NONE, OFF2)
Acknowledge: IMMEDIATELY
Cause:
An incorrect commutation angle was detected that can result in a positive coupling in the speed controller.
Within the pole position identification routine (p1982 = 2):
- a difference of > 45° electrical to the encoder angle was determined.
For VECTOR, within the encoder adjustment (p1990 = 2):
- a difference of > 6 ° electrical to the encoder angle was determined.
Remedy:
- correctly set the angular commutation offset (p0431).
- re-adjust the motor encoder after the encoder has been replaced.
- replace the defective motor encoder.
- check the pole position identification routine. If the pole position identification routine is not suitable for this motor type, then disable the plausibility check (p1982 = 0).

F07414 (N, A) Drive: Encoder serial number changed
Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: ENCODER (NONE, OFF2)
Acknowledge: IMMEDIATELY
Cause:
The serial number of the motor encoder of a synchronous motor has changed. The change was only checked for encoders with serial number (e.g. EnDat encoders) and build-in motors (e.g. p0300 = 401) or third-party motors (p0300 = 2).
Cause 1:
The encoder was replaced.
List of faults and alarms

Cause 2:
A third-party, build-in or linear motor was re-commissioned.

Cause 3:
The motor with integrated and adjusted encoder was replaced.

Cause 4:
The firmware was updated to a version that checks the encoder serial number.

Remedy:
Re causes 1, 2:
Carry out an automatic adjustment using the pole position identification routine. Acknowledge the fault. Initiate the pole position identification routine with p1990 = 1. Then check that the pole position identification routine is correctly executed.

SERVO:
If a pole position identification technique is selected in p1980, and if p0301 does not contain a motor type with an encoder adjusted in the factory, then p1990 is automatically activated.
or
Set the adjustment via p0431. In this case, the new serial number is automatically accepted.
or
Mechanically adjust the encoder. Accept the new serial number with p0440 = 1.
Re causes 3, 4:
Accept the new serial number with p0440 = 1.

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

N07415 (F)  Drive: Angular commutation offset transfer running
Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF2
Acknowledge: NONE
Cause: The angular commutation offset was automatically determined using p1990 = 1.
This fault causes the pulses to be suppressed - this is necessary to transfer the angular commutation offset to p0431.
See also: p1990 (Encoder adjustment, determine angular commutation offset)
Remedy: The fault can be acknowledged without any additional measures.
Reaction upon F: OFF2
Acknowl. upon F: IMMEDIATELY

F07420  Drive: Current setpoint filter natural frequency > Shannon frequency
Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE (OFF1, OFF2, OFF3)
Acknowledge: IMMEDIATELY (POWER ON)
Cause: One of the filter natural frequencies is greater than the Shannon frequency.
The Shannon frequency is calculated according to the following formula: 0.5 / p0115[0]
Fault value (r0949, interpret hexadecimal):
Bit 0: Filter 1 (p1658, p1660)
Bit 1: Filter 2 (p1663, p1665)
Bit 2: Filter 3 (p1668, p1670)
Bit 3: Filter 4 (p1673, p1675)
Bit 8 ... 15: Data set number (starting from zero)
Remedy:
- reduce the numerator or denominator natural frequency of the current setpoint filter involved.
- reduce the current controller sampling time (p0115[0]).
- switch out the filter involved (p1656).
### List of faults and alarms

#### F07421 Drive: Speed filter natural frequency > Shannon frequency

- **Message value:** %1
- **Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
- **Reaction:** NONE (OFF1, OFF2, OFF3)
- **Acknowledge:** IMMEDIATELY (POWER ON)
- **Cause:** One of the filter natural frequencies is greater than the Shannon frequency.
  - The Shannon frequency is calculated according to the following formula: $0.5 / p0115[1]$
  - Fault value (r0949, interpret hexadecimal):
    - Bit 0: Filter 1 (p1417, p1419)
    - Bit 1: Filter 2 (p1423, p1425)
    - Bit 8 ... 15: Data set number (starting from zero)
- **Remedy:**
  - reduce the numerator or denominator natural frequency of the speed setpoint filter involved.
  - reduce the speed controller sampling time (p0115[1]).
  - switch out the filter involved (p1414).

#### F07422 Drive: Reference model natural frequency > Shannon frequency

- **Message value:** -
- **Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
- **Reaction:** NONE (OFF1, OFF2, OFF3)
- **Acknowledge:** IMMEDIATELY (POWER ON)
- **Cause:** The natural filter frequency of the PT2 element for the reference model (p1433) is greater than the Shannon frequency.
  - The Shannon frequency is calculated according to the following formula: $0.5 / p0115[1]$
- **Remedy:**
  - reduce the natural frequency of PT2 element for reference model (p1433).
  - reduce the speed controller sampling time (p0115[1]).

#### F07426 (A) Technology controller actual value limited

- **Message value:** %1
- **Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
- **Reaction:** OFF1 (IASC/DCBRAKE, NONE, OFF2, OFF3)
- **Acknowledge:** IMMEDIATELY
- **Cause:** The actual value for the technology controller, interconnected via connector input p2264, has reached a limit.
  - Fault value (r0949, decimal interpretation):
    - 1: upper limit reached.
    - 2: lower limit reached.
- **Remedy:**
  - adapt the limits to the signal level (p2267, p2268).
  - check the scaling of the actual value (p2264).
  - See also: p2264 (Technology controller actual value), p2267 (Technology controller upper limit actual value), p2268 (Technology controller lower limit actual value)
- **Reaction upon A:** NONE
- **Acknow. upon A:** NONE

#### F07429 Drive: DSC without encoder not possible

- **Message value:** -
- **Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
- **Reaction:** OFF2
- **Acknowledge:** IMMEDIATELY (POWER ON)
- **Cause:** The function DSC (Dynamic Servo Control) was activated although there is no encoder.
  - See also: p1191 (DSC position controller gain KPC)
- **Remedy:**
  - If there is no encoder and connector input p1191 (DSC position controller gain) is interconnected, then connector input p1191 must have a 0 signal.
### List of Faults and Alarms

#### F07430  Drive: Changeover to open-loop torque controlled operation not possible

<table>
<thead>
<tr>
<th>Message value:</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive object:</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
</tr>
<tr>
<td>Reaction:</td>
<td>OFF2 (NONE, OFF1, OFF3)</td>
</tr>
<tr>
<td>Acknowledge:</td>
<td>IMMEDIATELY</td>
</tr>
<tr>
<td>Cause:</td>
<td>For encoderless operation, the converter cannot change over to closed-loop torque-controlled operation (Bi: p1501).</td>
</tr>
<tr>
<td>Remedy:</td>
<td>Do not attempt to cover over to closed-loop torque-controlled operation.</td>
</tr>
</tbody>
</table>

#### F07431  Drive: Changeover to encoderless operation not possible

<table>
<thead>
<tr>
<th>Message value:</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive object:</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
</tr>
<tr>
<td>Reaction:</td>
<td>OFF2 (OFF1)</td>
</tr>
<tr>
<td>Acknowledge:</td>
<td>IMMEDIATELY</td>
</tr>
<tr>
<td>Cause:</td>
<td>For closed-loop torque control, the converter cannot change over to encoderless operation (p1404).</td>
</tr>
<tr>
<td>Remedy:</td>
<td>Do not attempt to change over to encoderless operation.</td>
</tr>
</tbody>
</table>

#### F07432  Drive: Motor without overvoltage protection

<table>
<thead>
<tr>
<th>Message value:</th>
<th>%1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive object:</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
</tr>
<tr>
<td>Reaction:</td>
<td>OFF2 (OFF1)</td>
</tr>
<tr>
<td>Acknowledge:</td>
<td>IMMEDIATELY</td>
</tr>
<tr>
<td>Cause:</td>
<td>In the case of a fault at maximum speed, the motor can generate an overvoltage that can destroy the drive system. Fault value (r0949, interpret hexadecimal): Associated Drive Data Set (DDS).</td>
</tr>
</tbody>
</table>
| Remedy:        | Overvoltage protection can be implemented in the following ways:
- limit the maximum speed (p1082) without any additional protection. 
The maximum speed without protection is calculated as follows:
- Rotary synchronous motors: p1082 [rpm] <= 11.695 * p0297/p0316 [Nm/A] 
  Linear motors: p1082 [m/min] <= 73.484 * p0297/p0316 [Nm/A] 
  Rotary synchronous motors connected to a high-frequency converter: p1082 [rpm] <= 4.33165 * (p0316 + square root(p0316^2 + 4.86E-9 * p0297 * r0313 / (p0377 - r0233) [mH] * r0234 [µF]) / (p0297 * r0313^2 * (r0377 - r0233) [mH] * r0234 [µF]) 
  Linear motor connected to a high-frequency converter: p1082 [m/min] <= 0.6894 * (p0316 + square root(p0316^2 + 1.91865E-7 * p0297 * r0313^2 / r0377 + r0233) [mH] * r0234 [µF]) 
  Rotary induction motor connected to a high-frequency converter: p1082 [rpm] <= Maximum (2.11383E5 / (r313 * square root((r0377 [mH] + r0382 [mH]) * r0234 [µF])); 0.6364*p0297*p0311/r0304) 
  use a voltage protection module (VPM) in conjunction with the function "Safe Torque Off" (p9601, p9801) (only for synchronous motors). 
  When using a VPM, p0643 must be set to 1. 
  - activating the internal voltage protection (IVP) with p1231 = 3 (only for synchronous motors). 
  See also: p0643 (Overvoltage protection for synchronous motors), p1231 (Armature short-circuit / DC braking configuration). |
| Fault value (r0949, interpret hexadecimal): Associated Drive Data Set (DDS). |

#### F07433  Drive: Closed-loop control with encoder is not possible as the encoder has not been unparked

<table>
<thead>
<tr>
<th>Message value:</th>
<th>%1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive object:</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
</tr>
<tr>
<td>Reaction:</td>
<td>NONE (OFF1, OFF2, OFF3)</td>
</tr>
<tr>
<td>Acknowledge:</td>
<td>IMMEDIATELY</td>
</tr>
<tr>
<td>Cause:</td>
<td>The changeover to closed-loop control with encoder is not possible as the encoder has not been unparked.</td>
</tr>
</tbody>
</table>
| Remedy:        | - check whether the encoder firmware supports the "parking" function (r0481.6 = 1). 
  - upgrade the firmware. |
Note:
For long-stator motors (p3870.0 = 1), the following applies:
The encoder must have completed the unparking procedure (r3875.0 = 1) before a changeover can be made to closed-loop control with encoder. The encoder is unparked using binector input p3876 = 0/1 signal and remains until a 0 signal in this state.

F07434  Drive: It is not possible to change the direction of rotation with the pulses enabled
Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF2
Acknowledge: IMMEDIATELY
Cause: A drive data set was selected - with the pulses enabled - which has a different parameterized direction of rotation (p1821).
It is only possible to change the motor direction of rotation using p1821 when the pulses are inhibited.
Remedy: - change over the drive data set with the pulses inhibited.
- ensure that the changeover to a drive data set does not result in the motor direction of rotation being changed (i.e. for these drive data sets, the same value must be in p1821).
See also: p1821 (Dir of rot)

F07439  Drive: Higher current controller dynamic performance not possible
Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF2 (NONE)
Acknowledge: IMMEDIATELY
Cause: The function "Current controller dynamics higher" (p1810.11 = 1) is selected, however is not supported by the power unit (r0192.27 = 0) or by the safety technology without encoder (9506 = 1).
Fault value (r0949, decimal interpretation):
1:
- firmware of the booksize power unit is not up-to-date.
- blocksize or S120 combi power unit was used.
2:
- a sine-cosine encoder with encoderless safety technology is used.
Remedy: In general:
- Deselect the function "Current controller dynamics higher" (p1810.11 = 0) and if required, set the current, speed and position controller again or calculate (p0340 = 4).
For fault value = 1:
- If necessary, upgrade the firmware of the booksize power unit to a later version (version >= 4.4).
- Use a booksize power unit (version >= 4.4).
For fault value = 2:
- Re-parameterize encoderless safety technology (9506 = 1) to safety technology with an encoder (p9506 = 0).
See also: r0192 (Power unit firmware properties), p1810 (Modulator configuration), p9506 (SI Motion function specification (processor 1))

A07440  EPOS: Jerk time is limited
Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: The calculation of the jerk time Tr = max(p2572, p2573) / p2574 resulted in an excessively high value so that the jerk time is internally limited to 1000 ms.
Note:
The alarm is also output if jerk limiting is not active.
Remedy: - increase the jerk limiting (p2574).
- reduce maximum acceleration or maximum deceleration (p2572, p2573).
See also: p2572 (EPOS maximum acceleration), p2573 (EPOS maximum deceleration), p2574 (EPOS jerk limiting)
<table>
<thead>
<tr>
<th>ID</th>
<th>Description</th>
<th>Message value</th>
<th>Drive object</th>
<th>Reaction</th>
<th>Acknowledge</th>
<th>Cause</th>
<th>Remedy</th>
<th>See also</th>
</tr>
</thead>
<tbody>
<tr>
<td>A07441</td>
<td>LR: Save the position offset of the absolute encoder adjustment</td>
<td>-</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>NONE</td>
<td>NONE</td>
<td>The status of the absolute encoder adjustment has changed. In order to permanently save the determined position offset (p2525) it must be saved in a non-volatile fashion (p0971, p0977).</td>
<td>Not necessary. This alarm automatically disappears after the offset has been saved. See also: p2507 (LR absolute encoder adjustment status), p2525 (LR encoder adjustment, offset)</td>
<td></td>
</tr>
<tr>
<td>F07442</td>
<td>LR: Multiturn does not match the modulo range</td>
<td>-</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>OFF1 (OFF2, OFF3)</td>
<td>IMMEDIATELY</td>
<td>The ratio between the multiturn resolution and the modulo range (p2576) is not an integer number. This results in the adjustment being set back, as the position actual value cannot be reproduced after power-off/power-on.</td>
<td>Make the ratio between the multiturn resolution and the modulo range an integer number. The ratio ( v ) is calculated as follows: 1. Motor encoder without position tracking: ( v = (p0421 \times p2506 \times p0433 \times p2505) / (p0432 \times p2504 \times p2576) ) 2. Motor encoder with position tracking for the measuring gear: ( v = (p0412 \times p2506 \times p2505) / (p2504 \times p2576) ) 3. Motor encoder with position tracking for the load gear: ( v = (p2721 \times p2506 \times p0433) / (p0432 \times p2576) ) 4. Motor encoder with position tracking for the load and measuring gear: ( v = (p2721 \times p2506) / p2576 ) 5. Direct encoder without position tracking: ( v = (p0421 \times p2506 \times p0433) / (p2504 \times p2576) ) 6. Direct encoder with position tracking for the measuring gear: ( v = (p0412 \times p2506) / p2576 ) Note: With position tracking, it is recommended that p0412 and p2721 are changed See also: p0432, p0433, p2504, p2505, p2506, p2576, p2721</td>
<td></td>
</tr>
<tr>
<td>F07443</td>
<td>LR: Reference point coordinate not in the permissible range</td>
<td>%1</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>OFF1 (OFF2, OFF3)</td>
<td>IMMEDIATELY</td>
<td>The reference point coordinate received when adjusting the encoder via connector input p2599 lies outside the half of the encoder range and cannot be set as actual axis position. Fault value (r0949, decimal interpretation): Maximum permissible value for the reference point coordinate.</td>
<td>Set the reference point coordinate to a lower value than specified in the fault value. See also: p2598 (EPOS reference point coordinate, signal source), p2599 (EPOS reference point coordinate value)</td>
<td></td>
</tr>
</tbody>
</table>
**Faults and alarms**

**List of faults and alarms**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Message value</th>
<th>Drive object</th>
<th>Reaction</th>
<th>Acknowledge</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
</table>
| F07446 (A) | **Load gear: Position tracking cannot be reset**                           | %1            | SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN     | OFF1 (OFF2, OFF3) | IMMEDIATELY | The position tracking cannot be reset.                                | Reset the position tracking as follows:  
- select encoder commissioning (p0010 = 4).  
- reset position tracking, position (p2720.2 = 1).  
- de-select encoder commissioning (p0010 = 0).  
The fault should then be acknowledged and, if necessary, the absolute encoder adjusted (p2507). |
| F07447 | **Load gear: Position tracking, maximum actual value exceeded**             | Component number: %1, encoder data set: %2, drive data set: %3 | SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN     | NONE     | IMMEDIATELY | When the position tracking of the load gear is configured, the drive/encoder (motor encoder) identifies a maximum possible absolute position actual value (r2723) that can no longer be represented within 32 bits. Maximum value: p0408 * p2721 * 2^p0419  
Fault value (r0949, interpret hexadecimal): ccbbaa hex  
aa = encoder data set  
bb = component number  
cc = drive data set  
See also: p0408 (Rotary encoder pulse No.), p0419 (Fine resolution absolute value Gx_XIST2 (in bits)), p2721 (Load gear, rotary absolute gearbox, revolutions, virtual) | - reduce the fine resolution (p0419).  
- reduce the multiturn resolution (p2721).  
See also: p0419 (Fine resolution absolute value Gx_XIST2 (in bits)), p2721 (Load gear, rotary absolute gearbox, revolutions, virtual) |
| F07448 (A) | **Load gear: Position tracking, linear axis has exceeded the maximum range** | -              | SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN     | OFF1 (NONE, OFF2, OFF3) | IMMEDIATELY | For a configured linear axis/no modulo axis, the currently effective motor encoder (encoder 1) has exceeded the maximum possible traversing range. For the configured linear axis, the maximum traversing range is defined to be 64x (+/- 32x) of p0421. It should be read in p2721 and interpreted as the number of load revolutions. Note: Only the motor encoder in the currently effective drive data set is monitored here. The actual effective drive data set is displayed in x = r0051 and the corresponding motor encoder is specified in in p0187[x]. | The fault should be resolved as follows:  
- select encoder commissioning (p0010 = 4).  
- reset position tracking, position (p2720.2 = 1).  
- de-select encoder commissioning (p0010 = 0).  
The fault should then be acknowledged and the absolute encoder adjusted. |

**Reaction upon A:** NONE  
**Acknowl. upon A:** NONE
F07449 (A)  Load gear: Position tracking, actual position outside tolerance window

Message value: %1

Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

Reaction: OFF1 (NONE, OFF2, OFF3)

Acknowledge: IMMEDIATELY

Cause: When powered down, the currently effective motor encoder was moved through a distance greater than was parameterized in the tolerance window. It is possible that there is no longer any reference between the mechanical system and encoder.

Note:
- Only the motor encoder in the currently effective drive data set is monitored here. The actual effective drive data set is displayed in x = r0051 and the corresponding motor encoder is specified in in p0187[x].
- Fault value (r0949, decimal interpretation):
  Deviation (difference) to the last encoder position in increments of the absolute value after the measuring gear - if one is being used. The sign designates the traversing direction.

Note:
- The deviation (difference) found is also displayed in r2724.
- See also: p2722 (Load gear, position tracking tolerance window), r2724 (Load gear position difference)

Remedy:
- Reset the position tracking as follows:
  - select encoder commissioning (p0010 = 4).
  - reset position tracking, position (p2720.2 = 1).
  - de-select encoder commissioning (p0010 = 0).
- The fault should then be acknowledged and, if necessary, the absolute encoder adjusted (p2507).
- See also: p0010 (Drive commissioning parameter filter), p2507 (LR absolute encoder adjustment status)

Reaction upon A: NONE

Acknowl. upon A: NONE

F07450 (A)  LR: Standstill monitoring has responded

Message value: -

Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

Reaction: OFF1 (OFF2, OFF3)

Acknowledge: IMMEDIATELY

Cause: After the standstill monitoring time (p2543) expired, the drive left the standstill window (p2542).
- position actual value inversion incorrectly set (p0410).
- standstill window set too small (p2542).
- standstill monitoring time set too low (p2543).
- position loop gain too low (p2538).
- position loop gain too high (instability/oscillation, p2538).
- mechanical overload.
- check the connecting cable, motor/drive converter (phase missing, interchange).
- when selecting motor identification, select tracking mode (BI: p2655[0] = 1 signal).
- when selecting function generator, select tracking mode (BI: p2655[0] = 1 signal) and de-activate position control (BI:p2550 = 0 signal).

Remedy:
- Check the causes and resolve.

Reaction upon A: NONE

Acknowl. upon A: NONE

F07451 (A)  LR: Position monitoring has responded

Message value: -

Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

Reaction: OFF1 (OFF2, OFF3)

Acknowledge: IMMEDIATELY

Cause: When the position monitoring time (p2545) expired, the drive had still not reached the positioning window (p2544).
- positioning window parameterized too small (p2544).
- position monitoring time parameterized too short (p2545).
- position loop gain too low (p2538).
- position loop gain too high (instability/oscillation, p2538).
- drive mechanically locked.

Remedy:
- Check the causes and resolve.
Faults and alarms

List of faults and alarms

Reaction upon A: NONE
Acknowl. upon A: NONE

F07452 (A) LR: Following error too high
Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF1 (OFF2, OFF3)
Acknowledge: IMMEDIATELY
Cause: The difference between the position setpoint position actual value (following error dynamic model, r2563) is greater than the tolerance (p2546).
- the drive torque or accelerating capacity exceeded.
- position measuring system fault.
- position control sense incorrect.
- mechanical system locked.
- excessively high traversing velocity or excessively high position reference value (setpoint) differences
Remedy: Check the causes and resolve.
Reaction upon A: NONE
Acknowl. upon A: NONE

F07453 LR: Position actual value preprocessing error
Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF1 (OFF2, OFF3)
Acknowledge: IMMEDIATELY
Cause: An error has occurred during the position actual value preprocessing.
Remedy: Check the encoder for the position actual value preprocessing.
See also: p2502 (LR encoder assignment)

A07454 LR: Position actual value preprocessing does not have a valid encoder
Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: One of the following problems has occurred with the position actual value preprocessing:
- an encoder is not assigned for the position actual value preprocessing (p2502 = 0).
- an encoder is assigned, but no encoder data set (p0187 = 99 or p0188 = 99 or p0189 = 99).
- an encoder an an encoder data set have been assigned, however, the encoder data set does not contain any encoder data (p0400 = 0) or invalid data (e.g. p0408 = 0).
Remedy: Check the drive data sets, encoder data sets and encoder assignment.
See also: p0187 (Encoder 1 encoder data set number), p0188 (Encoder 2 encoder data set number), p0400 (Encoder type selection), p2502 (LR encoder assignment)

A07455 EPOS: Maximum velocity limited
Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: The maximum velocity (p2571) is too high to correctly calculate the modulo correction.
Within the sampling time for positioning (p0115[5]), with the maximum velocity, a maximum of the half modulo length must be moved through. p2571 was limited to this value.
Remedy: - reduce the maximum velocity (p2571).
- increase the sampling time for positioning (p0115[5]).
### A07456  EPOS: Setpoint velocity limited

**Message value:** -

**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:** The actual setpoint velocity is greater than the parameterized maximum velocity (p2571) and is therefore limited.

**Remedy:**
- check the entered setpoint velocity.
- reduce the velocity override (CI: p2646).
- increase the maximum velocity (p2571).
- check the signal source for the externally limited velocity (CI: p2594).

### A07457  EPOS: Combination of input signals illegal

**Message value:** %1

**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:** An illegal combination of input signals that are simultaneously set was identified. Alarm value (r2124, interpret decimal):
- 0: Jog 1 and jog 2 (p2589, p2590).
- 1: Jog 1 or jog 2 and direct setpoint input/MDI (p2589, p2590, p2647).
- 2: Jog 1 or jog 2 and start referencing (p2589, p2590, p2595).
- 3: Jog 1 or jog 2 and activate traversing task (p2589, p2590, p2631).
- 4: Direct setpoint input/MDI and starting referencing (p2647, p2595).
- 5: Direct setpoint input/MDI and activate traversing task (p2647, p2631).
- 6: Start referencing and activate traversing task (p2595, p2631).

**Remedy:** Check the appropriate input signals and correct.

### F07458  EPOS: Reference cam not found

**Message value:** -

**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

**Reaction:** OFF1 (OFF2, OFF3)

**Acknowledge:** IMMEDIATELY

**Cause:** After starting the search for reference, the axis moved through the maximum permissible distance to search for the reference cam without actually finding the reference cam.

**Remedy:**
- check the "reference cam" bincr input (Bi: p2612).
- check the maximum permissible distance to the reference cam (p2606).
- if axis does not have any reference cam, then set p2607 to 0.

See also: p2606 (EPOS search for reference, reference cam, maximum distance), p2607 (EPOS search for reference, reference cam present), p2612 (EPOS search for reference, reference cam)

### F07459  EPOS: No zero mark

**Message value:** -

**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

**Reaction:** OFF1 (OFF2, OFF3)

**Acknowledge:** IMMEDIATELY

**Cause:** After leaving the reference cam, the axis has traversed the maximum permissible distance between the reference cam and zero mark without finding the zero mark.

**Remedy:**
- check the encoder regarding the zero mark.
- check the maximum permissible distance between the reference cam and zero mark (p2609).
- use an external encoder zero mark (equivalent zero mark) (p0495).

See also: p0495 (Equivalent zero mark, input terminal), p2609 (EPOS search for reference, max. distance ref. cam and zero mark)
F07460  EPOS: End of reference cam not found
Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF1 (OFF2, OFF3)
Acknowledge: IMMEDIATELY
Cause: During the search for reference, when the axis reached the zero mark it also reached the end of the traversing range without detecting an edge at the binector input "reference cam" (BI: p2612). Maximum traversing range: -2147483648 [LU] ... -2147483647 [LU]
Remedy: - check the "reference cam" binector input (BI: p2612).
- repeat the search for reference.
See also: p2612 (EPOS search for reference, reference cam)

A07461  EPOS: Reference point not set
Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: When starting a traversing block/direct setpoint input, a reference point is not set (r2684.11 = 0).
Remedy: Reference the system (search for reference, flying referencing, set reference point).

A07462  EPOS: Selected traversing block number does not exist
Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: A traversing block selected via BI: p2625 to BI: p2630 was started via BI: p2631 = 0/1 edge "Activate traversing task".
- the number of the started traversing block is not contained in p2616[0...n].
- the started traversing block is suppressed.
Alarm value (r2124, interpret decimal):
Number of the selected traversing block that is also not available.
Remedy: - correct the traversing program.
- select an available traversing block number.

A07463 (F)  EPOS: External block change not requested in the traversing block
Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: For a traversing block with the block change enable CONTINUEEXTERNAL_ALARM, the external block change was not requested.
Alarm value (r2124, interpret decimal):
Number of the traversing block.
Remedy: Resolve the reason as to why the edge is missing at binector input (BI: p2632).
Reaction upon F: OFF1
Acknowl. upon F: IMMEDIATELY

F07464  EPOS: Traversing block is inconsistent
Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF1 (OFF2, OFF3)
Acknowledge: IMMEDIATELY
Cause: The traversing block does not contain valid information.
Alarm value (r2124, interpret decimal):
Number of the traversing block with invalid information.
Remedy: Check the traversing block and where relevant, take into consideration alarms that are present.
## List of faults and alarms

### A07465
**EPOS: Traversing block does not have a subsequent block**
- **Message value:** %1
- **Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
- **Reaction:** NONE
- **Acknowledge:** NONE
- **Cause:** There is no subsequent block in the traversing block.  
  Alarm value (r2124, interpret decimal):  
  Number of the traversing block with the missing subsequent block.
- **Remedy:**  
  - parameterize this traversing block with the block change enable END.  
  - parameterize additional traversing blocks with a higher block number and for the last block, using the block change enable END.

### A07466
**EPOS: Traversing block number assigned a multiple number of times**
- **Message value:** %1
- **Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
- **Reaction:** NONE
- **Acknowledge:** NONE
- **Cause:** The same traversing block number was assigned a multiple number of times.  
  Alarm value (r2124, interpret decimal):  
  Number of the traversing block that was assigned a multiple number of times.
- **Remedy:** Correct the traversing blocks.

### A07467
**EPOS: Traversing block has illegal task parameters**
- **Message value:** %1
- **Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
- **Reaction:** NONE
- **Acknowledge:** NONE
- **Cause:** The task parameter in the traversing block contains an illegal value.  
  Alarm value (r2124, interpret decimal):  
  Number of the traversing block with an illegal task parameter.
- **Remedy:** Correct the task parameter in the traversing block.

### A07468
**EPOS: Traversing block jump destination does not exist**
- **Message value:** %1
- **Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
- **Reaction:** NONE
- **Acknowledge:** NONE
- **Cause:** In a traversing block, a jump was programmed to a non-existent block.  
  Alarm value (r2124, interpret decimal):  
  Number of the traversing block with a jump destination that does not exist.
- **Remedy:**  
  - correct the traversing block.  
  - add the missing traversing block.

### A07469
**EPOS: Traversing block < target position < software limit switch minus**
- **Message value:** %1
- **Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
- **Reaction:** NONE
- **Acknowledge:** NONE
- **Cause:** In the traversing block the specified absolute target position lies outside the range limited by the software limit switch minus.  
  Alarm value (r2124, interpret decimal):  
  Number of the traversing block with illegal target position.
- **Remedy:**  
  - correct the traversing block.  
  - change software limit switch minus (CI: p2578, p2580).
A07470  EPOS: Traversing block > target position > software limit switch plus
Message value:  %1
Drive object:  SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction:  NONE
Acknowledge:  NONE
Cause:  In the traversing block the specified absolute target position lies outside the range limited by the software limit switch plus.
       Alarm value (r2124, interpret decimal):
       Number of the traversing block with illegal target position.
Remedy:
- correct the traversing block.
- change software limit switch plus (CI: p2579, p2581).

A07471  EPOS: Traversing block target position outside the modulo range
Message value:  %1
Drive object:  SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction:  NONE
Acknowledge:  NONE
Cause:  In the traversing block the target position lies outside the modulo range.
       Alarm value (r2124, interpret decimal):
       Number of the traversing block with illegal target position.
Remedy:
- in the traversing block, correct the target position.
- change the modulo range (p2576).

A07472  EPOS: Traversing block ABS_POS/ABS_NEG not possible
Message value:  %1
Drive object:  SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction:  NONE
Acknowledge:  NONE
Cause:  In the traversing block the positioning mode ABS_POS or ABS_NEG were parameterized with the modulo correction not activated.
       Alarm value (r2124, interpret decimal):
       Number of the traversing block with the illegal positioning mode.
Remedy:
Correct the traversing block.

A07473 (F)  EPOS: Beginning of traversing range reached
Message value:  -
Drive object:  SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction:  NONE
Acknowledge:  NONE
Cause:  When traversing, the axis has moved to the traversing range limit.
Remedy:
Move away in the positive direction.
Reaction upon F:  OFF1 (OFF2, OFF3)
Acknowl. upon F:  IMMEDIATELY

A07474 (F)  EPOS: End of traversing range reached
Message value:  -
Drive object:  SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction:  NONE
Acknowledge:  NONE
Cause:  When traversing, the axis has moved to the traversing range limit.
Remedy:
Move away in the negative direction.
Reaction upon F:  OFF1 (OFF2, OFF3)
Acknowl. upon F:  IMMEDIATELY
### F07475 (A) EPOS: Target position < start of traversing range

**Message value:** -

**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

**Reaction:** OFF1 (OFF2, OFF3)

**Acknowledge:** IMMEDIATELY

**Cause:** The target position for relative traversing lies outside the traversing range.

**Remedy:** Correct the target position.

**Reaction upon A:** NONE

**Acknowl. upon A:** NONE

### F07476 (A) EPOS: Target position > end of the traversing range

**Message value:** -

**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

**Reaction:** OFF1 (OFF2, OFF3)

**Acknowledge:** IMMEDIATELY

**Cause:** The target position for relative traversing lies outside the traversing range.

**Remedy:** Correct the target position.

**Reaction upon A:** NONE

**Acknowl. upon A:** NONE

### A07477 (F) EPOS: Target position < software limit switch minus

**Message value:** -

**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:** In the actual traversing operation, the target position is less than the software limit switch minus.

**Remedy:**
- correct the target position.
- change software limit switch minus (CI: p2578, p2580). See also: p2578 (EPOS software limit switch minus signal source), p2580 (EPOS software limit switch minus), p2582 (EPOS software limit switch activation)

**Reaction upon F:** OFF1 (OFF2, OFF3)

**Acknowl. upon F:** IMMEDIATELY

### A07478 (F) EPOS: Target position > software limit switch plus

**Message value:** -

**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:** In the actual traversing operation, the target position is greater than the software limit switch plus.

**Remedy:**
- correct the target position.
- change software limit switch plus (CI: p2579, p2581). See also: p2579 (EPOS software limit switch plus signal source), p2581 (EPOS software limit switch plus), p2582 (EPOS software limit switch activation)

**Reaction upon F:** OFF1 (OFF2, OFF3)

**Acknowl. upon F:** IMMEDIATELY

### A07479 EPOS: Software limit switch minus reached

**Message value:** -

**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:** The axis is at the position of the software limit switch minus. An active traversing block was interrupted.
<table>
<thead>
<tr>
<th>Fault</th>
<th>Description</th>
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<th>Reaction</th>
<th>Acknowledge</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
</table>
| A07480 | EPOS: Software limit switch plus reached | SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN | NONE | NONE | The axis is at the position of the software limit switch plus. An active traversing block was interrupted. | - correct the target position.  
- change software limit switch plus (CI: p2579, p2581).  
See also: p2579 (EPOS software limit switch plus signal source), p2581 (EPOS software limit switch plus), p2582 (EPOS software limit switch activation) |

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</table>
| F07481 (A) | EPOS: Axis position < software limit switch minus | SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN | OFF1 (OFF2, OFF3) | IMMEDIATELY | The actual position of the axis is less than the position of the software limit switch minus. | - correct the target position.  
- change software limit switch minus (CI: p2578, p2580).  
See also: p2578 (EPOS software limit switch minus signal source), p2580 (EPOS software limit switch minus), p2582 (EPOS software limit switch activation) |

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</tr>
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</table>
| F07482 (A) | EPOS: Axis position > software limit switch plus | SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN | OFF1 (OFF2, OFF3) | IMMEDIATELY | The actual position of the axis is greater than the position of the software limit switch plus. | - correct the target position.  
- change software limit switch plus (CI: p2579, p2581).  
See also: p2579 (EPOS software limit switch plus signal source), p2581 (EPOS software limit switch plus), p2582 (EPOS software limit switch activation) |

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</table>
| A07483 | EPOS: Travel to fixed stop clamping torque not reached | SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN | NONE | NONE | The fixed stop in the traversing block was reached without the clamping torque/clamping force having been achieved. | - Check the maximum torque-generating current (r1533).  
- check the torque limits (p1520, p1521).  
- check the power limits (p1530, p1531).  
- check the BICO interconnections of the torque limits (p1522, p1523, p1528, p1529). |
### Faults and alarms

#### F07484  EPOS: Fixed stop outside the monitoring window
- **Message value:**
- **Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
- **Reaction:** OFF3 (OFF1, OFF2)
- **Acknowledge:** IMMEDIATELY
- **Cause:**
  In the "fixed stop reached" state, the axis has moved outside the defined monitoring window (p2635).
- **Remedy:**
  - check the monitoring window (p2635).
  - check the mechanical system.

#### F07485 (A)  EPOS: Fixed stop not reached
- **Message value:**
- **Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
- **Reaction:** OFF1 (OFF2, OFF3)
- **Acknowledge:** IMMEDIATELY
- **Cause:**
  In a traversing block with the task FIXED STOP, the end position was reached without detecting a fixed stop.
- **Remedy:**
  - check the traversing block and locate the target position further into the workpiece.
  - check the "fixed stop reached" control signal (p2637).
  - if required, reduce the maximum following error window to detect the fixed stop (p2634).
- **Reaction upon A:** NONE
- **Acknowl. upon A:** NONE

#### A07486  EPOS: Intermediate stop missing
- **Message value:**
- **Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
- **Reaction:** NONE
- **Acknowledge:** NONE
- **Cause:**
  In the modes "traversing blocks" or "direct setpoint input/MDI" at the start of motion, the binector input "no intermediate stop/intermediate stop" (BI: p2640) did not have a 1 signal.
- **Remedy:**
  Connect a 1 signal to the binector input "no intermediate stop/intermediate stop" (BI: p2640) and re-start motion. See also: p2640 (EPOS intermediate stop (0 signal))

#### A07487  EPOS: Reject traversing task missing
- **Message value:**
- **Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
- **Reaction:** NONE
- **Acknowledge:** NONE
- **Cause:**
  In the modes "traversing blocks" or "direct setpoint input/MDI" at the start of motion, the binector input "do not reject traversing task/reject traversing task" (BI: p2641) does not have a 1 signal.
- **Remedy:**
  Connect a 1 signal to the binector input "do not reject traversing task/reject traversing task" (BI: p2641) and restart motion. See also: p2641 (EPOS reject traversing task (0 signal))

#### F07488  EPOS: Relative positioning not possible
- **Message value:**
- **Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
- **Reaction:** OFF1 (OFF2, OFF3)
- **Acknowledge:** IMMEDIATELY
- **Cause:**
  In the mode "direct setpoint input/MDI", for continuous transfer (p2649 = 1) relative positioning was selected (BI: p2648 = 0 signal).
- **Remedy:**
  Check the control.
Faults and alarms

List of faults and alarms

A07489  EPOS: Reference point correction outside the window
Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: For the function "flying referencing" the difference between the measured position at the measuring probe and the reference point coordinate lies outside the parameterized window.
Remedy:
- check the mechanical system.
- check the parameterization of the window (p2602).

F07490  EPOS: Enable signal withdrawn while traversing
Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF1 (OFF2, OFF3)
Acknowledge: IMMEDIATELY
Cause:
- for a standard assignment, another fault may have occurred as a result of withdrawing the enable signals.
- the drive is in the "switching on inhibited" state (for a standard assignment).
Remedy:
- set the enable signals or check the cause of the fault that first occurred and then result (for a standard assignment).
- check the assignment to enable the basic positioning function.

F07491 (A)  EPOS: STOP cam minus reached
Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF3
Acknowledge: IMMEDIATELY
Cause:
A 0 signal was detected at binector input BI: p2569, i.e. the STOP cam minus was reached.
For a positive traversing direction, the STOP cam minus was reached - i.e. the wiring of the STOP cam is incorrect.
See also: p2569 (EPOS STOP cam minus)
Remedy:
- leave the STOP cam minus in the positive traversing direction and return the axis to the valid traversing range.
- check the wiring of the STOP cam.

F07492 (A)  EPOS: STOP cam plus reached
Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF3
Acknowledge: IMMEDIATELY
Cause:
A 0 signal was detected at binector input BI: p2570, i.e. the STOP cam plus was reached.
For a negative traversing direction, the STOP cam plus was reached - i.e. the wiring of the STOP cam is incorrect.
See also: p2570 (EPOS STOP cam plus)
Remedy:
- leave the STOP cam plus in the negative traversing direction and return the axis to the valid traversing range.
- check the wiring of the STOP cam.

F07493  LR: Overflow of the value range for position actual value
Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF1 (OFF2, OFF3)
Acknowledge: IMMEDIATELY
Cause:
The value range (-2147483648 ... 2147483647) for the position actual value representation was exceeded.
When the overflow occurs, the "referenced" or "adjustment absolute measuring system" status is reset.
Fault value (r0949, decimal interpretation):
1: The position actual value (r2521) has exceeded the value range.
2: The encoder position actual value Gn_XIST2 (r0483) or the absolute value after the load gear (r2723) has exceeded the value range.
3: The maximum encoder value times the factor to convert the absolute position (r0483 and/or r2723) from increments to length units (LU) has exceeded the value range for displaying the position actual value.

Remedy:
If required, reduce the traversing range or position resolution (p2506).
Increase the fine resolution of absolute position actual value (p0419).
Note for fault value = 3:
If the value for the maximum possible absolute position (LU) is greater than 4294967296, then it is not possible to make an adjustment due to an overflow.
For rotary encoders, the maximum possible absolute position (LU) is calculated as follows:
1. Motor encoder without position tracking
   \[ p2506 \times p0433 \times p2505 \div (p0432 \times p2504) \]
   \[ p2506 \times p0433 \times p2505 \times p0421 \div (p0432 \times p2504) \] for multiturn encoders
2. Motor encoder with position tracking for measuring gear:
   \[ p2506 \times p0412 \times p2505 \div p2504 \]
3. Motor encoder with position tracking for load gear
   \[ p2506 \times p2721 \times p0433 \div p0432 \]
4. Motor encoder with position tracking for load and measuring gear
   \[ p2506 \times p2721 \]
5. Direct encoder without position tracking
   \[ p2506 \times p0433 \div p0432 \]
   \[ p2506 \times p0433 \times p0421 \div p0432 \] for multiturn encoders
6. Direct encoder with position tracking for measuring gear
   \[ p2506 \times p0412 \]

F07494 LR: Drive Data Set changeover in operation
Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF1 (OFF2, OFF3)
Acknowledge: IMMEDIATELY
Cause: A Drive Data Set changeover (DDS) with a change of the mechanical relationships (p2503 ... 2506), direction of rotation (p1821) or the encoder assignment (p2502) was requested in operation.
Note:
DDS: Drive Data Set
Remedy:
To changeover the drive data set, initially, exit the "operation" mode.

A07495 (F) LR: Reference function interrupted
Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: An activated reference function (reference mark search or measuring probe evaluation) was interrupted.
- an encoder fault has occurred (Gn_ZSW.15 = 1).
- position actual value was set during an activated reference function.
- simultaneously activate reference mark search and measuring probe evaluation (Bi: p2508 and Bi: p2509 = 1 signal).
- activated reference function (reference mark search or measuring probe evaluation) was de-activated (Bi: p2508 and Bi: p2509 = 0 signal).
Remedy:
- check the causes and resolve.
- reset the control (Bi: p2508 and Bi: p2509 = 0 signal) and activate the requested function.
Reaction upon F: OFF1 (OFF2, OFF3)
Acknowl. upon F: IMMEDIATELY
## Faults and alarms

### List of faults and alarms

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A07496</td>
<td><strong>EPOS: Enable not possible</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Message value:</strong> %1</td>
</tr>
<tr>
<td></td>
<td><strong>Drive object:</strong> SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
</tr>
<tr>
<td></td>
<td><strong>Reaction:</strong> NONE</td>
</tr>
<tr>
<td></td>
<td><strong>Acknowledge:</strong> NONE</td>
</tr>
<tr>
<td></td>
<td><strong>Cause:</strong> It is not possible to enable the basic positioner because at least one signal is missing.</td>
</tr>
<tr>
<td></td>
<td>Alarm value (r2124, interpret decimal):</td>
</tr>
<tr>
<td></td>
<td>1: EPOS enable missing (BI: p2656).</td>
</tr>
<tr>
<td></td>
<td>2: Position actual value, valid feedback signal missing (BI: p2658).</td>
</tr>
<tr>
<td></td>
<td>See also: p2656 (EPOS enable basic positioner), p2658 (EPOS pos. actual value valid, feedback signal)</td>
</tr>
<tr>
<td></td>
<td><strong>Remedy:</strong> Check the appropriate binector inputs and signals.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A07497</td>
<td><strong>LR: Position setting value activated</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Message value:</strong> -</td>
</tr>
<tr>
<td></td>
<td><strong>Drive object:</strong> SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
</tr>
<tr>
<td></td>
<td><strong>Reaction:</strong> NONE</td>
</tr>
<tr>
<td></td>
<td><strong>Acknowledge:</strong> NONE</td>
</tr>
<tr>
<td></td>
<td><strong>Cause:</strong> The position actual value is set to the value received via CI: p2515 while BI: p2514 = 1 signal. A possible system deviation cannot be corrected.</td>
</tr>
<tr>
<td></td>
<td><strong>Remedy:</strong> Not necessary.</td>
</tr>
<tr>
<td></td>
<td>The alarm automatically disappears with BI: p2514 = 0 signal.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A07498 (F)</td>
<td><strong>LR: Measuring probe evaluation not possible</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Message value:</strong> %1</td>
</tr>
<tr>
<td></td>
<td><strong>Drive object:</strong> SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
</tr>
<tr>
<td></td>
<td><strong>Reaction:</strong> NONE</td>
</tr>
<tr>
<td></td>
<td><strong>Acknowledge:</strong> NONE</td>
</tr>
<tr>
<td></td>
<td><strong>Cause:</strong> When evaluating the measuring probe, an error occurred.</td>
</tr>
<tr>
<td></td>
<td>Alarm value (r2124, interpret decimal):</td>
</tr>
<tr>
<td></td>
<td>6: The input terminal for the measuring probe is not set.</td>
</tr>
<tr>
<td></td>
<td>4098: Error when initializing the measuring probe.</td>
</tr>
<tr>
<td></td>
<td>4100: The measuring pulse frequency is too high.</td>
</tr>
<tr>
<td></td>
<td>&gt; 50000: The measuring clock cycle is not a multiple integer of the position controller clock cycle.</td>
</tr>
<tr>
<td></td>
<td><strong>Remedy:</strong> De-activate the measuring probe evaluation (BI: p2509 = 0 signal).</td>
</tr>
<tr>
<td></td>
<td>Re alarm value = 6:</td>
</tr>
<tr>
<td></td>
<td>Set the input terminal for the measuring probe (p0488, p0489 or p2517, p2518).</td>
</tr>
<tr>
<td></td>
<td>Re alarm value = 4098:</td>
</tr>
<tr>
<td></td>
<td>Check the Control Unit hardware.</td>
</tr>
<tr>
<td></td>
<td>Re alarm value = 4100:</td>
</tr>
<tr>
<td></td>
<td>Reduce the frequency of the measuring pulses at the measuring probe.</td>
</tr>
<tr>
<td></td>
<td>Re alarm value &gt; 50000:</td>
</tr>
<tr>
<td></td>
<td>Set the clock cycle ratio of the measuring clock cycle to the position controller clock cycle to an integer multiple.</td>
</tr>
<tr>
<td></td>
<td>To do this, the currently effective measuring clock cycle can be determined from the alarm value as follows:</td>
</tr>
<tr>
<td></td>
<td>Tmeas [125 µs] = alarm value - 50000</td>
</tr>
<tr>
<td></td>
<td>With PROFIBUS, the measuring clock cycle corresponds to the PROFIBUS clock cycle (r2064[1]).</td>
</tr>
<tr>
<td></td>
<td>Without PROFIBUS, the measuring clock cycle is an internal cycle time that cannot be influenced.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>F07499 (A)</td>
<td><strong>EPOS: Reversing cam approached with the incorrect traversing direction</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Message value:</strong> -</td>
</tr>
<tr>
<td></td>
<td><strong>Drive object:</strong> SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
</tr>
<tr>
<td></td>
<td><strong>Reaction:</strong> OFF3</td>
</tr>
<tr>
<td></td>
<td><strong>Acknowledge:</strong> IMMEDIATELY</td>
</tr>
<tr>
<td></td>
<td><strong>Cause:</strong> The reversing cam MINUS was approached in the positive traversing direction or the reversing cam PLUS was approached in the negative traversing direction.</td>
</tr>
</tbody>
</table>
See also: p2613 (EPOS search for reference reversing cam minus), p2614 (EPOS search for reference reversing cam plus)

Remedy:
- check the wiring of the reversing cam (BI: p2613, BI: p2614).
- check the traversing direction to approach the reversing cam.

Reaction upon A: NONE
Acknow. upon A: NONE

**F07500 Drive: Power unit data set PDS not configured**

**Message value:** Drive data set: %1  
**Drive object:** All objects  
**Reaction:** NONE  
**Acknowledge:** IMMEDIATELY  
**Cause:** Only for controlled line supply infeed/regenerative feedback units:  
The power unit data set was not configured - this means that a data set number was not entered into the drive data set.  
Fault value (r0949, decimal interpretation):  
The fault value is increased by 100 * encoder number (e.g. for p0189: Fault value 3xx with xx = data set number).  
**Remedy:** The index of the power unit data set associated with the drive data set should be entered into p0185.

**F07501 Drive: Motor Data Set MDS not configured**

**Message value:** Drive data set: %1  
**Drive object:** All objects  
**Reaction:** OFF2  
**Acknowledge:** IMMEDIATELY  
**Cause:** Only for power units:  
The motor data set was not configured - this means that a data set number was not entered into the associated drive data set.  
Fault value (r0949, decimal interpretation):  
The fault value includes the drive data set number of p0186.  
**Remedy:** The index of the motor data set associated with the drive data set should be entered into p0186.  
See also: p0186 (Motor Data Sets (MDS) number)

**F07502 Drive: Encoder Data Set EDS not configured**

**Message value:** Drive data set: %1  
**Drive object:** All objects  
**Reaction:** OFF2  
**Acknowledge:** IMMEDIATELY  
**Cause:** Only for power units:  
The encoder data set was not configured - this means that a data set number was not entered into the associated drive data set.  
Fault value (r0949, decimal interpretation):  
The fault value includes the drive data set number of p0187, p0188 and p0189.  
The fault value is increased by 100 * encoder number (e.g. for p0189: Fault value 3xx with xx = data set number).  
**Remedy:** The index of the encoder data set associated with the drive data set should be entered into p0187 (1st encoder), p0188 (2nd encoder) and p0189 (3rd encoder).

**F07503 EPOS: STOP cam approached with the incorrect traversing direction**

**Message value:** %1  
**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
**Reaction:** NONE (OFF1, OFF2, OFF3)  
**Acknowledge:** IMMEDIATELY  
**Cause:**  
**Remedy:**
A07504  Drive: Motor data set is not assigned to a drive data set
Message value:  %1
Drive object:  SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction:  NONE
Acknowledge:  NONE
Cause:  A motor data set is not assigned to a drive object.
All of the existing motor data sets in the drive data sets must be assigned using the MDS number (p0186[0...n]).
There must be at least as many drive data sets as motor data sets.
Alarm value (%2124, interpret decimal):
Number of the motor data set that has not been assigned.
Remedy:  In the drive data sets, assign the non-assigned motor data set using the MDS number (p0186[0...n]).
- check whether all of the motor data sets are assigned to drive data sets.
- if required, delete superfluous motor data sets.
- if required, set up new drive data sets and assign to the corresponding motor data sets.
See also:  p0186 (Motor Data Sets (MDS) number)

A07505  EPOS: Travel to fixed stop not possible in the V/f control mode
Message value:  %1
Drive object:  SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction:  NONE
Acknowledge:  NONE
Cause:  The traversing task "travel to fixed stop" is not possible in the V/f control mode.
Alarm value (%2124, interpret decimal):
Number of the traversing block with an illegal task parameter.
See also:  p1300 (Open-loop/closed-loop control operating mode), p2621 (EPOS traversing block task)
Remedy:  Change the EPOS traversing block task type or change the open-loop/closed-loop control mode.
See also:  p1300 (Open-loop/closed-loop control operating mode), p2621 (EPOS traversing block task)

F07509  Drive: Component number missing
Message value:  %1
Drive object:  SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction:  OFF2
Acknowledge:  IMMEDIATELY
Cause:  A Drive Data Set (DDS) is assigned to a Motor Data Set (MDS) or Encoder Data Set (EDS) that does not have a component number.
Alarm value (%2124, interpret decimal):
nnnmmmxxyyy
nn: Number of the MDS/EDS.
m: Parameter number of the missing component number.
x: Number of the DDS that is assigned to the MDS/EDS.
yy: Parameter number that references the MDS/EDS.
Example:
p0131[5] = 0: There is no component number set in MDS 5.
Alarm value = 0513107186
Remedy:  In the drive data sets, no longer assign MDS/EDS using p0186, p0187, p0188, p0189 or set a valid component number.
See also:  p0131 (Motor component number), p0141 (Encoder interface (Sensor Module) component number), p0142 (Encoder component number), p0186 (Motor Data Sets (MDS) number), p0187 (Encoder 1 encoder data set number), p0188 (Encoder 2 encoder data set number)

F07511  Drive: Encoder used a multiple number of times
Message value:  %1
Drive object:  All objects
Reaction:  NONE
Acknowledge:  IMMEDIATELY
Cause:  Each encoder may only be assigned to one drive and within a drive must - in each drive data set - either always be encoder 1, always encoder 2 or always encoder 3. This unique assignment has been violated.
Fault value (r0949, decimal interpretation):
The two parameters in coded form, that refer to the same component number.
First parameter:
Index: First and second decimal place (99 for EDS, not assigned DDS)
Parameter number: Third decimal place (1 for p0187, 2 for p0188, 3 for p0189, 4 for EDS not assigned DDS)
Drive number: Fourth and fifth decimal place
Second parameter:
Index: Sixth and seventh decimal place (99 for EDS, not assigned DDS)
Parameter number: Eighth decimal place (1 for p0187, 2 for p0188, 3 for p0189, 4 for EDS, not assigned DDS)
Drive number: Ninth and tenth decimal place
See also: p0141 (Encoder interface (Sensor Module) component number)

Remedy: Correct the double use of a component number using the two parameters coded in the fault value.

A07514 (N) Drive: Data structure does not correspond to the interface module
Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: The interface mode "SIMODRIVE 611 universal" was set (p2038 = 1) and the data structure does not correspond to this mode.
For the data structure, the following rule must be complied with.
Within the group of 8 drive data sets, the assignment to the motor data set must be set the same:
See also: p0180 (Number of Drive Data Sets (DDS)), p0186 (Motor Data Sets (MDS) number), p2038 (IF1 PROFIdrive STW/ZSW interface mode)

Remedy: - structure the data according to the rules of the "SIMODRIVE 611 universal" interface mode.
- check the interface mode (p2038).

Reaction upon N: NONE
Acknowl. upon N: NONE

F07515 Drive: Power unit and motor incorrectly connected
Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF2
Acknowledge: IMMEDIATELY
Cause: A power unit (via PDS) was assigned to a motor (via MDS) in a drive data set that is not connected in the target topology.
Alarm value (r2124, interpret decimal):
Number of the incorrectly parameterized drive data set.

Remedy: - assign the drive data set to a combination of motor and power unit permitted by the target topology.
- adapt the target topology.
See also: p0121 (Power unit component number), p0131 (Motor component number), p0186 (Motor Data Sets (MDS) number)

F07516 Drive: Re-commission the data set
Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: IMMEDIATELY
Cause: The assignment between the drive data set and motor data set (p0186) or between the drive data set and the encoder data set was modified (p0187). This is the reason that the drive data set must re-commissioned.
Fault value (r0949, decimal interpretation):
Drive data set to be re-commissioned.

Remedy: Commission the drive data set specified in the fault value (r0949).
Faults and alarms

List of faults and alarms

F07518 | Drive: Motor data set changeover incorrectly parameterized
---|---
**Message value:** | %1
**Drive object:** | SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
**Reaction:** | NONE
**Acknowledge:** | IMMEDIATELY
**Cause:** | The system has identified that two motor data sets were incorrectly parameterized. Parameter r0313 (calculated from p0314, p0310, p0311), r0315 and p1982 may only have different values if the motor data sets are assigned different motors. p0827 is used to assign the motors and contactors. It is not possible to toggle between motor data sets.
**Alarm value (r2124, interpret hexadecimal):** | xxxxxxxy:
xxxx: First DDS with assigned MDS, yyyy: Second DDS with assigned MDS
**Remedy:** | Correct the parameterization of the motor data sets.

A07519 | Drive: Motor changeover incorrectly parameterized
---|---
**Message value:** | %1
**Drive object:** | SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
**Reaction:** | NONE
**Acknowledge:** | NONE
**Cause:** | With the setting p0833.0 = 1, a motor changeover via the application is selected. This is the reason that p0827 must have different values in the appropriate motor data set.
**Alarm value (r2124, interpret hexadecimal):** | xxxxxxxy:
xxxx: First MDS, yyyy: Second MDS
**Remedy:** | - parameterize the appropriate motor data sets differently (p0827).
- select the setting p0833.0 = 0 (motor changeover via the drive).

A07520 | Drive: Motor cannot be changed over
---|---
**Message value:** | %1
**Drive object:** | SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
**Reaction:** | NONE
**Acknowledge:** | NONE
**Cause:** | The motor cannot be changed over.
**Alarm value (r2124, interpret decimal):**
1: The contactor for the motor that is presently active cannot be opened, because for a synchronous motor, the speed (r0063) is greater than the speed at the start of field weakening (p0348). As long as r0063 > p0348, the current in the motor does not decay in spite of the pulses being suppressed.
2: The “contactor opened” feedback signal was not detected within 1 s.
3: The “contactor closed” feedback signal was not detected within 1 s.
**Remedy:** | Re alarm value = 1:
Set the speed lower than the speed at the start of field weakening (r0063 < p0348).
Re alarm value = 2, 3:
Check the feedback signals of the contactor involved.

A07530 | Drive: Drive Data Set DDS not present
---|---
**Message value:** | -
**Drive object:** | SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
**Reaction:** | NONE
**Acknowledge:** | NONE
**Cause:** | The selected drive data set is not available (p0837 > p0180). The drive data set was not changed over. See also: p0180 (Number of Drive Data Sets (DDS)), p0820 (Drive Data Set selection DDS bit 0), r0837 (Drive Data Set DDS selected)
**Remedy:** | - select the existing drive data set.
- set up additional drive data sets.
### A07531  Drive: Command Data Set CDS not present

<table>
<thead>
<tr>
<th>Message value:</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive object:</td>
<td>All objects</td>
</tr>
<tr>
<td>Reaction:</td>
<td>NONE</td>
</tr>
<tr>
<td>Acknowledge:</td>
<td>NONE</td>
</tr>
<tr>
<td>Cause:</td>
<td>The selected command data set is not available (p0836 &gt; p0170). The command data set was not changed over. See also: p0810 (Command data set selection CDS bit 0), r0836 (Command Data Set CDS selected)</td>
</tr>
</tbody>
</table>
| Remedy:        | - select the existing command data set.  
                 - set up additional command data sets. |

### A07541  Drive: Data set changeover not possible

<table>
<thead>
<tr>
<th>Message value:</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive object:</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
</tr>
<tr>
<td>Reaction:</td>
<td>NONE</td>
</tr>
<tr>
<td>Acknowledge:</td>
<td>NONE</td>
</tr>
<tr>
<td>Cause:</td>
<td>The selected drive data set changeover and the assigned motor changeover are not possible and are not carried out. For synchronous motors, the motor contactor may only be switched for actual speeds less than the speed at the start of field weakening (r0063 &lt; p0348). See also: r0063 (Actual speed smoothed), p0348 (Speed at the start of field weakening Vdc = 600 V)</td>
</tr>
<tr>
<td>Remedy:</td>
<td>Reduce the speed below the speed at the start of field weakening.</td>
</tr>
</tbody>
</table>

### F07545  Drive: Pulse encoder interface parameterized incorrectly

<table>
<thead>
<tr>
<th>Message value:</th>
<th>%1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive object:</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
</tr>
<tr>
<td>Reaction:</td>
<td>OFF2</td>
</tr>
<tr>
<td>Acknowledge:</td>
<td>IMMEDIATELY</td>
</tr>
</tbody>
</table>
| Cause:         | The pulse encoder interface has been parameterized incorrectly. Fault value (r0949, decimal interpretation):  
                 1: The encoder type setting for encoder interface 1 or 2 is not the same for all data sets. Accordingly, the following parameter assignment, for example, would generate a fault:  
                 p0187[0] = 0: Encoder data set 0 is assigned to drive data set 0.  
                 p0400[0] = 9000: A value of 9000 (pulse encoder) is set in encoder data set 0.  
                 2: The setting in p0400 is not compatible with the telegram selection made in p0922 and p2079.  
                 3: A second encoder interface can only be used for pulse encoders (p0184 > 0). |
| Remedy:        | For fault value = 1:  
                 - make the encoder type setting for encoder interface 1 or 2 the same for all data sets.  
                 For fault value = 2:  
                 - if applicable, do not set parameter p0400 to 9000 or 9001  
                 - if you are using the pulse encoder interface (p0400 = 9000, 9001), set up a free telegram configuration first (p0922 = 999 and p2079 = 999)  
                 For fault value = 3:  
                 - Check the setting for the second encoder interface (p0184). |

### A07550 (F, N)  Drive: Not possible to reset encoder parameters

<table>
<thead>
<tr>
<th>Message value:</th>
<th>%1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive object:</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
</tr>
<tr>
<td>Reaction:</td>
<td>NONE</td>
</tr>
<tr>
<td>Acknowledge:</td>
<td>NONE</td>
</tr>
<tr>
<td>Cause:</td>
<td>When carrying out a factory setting (e.g. using p0970 = 1), it was not possible to reset the encoder parameters. The encoder parameters are directly read out of the encoder via DRIVE-CLiQ. Alarm value (r2124, interpret decimal): Component number of the encoder involved.</td>
</tr>
</tbody>
</table>
Faults and alarms

List of faults and alarms

Remedy:
- repeat the operation.
- check the DRIVE-CLiQ connection.

Reaction upon F: NONE (IASC/DCBRAKE, OFF1, OFF2, OFF3, STOP1, STOP2)
Acknowl. upon F: IMMEDIATELY (POWER ON)
Reaction upon N: NONE
Acknowl. upon N: NONE

F07551  Drive encoder: No commutation angle information
Message value:
Fault cause: %1, drive data set: %2
Drive object:
SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction:
OFF2 (IASC/DCBRAKE)
Acknowledge:
IMMEDIATELY (POWER ON)
Cause:
The commutation angle information is missing. This means that synchronous motors cannot be controlled (closed-loop control)
Fault value (r0949, decimal interpretation):

yyyyyyyy dec: yyyy = fault cause, xxxx = drive data set
yyyy = 1 dec:
The motor encoder used does not supply an absolute commutation angle.

yyyy = 2 dec:
The selected ratio of the measuring gear does not match the motor pole pair number.

Remedy:
Re fault cause = 1:
- check the encoder parameterization (p0404).
- use an encoder with track C/D, EnDat interface of Hall sensors.
- use an encoder with sinusoidal A/B track for which the motor pole pair number (r0313) is an integer multiple of
  the encoder pulse number (p0408).
- activate the pole position identification routine (p1982 = 1).

Re fault cause = 2:
- the quotient of the pole pair number divided by the ratio of the measuring gear must be an integer number:
  (p0314 * p0433) / p0432.

Note:
For operation with track C/D, this quotient must be less than 8.
See also: p0404 (Encoder configuration effective), p0432 (Gearbox factor, encoder revolutions), p0433 (Gearbox factor, motor/load revolutions)

F07552 (A)  Drive encoder: Encoder configuration not supported
Message value:
Fault cause: %1, component number: %2, encoder data set: %3
Drive object:
SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction:
OFF2 (IASC/DCBRAKE, NONE, OFF1, OFF3, STOP1, STOP2)
Acknowledge:
IMMEDIATELY (POWER ON)
Cause:
The requested encoder configuration is not supported. Only bits may be requested in p0404 that are signaled as being supported by the encoder evaluation in r0456.
Fault value (r0949, decimal interpretation):

ccccbbbaa hex: cccc = fault cause, bb = component number, aa = encoder data set
cccc = 1: encoder sin/cos with absolute track (is supported by SME26).
cccc = 3: Squarewave encoder (this is supported by SMC30).
cccc = 4: sin/cos encoder (this is supported by SMC20, SM120, SME20, SME25).
cccc = 10: DRIVE-CLiQ encoder (is supported by DQI).
cccc = 12: sin/cos encoder with reference mark (this is supported by SME20).
cccc = 15: Commutation with zero mark for separately-excited synchronous motors with VECTORMV.
cccc = 23: Resolver (this is supported by SM10, SM110).
cccc = 65535: Other function (compare r0456 and p0404).

Note:
See also: p0404 (Encoder configuration effective), r0456 (Encoder configuration supported)

Remedy:
- check the encoder parameterization (p0400, p0404).
- use the matching encoder evaluation (r0456).

Reaction upon A: NONE
Acknowl. upon A: NONE
### F07553 (A)
**Drive encoder: Sensor Module configuration not supported**

**Message value:** Encoder data set: %1, first incorrect bit: %2, incorrect parameter: %3

**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

**Reaction:** OFF2 (IASC/DCBRAKE, NONE, OFF1, OFF3, STOP1, STOP2)

**Acknowledge:** IMMEDIATELY (POWER ON)

**Cause:** The Sensor Module does not support the requested configuration.

For incorrect p0430 (cc = 0), the following applies:
- In p0430 (requested functions), at least 1 bit was set that is not set in r0458 (supported functions) (exception: Bit 19, 28, 29, 30, 31).
- p1982 > 0 (pole position identification requested), but r0458.16 = 0 (pole position identification not supported).

For incorrect p0437 (cc = 1), the following applies:
- In p0437 (requested functions), at least 1 bit was set that is not set in r0459 (supported functions).

Fault value (r0949, interpret hexadecimal):
```
  ddccbbaa hex
  aa: encoder data set number
  bb: first incorrect bit
  cc: incorrect parameter
```

- cc = 0: incorrect parameter is p0430
- cc = 1: incorrect parameter is p0437
- cc = 2: incorrect parameter is r0459

**Remedy:**
- check the encoder parameterization (p0430, p0437).
- check the pole position identification routine (p1982).
- use the matching encoder evaluation (r0458, r0459).

See also: p0430 (Sensor Module configuration), p0437 (Sensor Module configuration extended), r0458 (Sensor Module properties), r0459 (Sensor Module properties extended), p1982 (PolID selection)

---

### F07555 (A)
**Drive encoder: Configuration position tracking**

**Message value:** Component number: %1, encoder data set: %2, drive data set: %3, fault cause: %4

**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

**Reaction:** OFF2 (IASC/DCBRAKE, NONE, OFF1, OFF3, STOP1, STOP2)

**Acknowledge:** IMMEDIATELY (POWER ON)

**Cause:** For position tracking, the configuration is not supported.

Position tracking can only be activated for absolute encoders.

For linear axes, it is not possible to simultaneously activate the position tracking for load and measuring gears.

Fault value (r0949, interpret hexadecimal):
```
  ddccbbaa hex
  aa: encoder data set
  bb: component number
  cc: drive data set
  dd: fault cause
  dd = 00 hex = 0 dec
  An absolute encoder is not being used.
  dd = 01 hex = 1 dec
  Position tracking cannot be activated because the memory of the internal NVRAM is not sufficient or a Control Unit does not have an NVRAM.
  dd = 02 hex = 2 dec
  For a linear axis, the position tracking was activated for the load and measuring gear.
  dd = 03 hex = 3 dec
  Position tracking cannot be activated because position tracking with another gear ratio, axis type or tolerance window has already been detected for this encoder data set.
  dd = 04 hex = 4 dec
  A linear encoder is being used.
```

See also: p0404 (Encoder configuration effective)
## List of faults and alarms

### Remedy:
- use an absolute encoder.
- if necessary, de-select the position tracking (p0411 for the measuring gear, p2720 for the load gear).
- use a Control Unit with sufficient NVRAM.
- Only activate position tracking of the load gear in the same encoder data set if the gear ratio (p2504, p2505), axis type (p2720.1) and tolerance window (p2722) are also the same.

### Reaction upon A:
N/A

### Acknowl. upon A:
N/A

<table>
<thead>
<tr>
<th>Fault Code</th>
<th>Description</th>
<th>Message Value</th>
<th>Drive Object</th>
<th>Reaction</th>
<th>Acknowledge</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>A07557 (F)</td>
<td>Encoder 1: Reference point coordinate not in the permissible range</td>
<td>%1</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>NONE</td>
<td>NONE</td>
<td>The reference point coordinate received when adjusting the encoder via connector input CI:p2599 lies outside the half of the encoder range and cannot be set as actual axis position. The maximum permissible value is displayed in the supplementary information.</td>
<td>Set the reference point coordinate less than the value from the supplementary information. See also: p2598 (EPOS reference point coordinate, signal source)</td>
</tr>
<tr>
<td>A07558 (F)</td>
<td>Encoder 2: Reference point coordinate not in the permissible range</td>
<td>%1</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>NONE</td>
<td>NONE</td>
<td>The reference point coordinate received when adjusting the encoder via connector input CI:p2599 lies outside the half of the encoder range and cannot be set as actual axis position. The maximum permissible value is displayed in the supplementary information.</td>
<td>Set the reference point coordinate less than the value from the supplementary information. See also: p2598 (EPOS reference point coordinate, signal source)</td>
</tr>
<tr>
<td>F07560</td>
<td>Drive encoder: Number of pulses is not to the power of two</td>
<td>Encoder data set: %1</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>OFF2 (IASC/DCBRAKE, NONE, OFF1, OFF3, STOP1, STOP2)</td>
<td>IMMEDIATELY (POWER ON)</td>
<td>For rotary absolute encoders, the pulse number in p0408 must be to the power of two. Fault value (r0949, decimal interpretation): The fault value includes the encoder data set number involved.</td>
<td>- check the parameterization (p0408, p0404.1, r0458.5). - upgrade the Sensor Module firmware if necessary</td>
</tr>
<tr>
<td>F07561</td>
<td>Drive encoder: Number of multiturn pulses is not to the power of two</td>
<td>Encoder data set: %1</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>OFF2 (IASC/DCBRAKE, NONE, OFF1, OFF3, STOP1, STOP2)</td>
<td>IMMEDIATELY (POWER ON)</td>
<td>The multiturn resolution in p0421 must be to the power of two. Fault value (r0949, decimal interpretation): The fault value includes the encoder data set number involved.</td>
<td>- check the parameterization (p0421, p0404.1, r0458.5). - upgrade the Sensor Module firmware if necessary</td>
</tr>
</tbody>
</table>
### F07562 (A)

**Drive, encoder: Position tracking, incremental encoder not possible**

<table>
<thead>
<tr>
<th><strong>Message value:</strong></th>
<th>Fault cause: %1, component number: %2, encoder data set: %3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drive object:</strong></td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
</tr>
<tr>
<td><strong>Reaction:</strong></td>
<td>OFF2 (IASC/DCBRAKE, NONE, OFF1, OFF3, STOP1, STOP2)</td>
</tr>
<tr>
<td><strong>Acknowledge:</strong></td>
<td>IMMEDIATELY (POWER ON)</td>
</tr>
</tbody>
</table>
| **Cause:**         | The requested position tracking for incremental encoders is not supported. Fault value (r0949, interpret hexadecimal):  
ccccbbaa hex  
aa = encoder data set  
b = component number  
cccc = fault cause  
cccc = 00 hex = 0 dec  
The encoder type does not support the "Position tracking incremental encoder" function.  
Position tracking cannot be activated because the memory of the internal NVRAM is not sufficient or a Control Unit does not have an NVRAM.  
cccc = 04 hex = 4 dec  
A linear encoder is used that does not support the "position tracking" function.  
See also: p0404 (Encoder configuration effective), r0456 (Encoder configuration supported)  
Remedy:  
- check the encoder parameterization (p0400, p0404).  
- use a Control Unit with sufficient NVRAM.  
- if required, de-select position tracking for the incremental encoder (p0411.3 = 0).  

| **Reaction upon A:** | NONE |
| **Acknowl. upon A:** | NONE |

### A07565 (F, N)

**Drive: Encoder error in PROFIdrive encoder interface 1**

<table>
<thead>
<tr>
<th><strong>Message value:</strong></th>
<th>%1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drive object:</strong></td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
</tr>
<tr>
<td><strong>Reaction:</strong></td>
<td>NONE</td>
</tr>
<tr>
<td><strong>Acknowledge:</strong></td>
<td>NONE</td>
</tr>
</tbody>
</table>
| **Cause:**         | An encoder error was signaled for encoder 1 via the PROFIdrive encoder interface (G1_ZSW.15).  
Alarm value (r2124, interpret decimal):  
Error code from G1_XIST2, refer to the description regarding r0483.  
Note: This alarm is only output if p0480[0] is not equal to zero.  
Remedy:  
- Acknowledge the encoder error using the encoder control word (G1_STW.15 = 1).  
| **Reaction upon F:** | NONE (OFF1, OFF2, OFF3) |
| **Acknowl. upon F:** | IMMEDIATELY |
| **Reaction upon N:** | NONE |
| **Acknowl. upon N:** | NONE |

### A07566 (F, N)

**Drive: Encoder error in PROFIdrive encoder interface 2**

<table>
<thead>
<tr>
<th><strong>Message value:</strong></th>
<th>%1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drive object:</strong></td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
</tr>
<tr>
<td><strong>Reaction:</strong></td>
<td>NONE</td>
</tr>
<tr>
<td><strong>Acknowledge:</strong></td>
<td>NONE</td>
</tr>
</tbody>
</table>
| **Cause:**         | An encoder error was signaled for encoder 2 via the PROFIdrive encoder interface (G2_ZSW.15).  
Alarm value (r2124, interpret decimal):  
Error code from G2_XIST2, refer to the description regarding r0483.  
Note: This alarm is only output if p0480[1] is not equal to zero.  
Remedy:  
- Acknowledge the encoder error using the encoder control word (G2_STW.15 = 1).  
| **Reaction upon F:** | NONE (OFF1, OFF2, OFF3) |
| **Acknowl. upon F:** | IMMEDIATELY |
| **Reaction upon N:** | NONE |
| **Acknowl. upon N:** | NONE |
A07569 (F) Encoder could not be identified
Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: During encoder identification (waiting) with p0400 = 10100, the encoder could not be identified. Either the wrong encoder has been installed or no encoder has been installed, the wrong encoder cable has been connected or no encoder cable has been connected to the Sensor Module, or the DRIVE-CLiQ component has not been connected to DRIVE-CLiQ.
Note: Encoder identification must be supported by the encoder and is possible in the following cases:
- Encoder with EnDat interface
- Motor with DRIVE-CLiQ
Remedy: - check and, if necessary, connect the encoder and/or encoder cable.
- check and, if necessary, establish the DRIVE-CLiQ connection.
- in the case of encoders that cannot be identified (e.g. encoders without EnDat interface), the correct encoder type must be entered in p0400.
Reaction upon F: NONE (OFF1, OFF2, OFF3)
Acknowl. upon F: IMMEDIATELY
A07575 Drive: Motor encoder not ready
Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF2 (ENCODER)
Acknowledge: IMMEDIATELY
Cause: The motor encoder signals that it is not ready.
- initialization of encoder 1 (motor encoder) was unsuccessful.
- the function “parking encoder” is active (encoder control word G1_STW.14 = 1).
- the encoder interface (Sensor Module) is de-activated (p0145).
- the Sensor Module is defective.
Remedy: Evaluate other queued faults via encoder 1.
A07576 Drive: Encoderless operation due to a fault active
Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: Encoderless operation is active due to a fault (r1407.13 = 1).
Note: The behavior for faults has been set to ENCODER fault response in p0491.
See also: p0491 (Motor encoder fault response ENCODER)
Remedy: - remove the cause of a possible encoder fault.
- carry out a POWER ON (power off/on) for all components.
A07577 (F) Encoder 1: Measuring probe evaluation not possible
Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: When evaluating the measuring probe, an error occurred.
Alarm value (r2124, interpret decimal):
6: The input terminal for the measuring probe is not set.
4098: Error when initializing the measuring probe.
4100: The measuring pulse frequency is too high.
4200: The PROFIBUS clock cycle is not a multiple of integer of the position controller clock cycle.
Remedy: De-activate the measuring probe evaluation (BI: p2509 = 0 signal).
Re alarm value = 6:
Set the input terminal for the measuring probe (p0488, p0489 or p2517, p2518).
Re alarm value = 4098:
Check the Control Unit hardware.
Re alarm value = 4100:
Reduce the frequency of the measuring pulses at the measuring probe.
Re alarm value = 4200:
Set the clock cycle ratio between the PROFIBUS clock cycle and the position controller clock cycle to an integer multiple.

Reaction upon F: OFF1
Acknowl. upon F: IMMEDIATELY

A07578 (F) Encoder 2: Measuring probe evaluation not possible
Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: When evaluating the measuring probe, an error occurred.
Alarm value (r2124, interpret decimal):
6: The input terminal for the measuring probe is not set.
4098: Error when initializing the measuring probe.
4100: The measuring pulse frequency is too high.
4200: The PROFIBUS clock cycle is not a multiple of integer of the position controller clock cycle.

Remedy: De-activate the measuring probe evaluation (BI: p2509 = 0 signal).
Re alarm value = 6:
Set the input terminal for the measuring probe (p0488, p0489 or p2517, p2518).
Re alarm value = 4098:
Check the Control Unit hardware.
Re alarm value = 4100:
Reduce the frequency of the measuring pulses at the measuring probe.
Re alarm value = 4200:
Set the clock cycle ratio between the PROFIBUS clock cycle and the position controller clock cycle to an integer multiple.

Reaction upon F: OFF1
Acknowl. upon F: IMMEDIATELY

A07580 (F, N) Drive: No Sensor Module with matching component number
Message value: Encoder data set: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: A Sensor Module with the component number specified in p0141 was not found.
Alarm value (r2124, interpret decimal):
Encoder data set involved (index of p0141).

Remedy: Correct parameter p0141.
Reaction upon F: OFF1 (IASC/DCBRAKE, NONE, OFF2, OFF3, STOP1, STOP2)
Acknowl. upon F: IMMEDIATELY (POWER ON)
Reaction upon N: NONE
Acknowl. upon N: NONE

A07581 (F) Encoder 1: Position actual value preprocessing error
Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: An error has occurred during the position actual value preprocessing.
Faults and alarms

List of faults and alarms

Remedy: Check the encoder for the position actual value preprocessing.
See also: p2502 (LR encoder assignment)

Reaction upon F: OFF1 (OFF2, OFF3)
Acknowl. upon F: IMMEDIATELY

A07582 (F) Encoder 2: Position actual value preprocessing error
Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: An error has occurred during the position actual value preprocessing.
Remedy: Check the encoder for the position actual value preprocessing.
See also: p2502 (LR encoder assignment)

Reaction upon F: OFF1 (OFF2, OFF3)
Acknowl. upon F: IMMEDIATELY

A07584 Encoder 1: Position setting value activated
Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: The position actual value is set to the value received via CI: p2515 while BI: p2514 = 1 signal. A possible system deviation cannot be corrected.
Remedy: Not necessary.
The alarm automatically disappears with BI: p2514 = 0 signal.

A07585 Encoder 2: Position setting value activated
Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: The position actual value is set to the value received via CI: p2515 while BI: p2514 = 1 signal. A possible system deviation cannot be corrected.
Remedy: Not necessary.
The alarm automatically disappears with BI: p2514 = 0 signal.

A07587 Encoder 1: Position actual value preprocessing does not have a valid encoder
Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: The following problem has occurred during the position actual value preprocessing.
- an encoder data set has been assigned, however, the encoder data set does not contain any encoder data (p0400 = 0) or invalid data (e.g. p0408 = 0).
Remedy: Check the drive data sets, encoder data sets.
See also: p0187 (Encoder 1 encoder data set number), p0188 (Encoder 2 encoder data set number), p0400 (Encoder type selection), p2502 (LR encoder assignment)

A07588 Encoder 2: Position actual value preprocessing does not have a valid encoder
Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: The following problem has occurred during the position actual value preprocessing.
- an encoder data set has been assigned, however, the encoder data set does not contain any encoder data (p0400 = 0) or invalid data (e.g. p0408 = 0).
Remedy: Check the drive data sets, encoder data sets.
See also: p0187 (Encoder 1 encoder data set number), p0188 (Encoder 2 encoder data set number), p0400 (Encoder type selection), p2502 (LR encoder assignment)

A07590 (F) Encoder 1: Drive Data Set changeover in operation
Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: A Drive Data Set changeover (DDS) with a change of the mechanical relationships and the encoder assignment (p2502) was requested in operation.
Remedy: To changeover the drive data set, initially, exit the "operation" mode.
Reaction upon F: OFF1 (OFF2, OFF3)
Acknowl. upon F: IMMEDIATELY

A07591 (F) Encoder 2: Drive Data Set changeover in operation
Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: A Drive Data Set changeover (DDS) with a change of the mechanical relationships and the encoder assignment (p2502) was requested in operation.
Remedy: To changeover the drive data set, initially, exit the "operation" mode.
Reaction upon F: OFF1 (OFF2, OFF3)
Acknowl. upon F: IMMEDIATELY

A07593 (F, N) Encoder 1: Value range for position actual value exceeded
Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: The value range (-2147483648 ... 2147483647) for the position actual value representation was exceeded. When the overflow occurs, the "referenced" or "adjustment absolute measuring system" status is reset. Fault value (r0949, decimal interpretation):
1: The position actual value (r2521) has exceeded the value range.
2: The encoder position actual value Gn_XIST2 (r0483) or the absolute value after the load gear (r2723) has exceeded the value range.
3: The maximum encoder value times the factor to convert the absolute position (r0483 and/or r2723) from increments to length units (LU) has exceeded the value range for displaying the position actual value.
Remedy: If required, reduce the traversing range or position resolution.
Re alarm value = 3:
- Reducing the position resolution and conversion factor:
  - reduce the length unit (LU) per load revolution for rotary encoders (p2506).
  - increase the fine resolution of absolute position actual values (p0419).
Reaction upon F: OFF1 (OFF2, OFF3)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

A07594 (F, N) Encoder 2: Value range for position actual value exceeded
Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: The value range (-2147483648 ... 2147483647) for the position actual value representation was exceeded. When the overflow occurs, the "referenced" or "adjustment absolute measuring system" status is reset.
Faults and alarms
List of faults and alarms

Fault value (r0949, decimal interpretation):
1: The position actual value (r2521) has exceeded the value range.
2: The encoder position actual value Gn_XIST2 (r0483) or the absolute value after the load gear (r2723) has exceeded the value range.
3: The maximum encoder value times the factor to convert the absolute position (r0483 and/or r2723) from increments to length units (LU) has exceeded the value range for displaying the position actual value.

Remedy:
If required, reduce the traversing range or position resolution.
Re alarm value = 3:
- reduce the length unit (LU) per load revolution for rotary encoders (p2506).
- increase the fine resolution of absolute position actual values (p0419).

Reaction upon F: OFF1 (OFF2, OFF3)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

A07596 (F) Encoder 1: Reference function interrupted
Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause:
An activated reference function (reference mark search or measuring probe evaluation) was interrupted.
- an encoder fault has occurred (Gn_ZSW.15 = 1).
- position actual value was set during an activated reference function.
- simultaneously activate reference mark search and measuring probe evaluation (Bl: p2508 and Bl: p2509 = 1 signal).
- activated reference function (reference mark search or measuring probe evaluation) was de-activated (Bl: p2508 and Bl: p2509 = 0 signal).
Remedy:
- check the causes and resolve.
- reset the control (Bl: p2508 and Bl: p2509 = 0 signal) and activate the requested function.
Reaction upon F: OFF1 (OFF2, OFF3)
Acknowl. upon F: IMMEDIATELY

A07597 (F) Encoder 2: Reference function interrupted
Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause:
An activated reference function (reference mark search or measuring probe evaluation) was interrupted.
- an encoder fault has occurred (Gn_ZSW.15 = 1).
- position actual value was set during an activated reference function.
- simultaneously activate reference mark search and measuring probe evaluation (Bl: p2508 and Bl: p2509 = 1 signal).
- activated reference function (reference mark search or measuring probe evaluation) was de-activated (Bl: p2508 and Bl: p2509 = 0 signal).
Remedy:
- check the causes and resolve.
- reset the control (Bl: p2508 and Bl: p2509 = 0 signal) and activate the requested function.
Reaction upon F: OFF1 (OFF2, OFF3)
Acknowl. upon F: IMMEDIATELY

F07599 (A) Encoder 1: Adjustment not possible
Message value: Drive data set: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF1 (NONE, OFF2, OFF3)
Acknowledge: IMMEDIATELY
Cause:
The maximum encoder value times the factor to convert the absolute position (r0483 and/or r2723) from increments to length units (LU) has exceeded the value range (-2147483648 ... 2147483647) for displaying the position actual value.
Remedy: If the value for the maximum possible absolute position (LU) is greater than 4294967296, then it is not possible to make an adjustment due to an overflow.

For rotary encoders, the maximum possible absolute position (LU) is calculated as follows:

1. Motor encoder without position tracking:
   \[ p_{2506} \times p_{0433} \times p_{2505} / (p_{0432} \times p_{2504}) \]
   \[ p_{2506} \times p_{0433} \times p_{2505} \times p_{0421} / (p_{0432} \times p_{2504}) \] for multiturn encoders

2. Motor encoder with position tracking for measuring gear:
   \[ p_{2506} \times p_{0412} \times p_{2505} / p_{2504} \]

3. Motor encoder with position tracking for load gear:
   \[ p_{2506} \times p_{2721} \times p_{0433} / p_{0432} \]

4. Motor encoder with position tracking for load and measuring gear:
   \[ p_{2506} \times p_{2721} \]

5. Direct encoder without position tracking:
   \[ p_{2506} \times p_{0433} / p_{0432} \]
   \[ p_{2506} \times p_{0433} \times p_{0421} / p_{0432} \] for multiturn encoders

6. Direct encoder with position tracking for measuring gear:
   \[ p_{2506} \times p_{0412} \]

Reaction upon A: NONE

Acknowl. upon A: NONE

F07800

Drive: No power unit present

Message value:
- 

Drive object:
SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

Reaction:
NONE

Acknowledge:
IMMEDIATELY

Cause:
The power unit parameters cannot be read or no parameters are stored in the power unit.
Connection between Control Unit and power unit was interrupted or is defective.

Note:
This fault also occurs if an incorrect topology was selected in the commissioning software and this parameterization is then downloaded to the Control Unit.
See also: r0200 (Power unit code number actual)
## Faults and alarms

### List of faults and alarms

**Remedy:**
- connect the data line to power unit and restart the CU (POWER ON).
- check or replace the CU.
- after correcting the topology, the parameters must be again downloaded using the commissioning software.

### F07801 Drive: Motor overcurrent

| Message value: | - |
| Drive object: | SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN |
| Reaction: | OFF2 (NONE, OFF1, OFF3) |
| Acknowledge: | IMMEDIATELY |
| Cause: | The permissible motor limit current was exceeded. |
| | - effective current limit set too low. |
| | - current controller not correctly set. |
| | - motor was braked with an excessively high stall torque correction factor. |
| | - U/f operation: Up ramp was set too short or the load is too high. |
| | - U/f operation: Short-circuit in the motor cable or ground fault. |
| | - U/f operation: Motor current does not match the current of Motor Module. |
| Note: | Synchronous motor: Limit current = 1.3 x p0323 |
| | Induction motor: Limit current = 1.3 x r0209 |

**Remedy:**
- check the current limits (p0323, p0640).
- check the current controller (p1715, p1717).
- reduce the stall torque correction factor (p0326).
- increase the up ramp (p1318) or reduce the load.
- check the motor and motor cables for short-circuit and ground fault.
- check the Motor Module and motor combination.

### F07802 Drive: Infeed or power unit not ready

| Message value: | - |
| Drive object: | SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN |
| Reaction: | OFF2 (NONE) |
| Acknowledge: | IMMEDIATELY |
| Cause: | After an internal power-on command, the infeed or drive does not signal ready. |
| | - monitoring time is too short. |
| | - DC link voltage is not present. |
| | - associated infeed or drive of the signaling component is defective. |
| | - supply voltage incorrectly set. |

**Remedy:**
- increase the monitoring time (p0857).
- ensure that there is a DC link voltage. Check the DC link busbar. Enable the infeed.
- replace the associated infeed or drive of the signaling component.
- check the line supply voltage setting (p0210).

See also: p0857 (Power unit monitoring time)

### A07805 (N) Drive: Power unit overload I2t

| Message value: | - |
| Drive object: | SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN |
| Reaction: | NONE |
| Acknowledge: | NONE |
| Cause: | Alarm threshold for I2t overload (p0294) of the power unit exceeded. |
| | The response parameterized in p0290 becomes active. |
| | See also: p0290 (Power unit overload response) |

**Remedy:**
- reduce the continuous load.
- adapt the load duty cycle.
- check the assignment of the rated currents of the motor and Motor Module.

**Reaction upon N:** NONE
**Acknowl. upon N:** NONE
F07810 Drive: Power unit EEPROM without rated data
Message value: 
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: IMMEDIATELY
Cause: No rated data are stored in the power unit EEPROM.
See also: r0206 (Rated power unit power), r0207 (Rated power unit current), r0208 (Rated power unit line supply voltage), r0209 (Power unit, maximum current)
Remedy: Replace the power unit or inform Siemens Customer Service.

F07815 Drive: Power unit has been changed
Message value: Parameter: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: IMMEDIATELY
Cause: The code number of the actual power unit does not match the saved number. This only occurs if the comparator in p9906 or p9908 is not at 2 (low) or 3 (minimum).
Fault value (r0949, decimal interpretation):
Number of the incorrect parameter.
See also: r0200 (Power unit code number actual), p0201 (Power unit code number)
Remedy: Connect the original power unit and power up the Control Unit again (POWER ON) or set p0201 to r0200 and exit commissioning with p0010 = 0.
For infeeds, the following applies:
Line reactors or line filters must be used that are specified for the new power unit. A line supply and DC link identification routine (p3410 = 5) must then be carried out. It is not possible to change the power unit without re-commissioning the system if the type of infeed (A_Infeed, B_Infeed, S_Infeed), the type of construction/design (booksize, chassis) or the voltage class differ between the old and new power units.
For inverters, the following applies:
If the new power unit is accepted, then if required, the current limit (p0640) can be reduced by a lower maximum current of the power unit (r0209) (torque limits stay the same).
If only the power unit is changed, but also the motor, then the motor must be re-commissioned (e.g. using p0010 = 1). This is also necessary if motor data is still to be downloaded via DRIVE-CLiQ.
If the comparison stage in p9906 is set to 2, 3, then commissioning can be exited (p0010 = 0) and the fault acknowledged.
See also: r0200 (Power unit code number actual)

A07820 Drive: Temperature sensor not connected
Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: The temperature sensor for monitoring the motor temperature, specified in p0600, is not available.
Alarm value (r2124, interpret decimal):
1: p0601 = 10 (SME), but in p0600 - not evaluated via encoder is selected.
2: p0600 = 10 (BICO), but the signal source (p0603) is not interconnected.
3: p0601 = 11 (BICO), but in p0600 - not evaluated via BICO interconnection is selected (20 or 21).
4: p0601 = 11 (BICO) and p4610-p4613 > 0, but the associated signal source (p0608, p0609) is not interconnected.
5: Component with sensor evaluation not present or has been removed in the meantime.
6: Evaluation via Motor Module not possible (r0192.21).
Remedy: Re alarm value = 1:
- In p0600 set an encoder with temperature sensor.
Re alarm value = 2:
- interconnect p0603 with the temperature signal.
Re alarm value = 3, 4:
- set the available temperature sensor (p0600, p0601).
- set p4610 ... p4613 = 0 (no sensor), or interconnect p0608 or p0609 with an external temperature signal.
Re alarm value = 5:
- connect the component with the temperature sensor. Check the DRIVE-CLiQ connection.
### Faults and alarms

#### List of faults and alarms

Re alarm value = 6:
- update the Motor Module firmware. Connect temperature sensor via encoder.
See also: p0800 (Motor temperature sensor for monitoring), p0801 (Motor temperature sensor type)

<table>
<thead>
<tr>
<th>A07850 (F)</th>
<th>External alarm 1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Message value:</strong></td>
<td>-</td>
</tr>
<tr>
<td><strong>Drive object:</strong></td>
<td>All objects</td>
</tr>
<tr>
<td><strong>Reaction:</strong></td>
<td>NONE</td>
</tr>
<tr>
<td><strong>Acknowledge:</strong></td>
<td>NONE</td>
</tr>
<tr>
<td><strong>Cause:</strong></td>
<td>The BICO signal for &quot;external alarm 1&quot; was triggered. The condition for this external alarm is fulfilled. See also: p2112 (External alarm 1)</td>
</tr>
<tr>
<td><strong>Remedy:</strong></td>
<td>Eliminate the causes of this alarm.</td>
</tr>
<tr>
<td><strong>Reaction upon F:</strong></td>
<td>NONE (IASC/DCBRAKE, OFF1, OFF2, OFF3, STOP1, STOP2)</td>
</tr>
<tr>
<td><strong>Acknowl. upon F:</strong></td>
<td>IMMEDIATELY (POWER ON)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>A07851 (F)</th>
<th>External alarm 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Message value:</strong></td>
<td>-</td>
</tr>
<tr>
<td><strong>Drive object:</strong></td>
<td>All objects</td>
</tr>
<tr>
<td><strong>Reaction:</strong></td>
<td>NONE</td>
</tr>
<tr>
<td><strong>Acknowledge:</strong></td>
<td>NONE</td>
</tr>
<tr>
<td><strong>Cause:</strong></td>
<td>The BICO signal for &quot;external alarm 2&quot; was triggered. The condition for this external alarm is fulfilled. See also: p2116 (External alarm 2)</td>
</tr>
<tr>
<td><strong>Remedy:</strong></td>
<td>Eliminate the causes of this alarm.</td>
</tr>
<tr>
<td><strong>Reaction upon F:</strong></td>
<td>NONE (IASC/DCBRAKE, OFF1, OFF2, OFF3, STOP1, STOP2)</td>
</tr>
<tr>
<td><strong>Acknowl. upon F:</strong></td>
<td>IMMEDIATELY (POWER ON)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>A07852 (F)</th>
<th>External alarm 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Message value:</strong></td>
<td>-</td>
</tr>
<tr>
<td><strong>Drive object:</strong></td>
<td>All objects</td>
</tr>
<tr>
<td><strong>Reaction:</strong></td>
<td>NONE</td>
</tr>
<tr>
<td><strong>Acknowledge:</strong></td>
<td>NONE</td>
</tr>
<tr>
<td><strong>Cause:</strong></td>
<td>The BICO signal for &quot;external alarm 3&quot; was triggered. The condition for this external alarm is fulfilled. See also: p2117 (External alarm 3)</td>
</tr>
<tr>
<td><strong>Remedy:</strong></td>
<td>Eliminate the causes of this alarm.</td>
</tr>
<tr>
<td><strong>Reaction upon F:</strong></td>
<td>NONE (IASC/DCBRAKE, OFF1, OFF2, OFF3, STOP1, STOP2)</td>
</tr>
<tr>
<td><strong>Acknowl. upon F:</strong></td>
<td>IMMEDIATELY (POWER ON)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>F07860 (A)</th>
<th>External fault 1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Message value:</strong></td>
<td>-</td>
</tr>
<tr>
<td><strong>Drive object:</strong></td>
<td>All objects</td>
</tr>
<tr>
<td><strong>Reaction:</strong></td>
<td>OFF2 (IASC/DCBRAKE, NONE, OFF1, OFF3, STOP1, STOP2)</td>
</tr>
<tr>
<td><strong>Acknowledge:</strong></td>
<td>IMMEDIATELY (POWER ON)</td>
</tr>
<tr>
<td><strong>Cause:</strong></td>
<td>The BICO signal &quot;external fault 1&quot; was triggered. See also: p2106 (External fault 1)</td>
</tr>
<tr>
<td><strong>Remedy:</strong></td>
<td>Eliminate the causes of this fault.</td>
</tr>
<tr>
<td><strong>Reaction upon A:</strong></td>
<td>NONE</td>
</tr>
<tr>
<td><strong>Acknowl. upon A:</strong></td>
<td>NONE</td>
</tr>
</tbody>
</table>
### F07861 (A) External fault 2

<table>
<thead>
<tr>
<th>Message value:</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive object:</td>
<td>All objects</td>
</tr>
<tr>
<td>Reaction:</td>
<td>OFF2 (IASC/DCBRAKE, NONE, OFF1, OFF3, STOP1, STOP2)</td>
</tr>
<tr>
<td>Acknowledge:</td>
<td>IMMEDIATELY (POWER ON)</td>
</tr>
<tr>
<td>Cause:</td>
<td>The BICO signal &quot;external fault 2&quot; was triggered. See also: p2107 (External fault 2)</td>
</tr>
<tr>
<td>Remedy:</td>
<td>Eliminate the causes of this fault.</td>
</tr>
<tr>
<td>Reaction upon A:</td>
<td>NONE</td>
</tr>
<tr>
<td>Acknowl. upon A:</td>
<td>NONE</td>
</tr>
</tbody>
</table>

### F07862 (A) External fault 3

<table>
<thead>
<tr>
<th>Message value:</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive object:</td>
<td>All objects</td>
</tr>
<tr>
<td>Reaction:</td>
<td>OFF2 (IASC/DCBRAKE, NONE, OFF1, OFF3, STOP1, STOP2)</td>
</tr>
<tr>
<td>Acknowledge:</td>
<td>IMMEDIATELY (POWER ON)</td>
</tr>
<tr>
<td>Cause:</td>
<td>The BICO signal &quot;external fault 3&quot; was triggered. See also: p2108 (External fault 3)</td>
</tr>
<tr>
<td>Remedy:</td>
<td>Eliminate the causes of this fault.</td>
</tr>
<tr>
<td>Reaction upon A:</td>
<td>NONE</td>
</tr>
<tr>
<td>Acknowl. upon A:</td>
<td>NONE</td>
</tr>
</tbody>
</table>

### F07890 Internal voltage protection / internal armature short-circuit with STO active

<table>
<thead>
<tr>
<th>Message value:</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive object:</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
</tr>
<tr>
<td>Reaction:</td>
<td>OFF2</td>
</tr>
<tr>
<td>Acknowledge:</td>
<td>IMMEDIATELY</td>
</tr>
<tr>
<td>Cause:</td>
<td>The internal armature short-circuit (p1231 = 4) is not possible as Safe Torque Off (STO) is enabled. The pulses cannot be enabled.</td>
</tr>
<tr>
<td>Remedy:</td>
<td>Switch out the internal armature short-circuit (p1231=0) or de-activate Safe Torque Off (p9501 = p9561 = 0). Note: STO: Safe Torque Off / SH: Safe standstill</td>
</tr>
</tbody>
</table>

### F07900 (N, A) Drive: Motor locked/speed controller at its limit

<table>
<thead>
<tr>
<th>Message value:</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive object:</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
</tr>
<tr>
<td>Reaction:</td>
<td>OFF2 (NONE, OFF1, OFF3, STOP1, STOP2)</td>
</tr>
<tr>
<td>Acknowledge:</td>
<td>IMMEDIATELY</td>
</tr>
<tr>
<td>Cause:</td>
<td>Motor has been operating at the torque limit longer than the time specified in p2177 and below the speed threshold in p2175. This signal can also be initiated if the speed actual value is oscillating and the speed controller output repeatedly goes to its limit. See also: p2175 (Motor locked speed threshold), p2177 (Motor locked delay time)</td>
</tr>
<tr>
<td>Remedy:</td>
<td>- check that the motor can rotate freely.</td>
</tr>
<tr>
<td></td>
<td>- check the torque limit: For a positive direction of rotation r1538, for a negative direction of rotation r1539.</td>
</tr>
<tr>
<td></td>
<td>- check the parameter, message &quot;Motor locked&quot; and if required, correct (p2175, p2177).</td>
</tr>
<tr>
<td></td>
<td>- check the inversion of the actual value (p0410).</td>
</tr>
<tr>
<td></td>
<td>- check the motor encoder connection.</td>
</tr>
<tr>
<td></td>
<td>- check the encoder pulse number (p0408).</td>
</tr>
<tr>
<td></td>
<td>- for SERVO with encoderless operation and motors with low power ratings (&lt; 300 W), increase the pulse frequency (p1800).</td>
</tr>
<tr>
<td></td>
<td>- after de-selecting the &quot;Basic positioner&quot; (EPOS) function mode, check the motoring (p1528) and regenerative (p1529) torque limit and modify again.</td>
</tr>
<tr>
<td>Reaction upon N:</td>
<td>NONE</td>
</tr>
<tr>
<td>Acknowl. upon N:</td>
<td>NONE</td>
</tr>
</tbody>
</table>
Faults and alarms

List of faults and alarms

F07901  Drive: Motor overspeed
Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF2 (IASC/DCBRAKE)
Acknowledge: IMMEDIATELY
Cause: The maximum permissible speed was either positively or negatively exceeded.
The maximum permissible positive speed is formed as follows: Minimum (p1082, CI: p1085) + p2162
The maximum permissible negative speed is formed as follows: Maximum (-p1082, CI: 1088) - p2162
Remedy: The following applies for a positive direction of rotation:
- check r1084 and if required, correct p1082, CI:p1085 and p2162.
The following applies for a negative direction of rotation:
- check r1087 and if required, correct p1082, CI:p1088 and p2162.

F07902 (N, A)  Drive: Motor stalled
Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF2 (IASC/DCBRAKE, NONE, OFF1, OFF3, STOP1, STOP2)
Acknowledge: IMMEDIATELY
Cause: For a vector drive the system has identified that the motor has stall for a time longer than is set in p2178.
Fault value (r0949, decimal interpretation):
1: Stall detection using r1408.11 (p1744 or p0492).
2: Stall detection using r1408.12 (p1745).
3: Stall detection using r0056.11 (only for separately excited synchronous motors).
Remedy: For closed-loop speed and torque control with speed encoder, the following applies:
- check the speed signal (interrupted cable, polarity, pulse number, broken encoder shaft).
- check the speed encoder, if another speed encoder was selected using the data set changeover. This must be connected to the same motor that is controlled for the data set changeover.
If there is no fault, then the fault tolerance (p1744 and p0492) can be increased.
For closed-loop speed and torque control without speed encoder, the following applies:
- check whether the drive in the open-loop controlled mode (r1750.0) stalls under load. If yes, then increase the current setpoint using p1610.
- check whether the drive stalls due to the load if the speed setpoint is still zero. If yes, then increase the current setpoint using p1610.
- if the motor excitation (magnetizing) time (r0346) was significantly reduced, then it should be increased again.
- check the current limits (p0640, r0067). If the current limits are too low, then the drive cannot be magnetized.
- check the current controller (p1715, p1717) and the speed adaptation controller (p1764, p1767). If the dynamic response was significantly reduced, then this should be increased again.
- check the speed encoder, if another speed encoder was selected using the data set changeover. This must be connected to the motor that is controlled for the data set changeover.
If there is no fault, then the fault tolerance (p1745) or the delay time (p2178) can be increased.
For separately-excited synchronous motors (closed-loop control with speed encoder), the following applies:
- check the speed signal (interrupted cable, polarity, pulse number).
- ensure the correct motor parameterization (rating plate and equivalent circuit diagram parameters).
- check the excitation equipment and the interface to the closed-loop control.
- encoder the highest possible dynamic response of the closed-loop excitation current control.
- check the speed control for any tendency to oscillate and if resonance effects occur, use a bandstop filter.
- do not exceed the maximum speed (p2162).
If there is no fault, then the delay time can be increased (p2178).
### A07903  Drive: Motor speed deviation

**Message value:** -  
**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
**Reaction:** NONE  
**Acknowledge:** NONE  
**Cause:** The absolute value of the speed difference from the two setpoints (p2151, p2154) and the speed actual value (r2169) exceeds the tolerance threshold (p2163) longer than tolerated (p2164, p2166). The alarm is only enabled for p2149.0 = 1. Possible causes could be:  
- the load torque is greater than the torque setpoint.  
- when accelerating, the torque/current/power limit is reached. If the limits are not sufficient, then it is possible that the drive has been dimensioned too small.  
- for closed-loop torque control, the speed setpoint does not track the speed actual value.  
- for active Vdc controller.  
For U/f control, the overload condition is detected as the Imax controller is active. See also: p2149 (Monitoring configuration)  
**Remedy:**  
- increase p2163 and/or p2166.  
- increase the torque/current/power limits.  
- for closed-loop torque control: The speed setpoint should track the speed actual value.  
- de-activate alarm with p2149.0 = 0.

### A07904 (N)  External armature short-circuit: Contactor feedback signal "Closed" missing

**Message value:** -  
**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
**Reaction:** NONE  
**Acknowledge:** NONE  
**Cause:** When closing, the contactor feedback signal (p1235) did not issue the signal "Closed" (r1239.1 = 1) within the monitoring time (p1236).  
**Remedy:**  
- check that the contactor feedback signal is correctly connected (p1235).  
- check the logic of the contactor feedback signal (r1239.1 = 1: "Closed", r1239.1 = 0: "Open").  
- increase the monitoring time (p1236).  
- if required, set the external armature short-circuit without contactor feedback signal (p1231 = 2).  
**Reaction upon N:** NONE  
**Acknowl. upon N:** NONE

### F07905 (N, A)  External armature short-circuit: Contactor feedback signal "Open" missing

**Message value:** -  
**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
**Reaction:** OFF2 (NONE)  
**Acknowledge:** IMMEDIATELY  
**Cause:** When opening, the contactor feedback signal (p1235) did not issue the signal "Open" (r1239.1 = 0) within the monitoring time (p1236).  
**Remedy:**  
- check that the contactor feedback signal is correctly connected (p1235).  
- check the logic of the contactor feedback signal (r1239.1 = 1: "Closed", r1239.1 = 0: "Open").  
- increase the monitoring time (p1236).  
- if required, set the external armature short-circuit without contactor feedback signal (p1231 = 2).  
**Reaction upon N:** NONE  
**Acknowl. upon N:** NONE  
**Reaction upon A:** NONE  
**Acknowl. upon A:** NONE
F07906  
**Armature short-circuit / internal voltage protection: Parameterization error**

**Message value:** Fault cause: %1, motor data set: %2

**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

**Reaction:** OFF2

**Acknowledge:** IMMEDIATELY

**Cause:** The armature short-circuit is incorrectly parameterized.

Fault value (r0949, decimal interpretation):
- zzzzyyxx: zzzz = fault cause, xx = motor data set
- zzzz = 1: A permanent-magnet synchronous motor has not been selected.
- zzzz = 2: An induction motor has not been selected.
- zzzz = 101: External armature short-circuit: Output (r1239.0) not connected up.
- zzzz = 102: External armature short-circuit with contactor feedback signal: No feedback signal connected (Bi:p1235).
- zzzz = 103: External armature short-circuit without contactor feedback signal: Delay time when opening (p1237) is 0.
- zzzz = 201: Internal voltage protection: The maximum output current of the Motor Module (r0209) is less than 1.8 x motor short-circuit current (r0331).
- zzzz = 202: Internal voltage protection: A Motor Module in booksize or chassis format is not being used.
- zzzz = 203: Internal voltage protection: The motor short-circuit current (p0320) is greater than the maximum motor current (p0323).
- zzzz = 204: Internal voltage protection: The activation (p1231 = 4) is not given for all motor data sets with synchronous motors (p0300 = 2xx, 4xx).

**Remedy:**

For fault value = 1:
- an armature short-circuit / voltage protection is only permissible for permanent-magnetic synchronous motors. The highest position of the motor type in p0300 must either be 2 or 4.
- the contactor for the external armature short-circuit configuration should be controlled using output signal r1239.0. The signal can, e.g. be connected to an output terminal via binector input p0738. Before this fault can be acknowledged, p1231 must be set again.

For fault value = 101:
- if the external armature short-circuit with contactor feedback signal (p1231 = 1) is selected, this feedback signal must be connected to an input terminal (e.g. r722.x) and then connected to Bi: p1235.
- alternatively, the external armature short-circuit without contactor feedback signal (p1231 = 2) can be selected.

For fault value = 103:
- if the external armature short-circuit without contactor feedback signal (p1231 = 2) is selected, then a delay time must be parameterized in p1237. This time must always be greater than the actual contactor opening time, as otherwise the Motor Module would be short-circuited!

For fault value = 201:
- a Motor Module with a higher maximum current or a motor with a lower short-circuit current must be used. The maximum Motor Module current must be higher than 1.8 x short-circuit current of the motor.

For fault value = 202:
- for internal voltage protection, use a Motor Module in booksize or chassis format.

For fault value = 203:
- for internal voltage protection, only use short-circuit-proof motors.

For fault value = 204:
- The internal voltage protection must either be activated for all motor data sets with synchronous motors (p0300 = 2xx, 4xx) (p1231 = 3) or it must be de-activated for all motor data sets (p1231 not equal to 3). This therefore ensures that the protection cannot be accidentally withdrawn as a result of a data set changeover. The fault can only be acknowledged if this condition is fulfilled.

F07907  
**Internal armature short-circuit: Motor terminals are not at zero potential after pulse suppression**

**Message value:**

**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

**Reaction:** NONE

**Acknowledge:** IMMEDIATELY

**Cause:** The function "Internal voltage protection" (p1231 = 3) was activated.

The following must be observed:
- when the internal voltage protection is active, after pulse suppression, all of the motor terminals are at half of the DC link voltage (without an internal voltage protection, the motor terminals are at zero potential)!
- it is only permissible to use motors that are short-circuit-proof (p0320 < p0323).
- the Motor Module must be able to continually conduct 180% short-circuit current (r0331) of the motor (r0289).
- the internal voltage protection cannot be interrupted due to a fault response. If an overcurrent condition occurs during the active, internal voltage protection, then this can destroy the Motor Module and/or the motor.

- if the Motor Module does not support the autonomous, internal voltage protection (r0192.10 = 0), in order to ensure safe, reliable functioning when the line supply fails, an external 24 V power supply (UPS) must be used for the components.

- if the Motor Module does support the autonomous, internal voltage protection (r0192.10 = 1), in order to ensure safe, reliable functioning when the line supply fails, the 24 V power supply for the components must be provided through a Control Supply Module.

- if the internal voltage protection is active, it is not permissible that the motor is driven by the load for a longer period of time (e.g. as a result of loads that move the motor or another coupled motor).

Remedy:

Not necessary.

This a note for the user.

A07908 Internal armature short-circuit active

Message value: -

Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

Reaction: NONE

Acknowledge: NONE

Cause: The Motor Module signals that the motor is short-circuited through the power semiconductors (r1239.5 = 1). The pulses cannot be enabled. The internal armature short-circuit is selected (p1231 = 4);

Remedy: For synchronous motors, the armature short-circuit braking is activated with the external input p1230 = 1 signal.

See also: p1230 (Armature short-circuit / DC braking activation), p1231 (Armature short-circuit / DC braking configuration)

F07909 Internal voltage protection: De-activation only effective after POWER ON

Message value: -

Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

Reaction: NONE

Acknowledge: POWER ON

Cause: The de-activation of the internal voltage protection (p1231 not equal to 3) only becomes effective after POWER ON. The status signal r1239.6 = 1 indicates that the internal voltage protection is ready.

Remedy: Not necessary.

This a note for the user.

A07910 (N) Drive: Motor overtemperature

Message value: %1

Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

Reaction: NONE

Acknowledge: NONE

Cause: KTY:
The motor temperature has exceeded the fault threshold (p0604 or p0616).

PTC:
The response threshold of 1650 Ohm was exceeded.

Alarm value (r2124, interpret decimal):
this is the number of the temperature channel leading to the message.
See also: p0604 (Motor temperature alarm threshold)

Remedy:

- check the motor load.
- check the motor ambient temperature and cooling.
- check PTC or bimetallic NC contact.

Reaction upon N: NONE

Acknow. upon N: NONE
### F07913  Excitation current outside the tolerance range

<table>
<thead>
<tr>
<th>Message value:</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive object:</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
</tr>
<tr>
<td>Reaction:</td>
<td>OFF2</td>
</tr>
<tr>
<td>Acknowledge:</td>
<td>IMMEDIATELY</td>
</tr>
<tr>
<td>Cause:</td>
<td>The difference between the excitation current actual value and setpoint has exceeded the tolerance: ( \text{abs}(r1641 - r1626) &gt; p3201 + p3202 ) ( \text{The cause of this fault is again reset for abs}(1641 - r1626) &lt; p3201. )</td>
</tr>
</tbody>
</table>
| Remedy:           | - check the parameterization (p1640, p3201, p3202).  
- check the interfaces to the excitation equipment (r1626, p1640).  
- check the excitation equipment. |

### F07914  Flux out of tolerance

<table>
<thead>
<tr>
<th>Message value:</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive object:</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
</tr>
<tr>
<td>Reaction:</td>
<td>OFF2</td>
</tr>
<tr>
<td>Acknowledge:</td>
<td>IMMEDIATELY</td>
</tr>
<tr>
<td>Cause:</td>
<td>The difference between the flux actual value and setpoint has exceeded the tolerance: ( \text{abs}(r0084 - r1598) &gt; p3204 + p3205 ) ( \text{The cause of this fault is again reset for abs}(0084 - r1598) &lt; p3204. ) ( \text{The fault is only issued after the delay time in p3206 has expired.} )</td>
</tr>
</tbody>
</table>
| Remedy:           | - check the parameterization (p3204, p3205).  
- check the interfaces to the excitation equipment (r1626, p1640).  
- check the excitation equipment.  
- check the control for oscillation and take the appropriate counter measures (e.g. optimize the speed control loop, parameterize a bandstop filter). |

### A07918 (N)  Three-phase setpoint generator operation selected/active

<table>
<thead>
<tr>
<th>Message value:</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive object:</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
</tr>
<tr>
<td>Reaction:</td>
<td>NONE</td>
</tr>
<tr>
<td>Acknowledge:</td>
<td>NONE</td>
</tr>
<tr>
<td>Cause:</td>
<td>Only for separately excited synchronous motors (p0300 = 5): ( \text{The actual open-loop/closed-loop control mode is I/f control (open-loop) with a fixed current (p1300 = 18)} ) ( \text{The speed is entered via the setpoint channel and the current setpoint is given by the minimum current (p1620). It must be ensured that in this mode, the control dynamic performance is very limited. This is the reason that longer ramp-up times should be set for the setpoint speed than for normal operation.} )</td>
</tr>
<tr>
<td>Remedy:</td>
<td>Select another open-loop/closed-loop control mode ( \text{See also: p1300 (Open-loop/closed-loop control operating mode)} )</td>
</tr>
<tr>
<td>Reaction upon N:</td>
<td>NONE</td>
</tr>
<tr>
<td>Acknowl. upon N:</td>
<td>NONE</td>
</tr>
</tbody>
</table>

### A07920  Drive: Torque/speed too low

<table>
<thead>
<tr>
<th>Message value:</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive object:</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
</tr>
<tr>
<td>Reaction:</td>
<td>NONE</td>
</tr>
<tr>
<td>Acknowledge:</td>
<td>NONE</td>
</tr>
<tr>
<td>Cause:</td>
<td>The torque deviates from the torque/speed envelope characteristic (too low). ( \text{See also: p2181 (Load monitoring response)} )</td>
</tr>
</tbody>
</table>
| Remedy:           | - check the connection between the motor and load.  
- adapt the parameterization corresponding to the load. |
A07921 Drive: Torque/speed too high
- Message value: -
- Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
- Reaction: NONE
- Acknowledge: NONE
- Cause: The torque deviates from the torque/speed envelope characteristic (too high).
- Remedy: - check the connection between the motor and load.
- adapt the parameterization corresponding to the load.

A07922 Drive: Torque/speed out of tolerance
- Message value: -
- Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
- Reaction: NONE
- Acknowledge: NONE
- Cause: The torque deviates from the torque/speed envelope characteristic.
- Remedy: - check the connection between the motor and load.
- adapt the parameterization corresponding to the load.

F07923 Drive: Torque/speed too low
- Message value: -
- Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
- Reaction: OFF1 (NONE, OFF2, OFF3)
- Acknowledge: IMMEDIATELY
- Cause: The torque deviates from the torque/speed envelope characteristic (too low).
- Remedy: - check the connection between the motor and load.
- adapt the parameterization corresponding to the load.

F07924 Drive: Torque/speed too high
- Message value: -
- Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
- Reaction: OFF1 (NONE, OFF2, OFF3)
- Acknowledge: IMMEDIATELY
- Cause: The torque deviates from the torque/speed envelope characteristic (too high).
- Remedy: - check the connection between the motor and load.
- adapt the parameterization corresponding to the load.

F07925 Drive: Torque/speed out of tolerance
- Message value: -
- Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
- Reaction: OFF1 (NONE, OFF2, OFF3)
- Acknowledge: IMMEDIATELY
- Cause: The torque deviates from the torque/speed envelope characteristic.
- Remedy: - check the connection between the motor and load.
- adapt the parameterization corresponding to the load.

A07926 Drive: Envelope curve, parameter invalid
- Message value: Parameter: %1
- Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
- Reaction: NONE
- Acknowledge: NONE
- Cause: Invalid parameter values were entered for the envelope characteristic of the load monitoring.
The following rules apply for the speed thresholds:
p2182 < p2183 < p2184
The following rules apply for the torque thresholds:
p2185 > p2186
Faults and alarms

List of faults and alarms

<table>
<thead>
<tr>
<th>Fault Code</th>
<th>Description</th>
<th>Message Value</th>
<th>Drive object</th>
<th>Reaction</th>
<th>Acknowledge</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>A07927</td>
<td>DC braking active</td>
<td>-</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>OFF2</td>
<td>IMMEDIATELY</td>
<td>The motor is braked with DC current. DC braking is active.</td>
<td>The alarm automatically disappears once DC braking has been executed.</td>
</tr>
<tr>
<td>F07928</td>
<td>Internal voltage protection initiated</td>
<td>-</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>OFF1</td>
<td>IMMEDIATELY</td>
<td>The Motor Module signals that the motor is short-circuited through the power semiconductors (r1239.5 = 1). The pulses cannot be enabled. The internal voltage protection is selected (p1231 = 3).</td>
<td>If the Motor Module supports the autonomous internal voltage protection (r0192.10 = 1), then the Motor Module automatically decides - using the DC link voltage - as to whether the armature short-circuit should be activated. The armature short-circuit is activated and response OFF2 is initiated if the DC link voltage exceeds 800 V. If the DC link voltage falls below 450 V, then the armature short-circuit is withdrawn. If the motor is still in a critical speed range, the armature short-circuit is re-activated once the DC link voltage exceeds the threshold of 800 V. If the autonomous (independent) internal voltage protection is active (r1239.5 = 1) and the line supply returns (450 V &lt; DC link voltage &lt; 800 V), the armature short-circuit is withdrawn after 3 minutes.</td>
</tr>
<tr>
<td>F07930</td>
<td>Drive: Brake control error</td>
<td>%1</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>IMMEDIATELY</td>
<td>OFF1, OFF2, OFF3</td>
<td>The Control Unit has detected a brake control error. Fault value (r0949, decimal interpretation): 10, 11: Fault in &quot;open holding brake&quot; operation. No brake connected or wire breakage (check whether brake releases for p1278 = 1). - Ground fault in brake cable. 20: Fault in &quot;brake open&quot; state. - Short-circuit in brake winding. 30, 31: Fault in &quot;close holding brake&quot; operation. No brake connected or wire breakage (check whether brake releases for p1278 = 1). - Short-circuit in brake winding. 40: Fault in &quot;brake closed&quot; state. 50: Fault in the brake control circuit of the Control Unit or communication fault between Control Unit and Motor Module (brake control diagnostics). 80: When using the Safe Brake Adaptor (SBA), a fault has occurred in the brake control of the Control Unit.</td>
<td></td>
</tr>
</tbody>
</table>
Note:
The following causes may apply to fault values:
- motor cable is not shielded correctly.
- defect in control circuit of the Motor Module.
See also: p1278 (Brake control, diagnostics evaluation)

Remedy:
- check the motor holding brake connection.
- check the function of the motor holding brake.
- check whether there is a DRIVE-CLiQ communication error between the Control Unit and the Motor Module involved and, if required, carry out a diagnostics routine for the faults identified.
- check that the electrical cabinet design and cable routing are in compliance with EMC regulations (e.g. shield of the motor cable and brake conductors are connected with the shield connecting plate and the motor connectors are tightly screwed to the housing).
- replace the Motor Module involved.
Operation with Safe Brake Module:
- check the Safe Brake Modules connection.
- replace the Safe Brake Module.
Operation with Safe Brake Module (SBA):
- check the SBA connection and if required, replace the SBA.
See also: p1215 (Motor holding brake configuration), p1278 (Brake control, diagnostics evaluation)

A07931 (F, N) Brake does not open
Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: This alarm is output for r1229.4 = 1.
See also: p1216 (Motor holding brake, opening time), r1229 (Motor holding brake status word)
Remedy:
- check the functionality of the motor holding brake.
- check the feedback signal (p1223).

Reaction upon F: NONE (OFF1, OFF2, OFF3)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

A07932 Brake does not close
Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: This alarm is output for r1229.5 = 1.
For r1229.5 = 1, OFF1/OFF3 are suppressed to prevent the drive accelerating by a load that drives the motor - whereby OFF2 remains effective.
See also: p1217 (Motor holding brake closing time), r1229 (Motor holding brake status word)
Remedy:
- check the functionality of the motor holding brake.
- check the feedback signal (p1222).

F07934 (N) Drive: S120 Combi motor holding brake configuration
Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE (OFF1, OFF2, OFF3)
Acknowledge: IMMEDIATELY (POWER ON)
Cause: A connected motor holding brake has been detected with an S120 Combi. However, this brake has not been assigned to just one Combi feed drive and, therefore, brake control is not configured (correctly). It is also not permitted to assign the brake to the spindle.
Fault value (r0949, decimal interpretation):
0: No motor holding brake is assigned (p1215 = 0 or 3 on all S120 Combi feed drives).
1: More than one motor holding brake has been assigned (p1215 = 1 or 2 on more than one S120 Combi feed drive)
- or there is more than one DRIVE-CLiQ motor with motor holding brake.
Faults and alarms

List of faults and alarms

2: Brake was accidentally assigned to the spindle (p1215 = 1); this is not permitted.
3: An attempt was made to enable the function "Safe brake control" (SBC, p9602 = p9802 = 1) for the spindle. This is not permitted.

Remedy: Check whether the motor holding brake has been assigned to one S120 Combi feed drive exclusively (p1215 = 1 or 2) and not the spindle.
The fault will only be withdrawn once the motor holding brake has been assigned to just one of the S120 Combi feed drives and not the spindle (p1215 = 1 or 2 for this one drive). From this point, the motor holding brake will be controlled by this drive.
See also: p1215 (Motor holding brake configuration)

Reaction upon N: NONE
Acknowl. upon N: NONE

F07935 (N) Drv: Motor holding brake detected
Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE (OFF1, OFF2, OFF3)
Acknowledge: IMMEDIATELY
Cause: A motor holding brake was detected where the brake control has not been configured (p1215 = 0).
Fault value (r0949, decimal interpretation):
0:
The brake control configuration was set to "motor holding brake the same as sequence control" (p1215 = 1) (only when commissioning for the first time).
1:
The brake control configuration was left at "No motor holding brake available" (p1215 = 0).
Remedy: For fault value = 0:
- No remedy required.
For fault value = 1:
- If required change the motor holding brake configuration (p1215 = 1, 2).
- If this fault value unexpectedly occurs, then the motor connections should be checked in order to rule out that they have been interchanged.
See also: p1215 (Motor holding brake configuration)

Reaction upon N: NONE
Acknowl. upon N: NONE

F07950 (A) Drive: Incorrect motor parameter
Message value: Parameter: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: IMMEDIATELY
Cause:
- the motor parameters were incorrectly entered while commissioning (e.g. p0300 = 0, no motor)
- The braking resistor (p6811) has still not been parameterized - commissioning cannot be completed.
Fault value (r0949, decimal interpretation):
Parameter number involved.
The following motor parameters can be incorrect for fault value 307:
p0304, p0305, p0307, p0308, p0309
See also: p0300, p0301, p0304, p0305, p0307, p0308, p0309, p0310, p0311, p0314, p0316, p0320, p0322, p0323
Remedy: Compare the motor data with the rating plate data and if required, correct.
See also: p0300, p0301, p0304, p0305, p0307, p0308, p0309, p0310, p0311, p0314, p0316, p0320, p0322, p0323
Reaction upon A: NONE
Acknowl. upon A: NONE

F07955 Drive: Motor has been changed
Message value: Parameter: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: IMMEDIATELY
Cause: The code number of the actual motor with DRIVE-CLiQ does not match the saved number.
Fault value (r0949, decimal interpretation):
Number of the incorrect parameter.
See also: p0301 (Motor code number selection), r0302 (Motor code number of motor with DRIVE-CLiQ)

Remedy:
Connect the original motor, power up the Control Unit again (POWER ON) and exit quick commissioning with p0010 = 0.
Or set p0300 = 10000 (load the parameters from the motor with DRIVE-CLiQ) and re-commission.
Quick commissioning (p0010 = 1) is automatically exited with p3900 > 0.
If quick commissioning was exited with p0010 = 0, then an automatic controller calculation (p0340 = 1) is not carried out.

F07956 (A) Drive: Motor code does not match the list (catalog) motor
Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: IMMEDIATELY
Cause: The motor code of the connected motor with DRIVE-CLiQ does not match the possible list motor types (see selection in p0300).
The connected motor with DRIVE-CLiQ might not be supported by this firmware version.
Fault value (r0949, decimal interpretation):
Motor code of the connected motor with DRIVE-CLiQ.
Note: The first three digits of the motor code generally correspond to the list motor type.
Remedy:
Use a motor with DRIVE-CLiQ and the matching motor code.

A07965 (N) Drive: Save required
Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: The angular commutation offset (p0431) was re-defined and has still not been saved.
In order to permanently accept the new value, it must be saved in a non-volatile fashion (p0971, p0977).
See also: p0431 (Angular commutation offset), p1990 (Encoder adjustment, determine angular commutation offset)
Remedy: Not necessary.
This alarm automatically disappears after the data has been saved.
See also: p0971 (Save drive object parameters), p0977 (Save all parameters)

F07966 (A) Drive: Check the commutation angle
Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF2 (NONE)
Acknowledge: IMMEDIATELY
Cause: The speed actual value was inverted and the associated angular commutation offset is not equal to zero and is therefore possibly incorrect.
Remedy: Angular commutation offset after the actual value inversion or determine it again (p1990=1).

A07971 (N) Drive: Angular commutation offset determination activated
Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: The automatic determination of the angular commutation offset (encoder adjustment) is activated (p1990 = 1).
The automatic determination is carried out at the next power-on command.
For SERVO and fault F07414 present, the following applies:

The determination of the angular commutation offset is automatically activated (p1990 = 1), if a pole position identification technique is set in p1980.

See also: p1990 (Encoder adjustment, determine angular commutation offset)

Remedy:
Not necessary.
The alarm automatically disappears after determination or for the setting p1990 = 0.

Reaction upon N: NONE
Acknowl. upon N: NONE

A07980

Drive: Rotating measurement activated

Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE

Cause:
The rotating measurement is activated. For the rotating measurement, the motor can accelerate up to the maximum speed and with maximum torque. Only the parameterized current limit (p0640) and the maximum speed (p1082) are effective. The behavior of the motor can be influenced using the direction inhibit (p1959.14, p1959.15) and the ramp-up/ramp-down time (p1958). The rotating measurement is carried out at the next power-on command.

See also: p1960 (Rotating measurement selection)

Remedy:
Not necessary.
The alarm automatically disappears after the rotating measurement has been successfully completed or for the setting p1960 = 0.

Note:
If a POWER ON or a warm restart is performed with motor data identification selected, the motor data identification request will be lost. If motor data identification is required, it will need to be selected again manually following ramp-up.

F07990

Drive: Incorrect motor data identification

Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF2 (NONE, OFF1)
Acknowledge: IMMEDIATELY

Cause:
A fault has occurred during the identification routine.

Fault value (r0949, decimal interpretation):
1: Current limit value reached.
2: Identified stator resistance lies outside the expected range 0.1 ... 100% of Zn.
3: Identified rotor resistance lies outside the expected range 0.1 ... 100% of Zn.
4: Identified stator reactance lies outside the expected range 50 ... 500% of Zn.
5: Identified magnetizing reactance lies outside the expected range 50 ... 500% of Zn.
6: Identified rotor time constant lies outside the expected range 10 ms ... 5 s.
7: Identified total leakage reactance lies outside the expected range 4 ... 50% of Zn.
8: Identified stator leakage reactance lies outside the expected range 2 ... 50% of Zn.
9: Identified rotor leakage reactance lies outside the expected range 2 ... 50% of Zn.
10: Data set changeover during motor data identification.
11: Motor shaft rotates.
20: Identified threshold voltage of the semiconductor devices lies outside the expected range 0 ... 10 V.
30: Current controller in voltage limiting.
40: At least one identification contains errors. The identified parameters are not saved to prevent inconsistencies.
50: With the selected current controller sampling rate, the pulse frequency cannot be implemented.

Note:
Percentage values are referred to the rated motor impedance:

\[ Z_n = \frac{V_{mot,nom}}{\sqrt{3}} / I_{mot,nom} \]

101: Voltage amplitude even at 30% maximum current amplitude is too low to measure the inductance.
102, 104: Voltage limiting while measuring the inductance.
103: Maximum frequency exceeded during the rotating inductance measurement.
110: Motor not finely synchronized before the rotating measurement.
111: The zero mark is not received within 2 revolutions.
112: Fine synchronization is not realized within 8 seconds after the zero mark has been passed.
113: The power, torque or current limit is zero.
115: U/f control is active.
120: Error when evaluating the magnetizing inductance.
125: Cable resistance greater than the total resistance.
126: Series inductance greater than the total leakage inductance.
127: Identified leakage inductance negative.
128: Identified stator resistance negative.
129: Identified rotor resistance negative.
130: Drive data set changeover during the motor data identification routine.
140: The setpoint channel inhibits both directions.
160: Accelerating when determining kT, moment of inertia or reluctance torque too short or the accelerating time is too long.
173: Internal problem.
180: Identification speed (maximum speed, rated speed, 0.9 x p0348) less than p1755.
190: Speed setpoint not equal to zero.
191: An actual speed of zero is not reached.
192: Speed setpoint not reached.
193: Inadmissible motion of the motor when identifying the voltage emulation error.
194: Supplementary torque (r1515) not equal to zero.
195: Closed-loop torque control active.
200, 201: Not possible to identify the voltage emulation error characteristic of the drive converter (p1952, p1953).

Remedy:
For fault value = 0:
- check whether the motor is correctly connected. Observe configuration (star-delta).
Re fault value = 1 ... 40:
- check whether motor data have been correctly entered in p0300, p0304 ... p0311.
- is there an appropriate relationship between the motor power rating and that of the Motor Module? The ratio of the Motor Module to the rated motor current should not be less than 0.5 and not be greater than 4.
- check configuration (star-delta).
For fault value = 2:
- for parallel circuits, check the motor winding system in p7003. If, for power units connected in parallel, a motor is specified with a single-winding system (p7003 = 0), although a multi-winding system is being used, then a large proportion of the stator resistance is interpreted as feeder cable resistance and entered in p0352.
Re fault value = 4, 7:
- check whether inductances are correctly entered in p0233 and p0353.
- check whether motor has been correctly connected (star-delta).
For fault value = 50:
- reduce the current controller sampling rate.
For fault value = 101:
- increase current limit (p0640) or torque limit (p1520, p1521).
- check current controller gain (p1715).
- reduce current controller sampling time (p0115).
It may be impossible to completely identify the L characteristic, as required current amplitude is too high.
Re fault value = 102, 104:
- reduce current limit (p0640).
- check current controller P gain.
For fault value = 103:
- increase external moment of inertia (if possible).
- reduce current controller sampling time (p0115).
For fault value = 110:
- before rotating measurement, traverse motor over zero mark.
For fault value = 111:
- it is possible that encoder does not have zero mark. Correct setting in p0404.15.
- encoder pulse number was incorrectly entered. Correct setting in p0408.
- if zero mark signal is defective, replace encoder.
For fault value = 112:
- upgrade encoder software.
For fault value = 113:
- check the limits (p0640, p1520, p1521, p1530, p1531), correct the zero values.
For fault value = 115:
- de-select U/f control (p1317 = 0).
Faults and alarms

List of faults and alarms

For fault value = 120:
- check current controller P gain (p1715) and if required, reduce.
- increase the pulse frequency (p1800).

For fault value = 125:
- reduce cable resistance (p0352).

For fault value = 126:
- reduce series inductance (p0353).

Re fault = 127, 128, 129:
- it is possible that current controller is oscillating. Reduce p1715 before next measurement.

For fault value = 130:
- do not initiate a drive data set changeover during motor ident. routine.

For fault value = 140:
- before the measurement, enable at least one direction (p1110 = 0 or p1111 = 0 or p1959.14 = 1 or p1959.15 = 1).

For fault value = 160:
- extend accelerating time when determining kT, moment of inertia and reluctance torque, e.g. by increasing max. speed (p1082), increasing moment of inertia or reducing max. current (p0640).
- in encoderless operation with load moment of inertia, parameterize the load moment of inertia (p1498).
- reduce the ramp-up time (p1958).
- increase speed controller P-gain (p1460).
- suppress meas. (p1959).

For fault value = 173:

For fault value = 180:
- increase max. speed (p1082).
- reduce p1755.

For fault value = 190:
- set speed setpoint to zero.

For fault value = 191:
- do not start motor data ident. routine while motor is still rotating.

For fault value = 192:
- check closed-loop speed control (motor rotor may be locked or closed-loop speed control is not functioning).
- for p1215 = 1, 3 (brake the same as the sequence control) check the control sense (p0410.0).
- ensure that enable signals are present during measurement.
- remove any pulling loads from motor.
- increase max. current (p0640).
- reduce max. speed (p1082).
- suppress meas. (p1959).

For fault value = 193:
- the motor has moved through more than 5 ° electrical (r0093). Lock motor rotor at one of these pole position angles (r0093): 90 °, 210 ° or 330 ° (+/- 5 °) and then start identification.

For fault value = 194:
- switch out all supplementary torques (e.g. Cl: p1511).
- for hanging/suspended axes. Lock motor rotor at one of these pole position angles (r0093): 90 °, 210 ° or 330 ° (+/- 1 °) and then start identification.

For fault value = 195:
- de-select closed-loop torque control (p1300 = 21 or 20, or set the signal source in p1501 to a 0 signal).

Re fault value = 200, 201:
- set pulse frequency to 0.5 x current controller frequency (e.g. 4 kHz for a current controller clock cycle of 125 us).
- reduce cable length between Motor Module and motor.
- read-out measured values (r1950, r1951) and therefore determine suitable values for p1952, p1953 according to your own estimation.

A07991 (N) Drive: Motor data identification activated

<table>
<thead>
<tr>
<th>Message value:</th>
<th>Drive: Motor data identification activated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive object:</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
</tr>
<tr>
<td>Reaction:</td>
<td>NONE</td>
</tr>
<tr>
<td>Acknowledge:</td>
<td>NONE</td>
</tr>
</tbody>
</table>
| Cause: | The motor data ident. routine is activated.

The motor data identification routine is carried out at the next power-on command.
See also: p1910 (Motor data identification routine, stationary (standstill)), p1960 (Rotating measurement selection)
Remedy: Not necessary. The alarm automatically disappears after the motor data identification routine has been successfully completed or for the setting p1910 = 0 or p1960 = 0.

If a POWER ON or a warm restart is performed with motor data identification selected, the motor data identification request will be lost. If motor data identification is required, it will need to be selected again manually following ramp-up.

Reaction upon N: NONE
Acknowl. upon N: NONE

F07993 Drive: Incorrect direction of rotation of the field or encoder actual value inversion

Message value: 
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF2 (NONE)
Acknowledge: IMMEDIATELY
Cause: Either the direction of the rotating field or the encoder actual value has an incorrect sign. The motor data identification automatically changed the actual value inversion (p0410) in order to correct the control sense. This can result in a direction of rotation change.

Note: To acknowledge this fault, the correctness of the direction of rotation must first be acknowledged with p1910 = -2.

Remedy: Check the direction of rotation (also for the position controller, if one is being used).
If the direction of rotation is correct, the following applies: No additional measures are required (except set p1910 = -2 and acknowledge fault).
If the direction of rotation is incorrect, the following applies: To change the direction of rotation, two phases must be interchanged and the motor identification routine must be repeated.

F07995 Drive: Pole position identification not successful

Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF2
Acknowledge: IMMEDIATELY
Cause: The pole position identification routine was unsuccessful.

Fault value (r0949, decimal interpretation):
1: No current is established.
2: The starting current is not zero.
3: The selected max. distance was exceeded (p1981).
4x: The measuring signal does not permit a clear evaluation.
5: The max. current was exceeded during the measurement.
6: The current measurement must be re-calibrated.
7x: The Sensor Module does not support the pole position identification routine.
8: The pole position identification routine current required is greater than the max. current.
9: The set pole position identification routine current is zero.
10: Data set changeover during the pole position identification.
11: The encoder adjustment to determine the commutation angle (p1990 = 1) and the encoder without zero mark is not finely synchronized or does not have any valid data.
100: Motion-based pole position identification, 1st and 2nd measurement different. Motor locked or current (p1993) too low.
101: Motion-based position position identification, insufficient motion, motor locked or current (p1993) too low.
102: Motion-based pole position identification, brake is being used and is closed. The motion-based position position identification in conjunction with the brake is not permitted.
103: Motion-based pole position identification without encoder.
104: Motion-based pole position identification, speed actual value not zero after stabilizing time.
200: Elasticity-based pole position identification, internal error in the arctan calculation ( 0/0 ).
201: Elasticity-based pole position identification, too few measuring points that can be evaluated.
202: Elasticity-based pole position identification, outliers in the measurement series.
203: Elasticity-based pole position identification, maximum rotation without current.
204: Elasticity-based pole position identification, no positive edge found.
205: Elasticity-based pole position identification, the result of the Fourier transformation differs by more than 480 ° electrical / p3093 from the rough estimate.
206: Elasticity-based pole position identification, plausibility test unsuccessful.
207: Elasticity-based pole position identification, no negative measured value found. It is possible that all measured values are identical. The expected deflection was not able to be reached, either because the expectation is too high or not enough current was able to be established.

208: Elasticity-based pole position identification, measuring current is 0.

209: Elasticity-based pole position identification, the selected max. distance was exceeded (p3095).

210: Elasticity-based pole position identification without encoder.

250 ... 260: Elasticity-based pole position identification, more than 3 attempts have been made and fault value 200 ... 210 output.

Example:

Fault value = 253 → more than 3 attempts have been made and fault value 203 output.

Remedy:

For fault value = 1:
- check the motor connection and DC link voltage.
- for the following parameters, set practical values that are not zero (p0325, p0329).

Re fault value = 1, 2:
- in the case of a large computing time load (e.g., 6 drives with Safety Integrated), set the computing dead time of the current controller to late transfers (p0117 = 3).

For fault value = 3:
- increase the max. distance (p1981).
- reduce the currents for the pole position identification routine (p0325, p0329).
- stop the motor in order to carry out the pole position identification routine.

For fault value = 5:
- reduce the currents for the pole position identification routine (p0325, p0329).

For fault value = 6:
- re-calibrate the Motor Module.

For fault value = 8:
- reduce the currents for the pole position identification routine (p0329, p0325, p1993).
- the power unit cannot provide the necessary pole position identification routine current (p0209 < p0329, p0325, p1993), replace the power unit with a power unit with a higher max. current.

For fault value = 9:
- enter a value not equal to zero in the pole position identification routine current (p0329, p0325, p1993).

For fault value = 10:
- do not initiate a data set changeover during the pole position identification.

For fault value = 11:
- for incremental encoders without commutation with zero mark (p0404.15 = 0), it does not make sense to adjust the encoder to determine the commutation angle (p1990 = 1). In this case, the function should be de-selected (p1990 = 0) or, for an encoder with suitable zero mark, commutation with zero mark should be selected (p0404.15 = 1).
- for absolute encoders, only adjust the encoder to determine the commutation angle (p1990 = 1) if the encoder supplies commutation information and is finely synchronized (p1992.8 = 1 and p1992.10 = 1). The encoder is possibly parked, de-activated (p0145), not ready for operation or signals a fault condition.
- de-select the encoder adjustment to determine the commutation angle (set p1990 to 0).

Re fault value = 40 ... 49:
- increase the currents for the pole position identification routine (p0325, p0329).
- stop the motor in order to carry out the pole position identification routine.
- select another technique for pole position identification routine (p1980).
- use another motor, absolute encoder or Hall sensors.

Re fault value = 70 ... 79:
- upgrade the software in the Sensor Module.

Re fault value = 100, 101:
- check and ensure that the motor is free to move.
- increase the current for motion-based pole position identification (p1993).

For fault value = 102:
- If the motor is to be operated with a brake: Select a different technique to identify the pole position (p1980).
- If the motor can be operated without a brake: Open the brake (p1215 = 2).

For fault value = 103:
- the motion-based pole position identification can only be carried out using an encoder. Connect an encoder or select another technique for pole position identification routine (p1980).

For fault value = 104:
- pole position identification, increase the smoothing time, motion-based (p1997).
- pole position identification, increase the rise time, motion-based (p1994).
- pole position identification, check the gain, motion-based (p1995).
- pole position identification, check the integral time, motion-based (p1996).
- for motor encoders with track A/B sq-wave (p0404.3 = 1) and flank time measurement (p0430.20 = 0), disable the integral time (p1996 = 0).
For fault value = 200:
- check parameter setting (p3090 ... p3096).

For fault value = 201:
- check parameter setting (p3090 ... p3096).
- reduce p3094.

For fault value = 202:
- check parameter setting (p3090 ... p3096).
- fault has occurred during the identification. Repeat the measurement.
- check the brake or brake control.

For fault value = 203:
- check the brake or brake control.
- check the measuring current (p3096).
- increase p3094.

For fault value = 204:
- check parameter setting (p3090 ... p3096).

For fault value = 205:
- check parameter setting (p3090 ... p3096).

For fault value = 206:
- check parameter setting (p3090 ... p3096).
- fault has occurred during the identification. Repeat the measurement.
- check the brake or brake control.

For fault value = 207:
- reduce the expected deflection (p3094).
- increase the measuring current (p3096).

For fault value = 208:
- set the measuring current (p3096).

For fault value = 209:
- check parameter setting p3095.
- check the brake or brake control.

For fault value = 210:
- the elasticity-based pole position identification can only be carried out using an encoder. Connect an encoder or select another technique for pole position identification routine (p1980).

For fault value = 250 ... 260:
- check parameter setting (p3090 ... p3096, p1980).

F07996 Drive: Pole position identification routine not carried out

Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: ENCODER (OFF2)
Acknowledge: IMMEDIATELY
Cause: In operation, the operating mode that requires a pole position identification was changed over, which is not possible in this state.
- the drive was changed over, flying, from encoderless operation to operation with encoder without having previously carried out a pole position identification for the encoder. p1404 is then at a value between zero and the max. speed and the pulses in the speed range above p1404 were enabled without a pole position ident. routine having been previously carried out in operation with encoder.
- in operation, an EDS changeover was made to an encoder where it is necessary to carry out a pole position identification. However, this has still not been carried out (p1982 = 1 or 2 and p1992.7 = 0).

Remedy:
- for a flying changeover between operation with and without encoder with pole position identification after POWER ON or commissioning (p0010 not equal to zero) enable the pulses once at zero speed. This means that the pole position identification routine is carried out and the result is available for operation.
- carry out the EDS changeover with the pulses inhibited, or, before the changeover, carry out a pole position identification using this data set.

A07999 Drive: Motor data identification cannot be activated

Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: Closed-loop control is enabled on a SERVO drive object type. To select motor data identification, pulses must be suppressed for all SERVO drive objects.
### Faults and alarms

#### List of faults and alarms

<table>
<thead>
<tr>
<th>Fault Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>F08510 (A)</td>
<td>COMM BOARD: Send configuration data invalid</td>
</tr>
<tr>
<td>A08526 (F)</td>
<td>PROFINET: No cyclic connection</td>
</tr>
<tr>
<td>A08565</td>
<td>CBE20: Consistency error affecting adjustable parameters</td>
</tr>
<tr>
<td>F08700 (A)</td>
<td>CAN: Communications error</td>
</tr>
</tbody>
</table>

**Fault value (r0949, decimal interpretation):**

Drive object with enabled closed-loop control.

**Remedy:**

Withdraw the pulse enable on all drives and re-activate the motor data identification.

**F08510 (A) COMM BOARD: Send configuration data invalid**

**Message value:** %1

**Drive object:** CU_S110-CAN, CU_S110-DP, CU_S110-PN

**Reaction:** NONE

**Acknowledge:** IMMEDIATELY

**Cause:**

COMM BOARD did not accept the send-configuration data.

Fault value (r0949, decimal interpretation):

Return value of the send-configuration data check.

**Remedy:**

Check the send configuration data.

**A08526 (F) PROFINET: No cyclic connection**

**Message value:** -

**Drive object:** CU_S110-CAN, CU_S110-DP, CU_S110-PN

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:**

There is no connection to a PROFINET controller.

**Remedy:**

Establish the cyclic connection and activate the controller with cyclic operation.

Check the parameters "Name of Station" and "IP of Station" (r61000, r61001).

**A08565 CBE20: Consistency error affecting adjustable parameters**

**Message value:** -

**Drive object:** CU_S110-CAN, CU_S110-DP, CU_S110-PN

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:**

A consistency error was detected when activating the configuration (p8925 = 1) for the PROFINET interface.

The currently set configuration has not been activated.

Possible causes:

- IP address, subnet mask or default gateway is not correct
- IP address or station name used twice in the network
- station name contains invalid characters, etc.

See also: p8920 (PN Name of Station), p8921 (PN IP address of station), p8922 (PN Default Gateway of Station), p8923 (PN Subnet Mask of Station)

**Remedy:**

Check the required interface configuration (p8920 and following), correct if necessary, and activate (p8925 = 1).

See also: p8925 (PN interface configuration)

**F08700 (A) CAN: Communications error**

**Message value:** %1

**Drive object:** All objects

**Reaction:** OFF3 (NONE, OFF1, OFF2)

**Acknowledge:** IMMEDIATELY

**Cause:**

A CAN communications error has occurred.

Fault value (r0949, decimal interpretation):

1: The error counter for the send telegrams has exceeded the BUS OFF value 255. The bus disables the CAN controller.

- bus cable short circuit.
- incorrect baud rate.
- incorrect bit timing.
2: The master no longer interrogated the CAN node status longer than for its "life time". The "life time" is obtained from the "guard time" (p8604[0]) multiplied by the "life time factor" (p8604[1]).
- bus cable interrupted.
- bus cable not connected.
- incorrect baud rate.
- incorrect bit timing.
- master fault.

Note:
The fault response can be set as required using p8641.
See also: p8604 (CAN node guarding), p8641 (CAN Abort Connection Option Code)

Remedy:
- check the bus cable
- check the baud rate (p8622).
- check the bit timing (p8623).
- check the master.

The CAN controller must be manually restarted with p8608 = 1 after the cause of the fault has been resolved!
See also: p8608 (CAN Clear Bus Off Error), p8622 (CAN bit rate), p8623 (CAN Bit Timing selection)

Reaction upon A: NONE
Acknowl. upon A: NONE

F08701 CAN: NMT state change
Message value: %1
Drive object: All objects
Reaction: OFF3
Acknowledge: IMMEDIATELY

Cause:
A CANopen NMT state transition from "operational" to "pre-operational" or after "stopped".
Fault value (r0949, decimal interpretation):
1: CANopen NMT state transition from "operational" to "pre-operational".
2: CANopen NMT state transition from "operational" to "stopped".
Note:
In the NMT state "pre-operational", process data cannot be transferred and in the NMT state "stopped", no process data and no service data can be transferred.

Remedy:
Not necessary.
Acknowledge the fault and continue operation.

F08702 (A) CAN: RPDO Timeout
Message value: 
Drive object: All objects
Reaction: OFF3 (NONE, OFF1, OFF2)
Acknowledge: IMMEDIATELY

Cause:
The monitoring time of the CANopen RPDO telegram has expired because the bus connection was either interrupted or the CANopen Master was switched-off.
See also: p8699 (CAN: RPDO monitoring time)

Remedy:
- check the bus cable
- check the master.
- If required, increase the monitoring time (p8699).

Reaction upon A: NONE
Acknowl. upon A: NONE

A08751 CAN: Telegram loss
Message value: 
Drive object: All objects
Reaction: NONE
Acknowledgment: NONE

Cause:
The CAN controller has lost a receive message (telegram).

Remedy:
Reduce the cycle times of the receive messages.
## Faults and alarms

### List of faults and alarms

<table>
<thead>
<tr>
<th>Fault Code</th>
<th>Description</th>
<th>Message value</th>
<th>Drive object</th>
<th>Reaction</th>
<th>Acknowledge</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
</table>
| A08752     | CAN: Error counter for error passive exceeded | -             | All objects  | NONE     | NONE        | The error counter for the send or receive telegrams has exceeded the value 127. | - check the bus cable  
- set a higher baud rate (p8622).  
- check the bit timing and if required optimize (p8623).  
See also: p8622 (CAN bit rate), p8623 (CAN Bit Timing selection) |
| A08753     | CAN: Message buffer overflow | %1            | All objects  | NONE     | NONE        | A message buffer overflow.  
Alarm value (r2124, interpret decimal):  
1: Non-cyclic send buffer (SDO response buffer) overflow.  
2: Non-cyclic receive buffer (SDO receive buffer) overflow.  
3: Cyclic send buffer (PDO send buffer) overflow. | - check the bus cable.  
- set a higher baud rate (p8622).  
- check the bit timing and if required optimize (p8623).  
Re alarm value = 2:  
- reduce the cycle times of the SDO receive messages.  
- SDO request from master only after SDO feedback for previous SDO request.  
See also: p8622 (CAN bit rate), p8623 (CAN Bit Timing selection) |
| A08754     | CAN: Incorrect communications mode | -             | All objects  | NONE     | NONE        | In the "operational" mode, an attempt was made to change parameters p8700 ... p8737. | Change to the "pre-operational" or "stopped" mode. |
| A08755     | CAN: Obj cannot be mapped | -             | All objects  | NONE     | NONE        | The CANopen object is not provided for the Process Data Object (PDO) Mapping. | The following objects can be mapped in the Receive Process Data Object (RPDO) or Transmit Process Data Object (TPDO):  
- RPDO: 6040 hex, 6060 hex, 60FF hex, 6071 hex; 5800 hex - 580F hex; 5820 hex - 5827 hex  
- TPDO: 6041 hex, 6061 hex, 6063 hex, 6069 hex, 606B hex, 606C hex, 6074 hex; 5810 hex - 581F hex; 5830 hex - 5837 hex  
Only sub-index 0 of the specified objects can be mapped.  
Note:  
As long as A08755 is present, the COB-ID cannot be set to valid. |
### A08756 CAN: Number of mapped bytes exceeded

**Message value:** -
**Drive object:** All objects
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** The number of bytes of the mapped objects exceeds the telegram size for net data. A max. of 8 bytes is permissible.
**Remedy:** Map fewer objects or objects with a smaller data type.

See also: p8710, p8711, p8712, p8713, p8714, p8715, p8716, p8717, p8730, p8731, p8732, p8733, p8734, p8735, p8736, p8737

### A08757 CAN: Set COB-ID invalid

**Message value:** -
**Drive object:** All objects
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** For online operation, the appropriate COB-ID must be set invalid before mapping.

**Example:**

Mapping for RPDO 1 should be changed (p8710[0]).

--> set p8700[0] = C00006E0 hex (invalid COB-ID)

--> set p8710[0] as required.

--> p8700[0] enter a valid COB-ID

**Remedy:** Set the COB-ID to invalid.

### A08759 CAN: PDO COB-ID already available

**Message value:** -
**Drive object:** All objects
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** An existing PDO COB-ID was allocated.
**Remedy:** Select another PDO COB-ID.

### A13000 License not adequate

**Message value:** %1
**Drive object:** All objects
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** - for the drive unit, the options that require a license are being used but the licenses are not sufficient.
- an error occurred when checking the existing licenses.

**Alarm value (r2124, interpret decimal):**

0: The existing license is not sufficient.
1: An adequate license was not able to be determined as the memory card with the required licensing data was withdrawn in operation.
2: An adequate license was not able to be determined as there is no licensing data available on the memory card.
3: An adequate license was not able to be determined as there is a checksum error in the license key.
4: An internal error occurred when checking the license.

**Remedy:**

Re alarm value = 0:
Additional licenses are required and these must be activated (p9920, p9921).

Re alarm value = 1:
With the system powered down, re-insert the memory card that matches the system.

Re alarm value = 2:
Enter and activate the license key (p9920, p9921).
Re alarm value = 3:
- Compare the license key (p9920) entered with the license key on the certificate of license.
- Re-enter the license key and activate (p9920, p9921).
Re alarm value = 4:
- carry out a POWER ON.
- upgrade firmware to later version.
- contact the Hotline.

### A13001  Error in license checksum

**Message value:** - 
**Drive object:** All objects  
**Reaction:** NONE 
**Acknowledge:** NONE 
**Cause:** When checking the checksum of the license key, an error was detected. 
**Remedy:** Compare the license key (p9920) entered with the license key on the certificate of license. Re-enter the license key and activate (p9920, p9921).

### F13010  Licensing function module not licensed

**Message value:** %1 
**Drive object:** All objects 
**Reaction:** OFF1 
**Acknowledge:** IMMEDIATELY 
**Cause:** At least one function module which is under license does not have a license. 
Fault value (r0949, interpret hexadecimal): 
Bit x = 1: The corresponding function module does not have a license. 
Note: Refer to p0108 or r0108 for the assignment between the bit number and function module. 
**Remedy:** - enter and activate the license key for function modules under license (p9920, p9921). 
- if necessary, de-activate unlicensed function modules (p0108, r0108). 
See also: p9920 (Licensing, enter license key), p9921 (Licensing, activate license key)

### F30001  Power unit: Overcurrent

**Message value:** Fault cause: %1 bin 
**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN 
**Reaction:** OFF2 
**Acknowledge:** IMMEDIATELY 
**Cause:** The power unit has detected an overcurrent condition. 
- closed-loop control is incorrectly parameterized. 
- motor has a short-circuit or fault to ground (frame). 
- U/f operation: Rated motor current is significantly greater than that of the Motor Module. 
- infed: High discharge and post-charging currents for voltage dip. 
- infed: High post-charging currents for overload when motoring and DC link voltage dip. 
- infed: Short-circuit currents at power-up due to the missing line reactor. 
- power cables are not correctly connected. 
- power cables exceed the maximum permissible length. 
- power unit defective. 
- line phase interrupted. 
Additional causes for a parallel switching device (r0108.15 = 1): 
- a power unit has tripped (powered down) due to a ground fault. 
- the closed-loop circulating current control is either too slow or has been set too fast. 
Fault value (r0949, interpret bitwise binary): 
Bit 0: Phase U. 
Bit 1: Phase V. 
Bit 2: Phase W. 
Bit 3: Overcurrent in the DC link. 
**Note:** Fault value = 0 means that the phase with overcurrent is not recognized (e.g. for blocksize device).
Remedy:
- check the motor data - if required, carry out commissioning.
- check the motor circuit configuration (star-delta)
- U/f operation: Increase up ramp.
- U/f operation: Check the assignment of the rated currents of the motor and Motor Module.
- infeed: Check the line supply quality.
- infeed: Reduce the motor load.
- infeed: Correct connection of the line reactor.
- check the power cable connections.
- check the power cables for short-circuit or ground fault.
- check the length of the power cables.
- replace power unit.
- check the line supply phases.
For a parallel switching device (r0108.15 = 1) the following additionally applies:
- check the ground fault monitoring thresholds (p0287).
- check the setting of the closed-loop circulating current control (p7036, p7037).

F30002  Power unit: DC link voltage, overvoltage
Message value:  %1
Drive object:  SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction:  OFF2
Acknowledge:  IMMEDIATELY
Cause:  The power unit has detected overvoltage in the DC link.
- motor regenerates too much energy.
- device connection voltage too high.
- when operating with a Voltage Sensing Module (VSM), the phase assignment L1, L2, L3 at the VSM differs from the phase assignment at the power unit.
- line phase interrupted.
Fault value (r0949, decimal interpretation):
DC link voltage at the time of trip [0.1 V].
Remedy:
- increase the ramp-down time
- activate the DC link voltage controller
- use a brake resistor or Active Line Module
- increase the current limit of the infeed or use a larger module (for the Active Line Module)
- check the device supply voltage
- check and correct the phase assignment at the VSM and at the power unit
- check the line supply phases.
See also:  p0210 (Drive unit line supply voltage), p1240 (Vdc controller or Vdc monitoring configuration)

F30003  Power unit: DC link voltage, undervoltage
Message value:  
Drive object:  SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction:  OFF2
Acknowledge:  IMMEDIATELY
Cause:  The power unit has detected an undervoltage condition in the DC link.
- line supply failure
- line supply voltage below the permissible value.
- line supply infeed failed or interrupted.
- line phase interrupted.
Note:
The monitoring threshold for undervoltage in the DC link is indicated in r0296.
Remedy:
- check the line supply voltage
- check the line supply infeed and observe the fault messages relating to it (if there are any)
- check the line supply phases.
- check the line supply voltage setting (p0210).
- booksize units: check the setting of p0278.
Note:
The ready signal for the infeed (r0863) must be interconnected to the associated drive inputs (p0864).
See also:  p0210 (Drive unit line supply voltage)
### F30004 Power unit: Overtemperature heat sink AC inverter
- **Message value:** %1
- **Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
- **Reaction:** OFF2
- **Acknowledge:** IMMEDIATELY
- **Cause:**
  - The temperature of the power unit heat sink has exceeded the permissible limit value.
  - insufficient cooling, fan failure.
  - overload.
  - ambient temperature too high.
  - pulse frequency too high.
- **Fault value (r0949):**
  - Temperature [1 bit = 0.01 °C].
- **Remedy:**
  - check whether the fan is running.
  - check the fan elements.
  - check whether the ambient temperature is in the permissible range.
  - check the motor load.
  - reduce the pulse frequency if this is higher than the rated pulse frequency.
- **Notice:**
  - This fault can only be acknowledged after this alarm threshold for alarm A05000 has been undershot.
  - See also: p1800 (Pulse frequency setpoint)

### F30005 Power unit: Overload I2t
- **Message value:** %1
- **Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
- **Reaction:** OFF2
- **Acknowledge:** IMMEDIATELY
- **Cause:**
  - The power unit was overloaded (r0036 = 100 %).
  - the permissible rated power unit current was exceeded for an inadmissibly long time.
  - the permissible load duty cycle was not maintained.
- **Fault value (r0949, decimal interpretation):**
  - I2t [100 % = 16384].
- **Remedy:**
  - reduce the continuous load.
  - adapt the load duty cycle.
- **See also:** r0036 (Power unit overload I2t), r0206 (Rated power unit power), p0307 (Rated motor power)

### F30011 Power unit: Line phase failure in main circuit
- **Message value:** -
- **Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
- **Reaction:** OFF2 (OFF1)
- **Acknowledge:** IMMEDIATELY
- **Cause:**
  - A line phase failure was detected at the power unit.
  - the fuse of a phase of a main circuit has ruptured.
  - the DC link voltage ripple has exceeded the permissible limit value.
- **Note:**
  - The cause may also be a phase failure in the motor feeder cable.
- **Remedy:**
  - check the main circuit fuses.
  - check the motor feeder cables.

### F30012 Power unit: Temperature sensor heat sink wire breakage
- **Message value:** %1
- **Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
- **Reaction:** OFF1 (OFF2)
- **Acknowledge:** IMMEDIATELY
- **Cause:**
  - The connection to a heat sink temperature sensor in the power unit is interrupted.
- **Fault value (r0949, interpret hexadecimal):**
  - Bit 0: Module slot (electronics slot)
  - Bit 1: Air intake
### List of faults and alarms

#### Bit 2: Inverter 1
#### Bit 3: Inverter 2
#### Bit 4: Inverter 3
#### Bit 5: Inverter 4
#### Bit 6: Inverter 5
#### Bit 7: Inverter 6
#### Bit 8: Rectifier 1
#### Bit 9: Rectifier 2

**Remedy:** Contact the manufacturer.

#### F30013 Power unit: Temperature sensor heat sink short-circuit

- **Message value:** %1
- **Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
- **Reaction:** OFF1 (OFF2)
- **Acknowledge:** IMMEDIATELY
- **Cause:**
  - The heat sink temperature sensor in the power unit is short-circuited.
  - Fault value (r0949, interpret hexadecimal):
    - Bit 0: Module slot (electronics slot)
    - Bit 1: Air intake
    - Bit 2: Inverter 1
    - Bit 3: Inverter 2
    - Bit 4: Inverter 3
    - Bit 5: Inverter 4
    - Bit 6: Inverter 5
    - Bit 7: Inverter 6
    - Bit 8: Rectifier 1
    - Bit 9: Rectifier 2
- **Remedy:** Contact the manufacturer.

#### F30015 (N, A) Power unit: Phase failure motor cable

- **Message value:** -
- **Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
- **Reaction:** OFF2 (NONE, OFF1, OFF3)
- **Acknowledge:** IMMEDIATELY
- **Cause:**
  - A phase failure in the motor feeder cable was detected.
  - The signal can also be output in the following case:
    - the motor is correctly connected, however the closed-speed control is instable and therefore an oscillating torque is generated.
  - Note:
    - Chassis power units do not feature phase failure monitoring.
- **Remedy:**
  - check the motor feeder cables.
  - check the speed controller settings.

#### A30016 (N) Power unit: Load supply switched out

- **Message value:** %1
- **Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
- **Reaction:** NONE
- **Acknowledge:** NONE
- **Cause:**
  - The DC link voltage is too low.
  - Alarm value (r2124, interpret decimal):
    - DC link voltage at the time of trip [0.1 V].
- **Remedy:**
  - switch on load supply.
  - check the line supply if necessary.
Faults and alarms

List of faults and alarms

F30017  Power unit: Hardware current limit has responded too often
Message value:  Fault cause: %1 bin
Drive object:  SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction:  OFF2
Acknowl. upon N: IMMEDIATELY
Cause:  The hardware current limitation in the relevant phase (see A30031, A30032, A30033) has responded too often. The number of times the limit has been exceeded depends on the design and type of power unit. For infeed units, the following applies:
- closed-loop control is incorrectly parameterized.
- load on the infeed is too high.
- Voltage Sensing Module incorrectly connected.
- line reactor missing or the incorrect type.
- power unit defective.
The following applies to Motor Modules:
- closed-loop control is incorrectly parameterized.
- fault in the motor or in the power cables.
- the power cables exceed the maximum permissible length.
- motor load too high
- power unit defective.
Fault value (r0949, interpret binary):
Bit 0: Phase U
Bit 1: Phase V
Bit 2: Phase W
Remedy:  For infeed units, the following applies:
- check the controller settings and reset and identify the controller if necessary (p0340 = 2, p3410 = 5)
- reduce the load and increase the DC-link capacitance or use a higher-rating infeed if necessary
- check the connection of the optional Voltage Sensing Module
- check the connection and technical data of the line reactor
- check the power cables for short-circuit or ground fault.
- replace power unit.
The following applies to Motor Modules:
- check the motor data and if required, recalculate the controller parameters (p0340 = 3). As an alternative, run a motor data identification (p1910 = 1, p1960 = 1).
- check the motor circuit configuration (star-delta).
- check the motor load.
- check the power cable connections.
- check the power cables for short-circuit or ground fault.
- check the length of the power cables.
- replace power unit.

F30020  Power unit: Configuration not supported
Message value:  fault cause: %1, additional information: %2
Drive object:  SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction:  OFF2
Acknowl. upon N: IMMEDIATELY
Cause:  A configuration is requested that is not supported by the power unit.
Fault value (r0949, interpret hexadecimal):
yyyyxxxx hex: xxxx = fault cause, yyyy = additional information (siemensintern)
xxxx = 0: Autonomous operation is requested but is not supported.
xxxx = 1: The requested DRIVE-CLiQ timing is not permissible.
xxxx = 2: A PM260 has been detected with PS-ASIC version 2. This combination is not supported.
xxxx = 3: Initialization was not able to be successfully completed. It is possible that the Control Unit was withdrawn from the power module before or during power-up.
xxxx = 4: The combination of power unit and Control Unit or Control Unit Adapter is not supported.
xxxx = 5: The higher current controller dynamic performance is not supported.
List of faults and alarms

Remedy:

Re fault cause = 0:
- If required, deactivate an active internal voltage protection (p1231).
Re fault cause = 1:
- Update the Control Unit firmware or change the DRIVE-CLiQ topology.
Re fault cause = 2:
- Replace the power unit with a PM260 with PS-ASIC version 3 (or higher).
Re fault cause = 3, 4:
- Insert a Control Unit or Control Unit Adapter (CUAxx) on an appropriate Power Module and perform a POWER ON for the Control Unit or the Control Units Adapter.
Re fault cause = 5:
- use a booksize format power unit.
- for a Double Motor Module operate the two drive controls with the same current controller sampling time (p0115[0]).
Otherwise, the higher current controller dynamics can only be activated on the drive with the longer sampling time.
- If required, de-select the higher current controller dynamic performance (p1810.11 = 0). After deselecting the computing dead time, recalculate the controller gains (p0340 = 4). If required, optimize the speed controller.

See also: p1231 (Armature short-circuit / DC braking configuration), p1810 (Modulator configuration)

F30021 Power unit: Ground fault

Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF2
Acknowledge: IMMEDIATELY
Cause:
- Power unit has detected a ground fault.
- ground fault in the power cables.
- winding fault or ground fault at the motor.
- CT defective.
Additional cause for CU310/CUA31:
- when the brake is applied, this causes the hardware DC current monitoring to respond.
Additional cause for parallel switching devices (r0108.15 = 1):
- the closed-loop circulating current control is either too slow or has been set too fast.
Fault value (r0949, decimal interpretation):
- Absolute value, total current amplitude [20479 = r0209 x 1.4142].
Note:
- For power units, a ground fault is also emulated in r3113.5.

Remedy:
- check the power cable connections.
- check the motor.
- check the CT.
The following applies additionally for CU310/CUA31:
- check the cables and contacts of the brake connection (a wire is possibly broken).
For parallel switching devices (r0108.15 = 1) the following additionally applies:
- check the ground fault monitoring thresholds (p0287).
- check the setting of the closed-loop circulating current control (p7036, p7037).
See also: p0287 (Ground fault monitoring thresholds)

F30022 Power unit: Monitoring U_ce

Message value: Fault cause: %1 bin
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF2
Acknowledge: POWER ON
Cause:
- In the power unit, the monitoring of the collector-emitter voltage (U_ce) of the semiconductor has responded.
Possible causes:
- fiber-optic cable interrupted.
- power supply of the IGBT gating module missing.
- short-circuit at the power unit output.
- defective semiconductor in the power unit.
Fault value (r0949, interpret binary):
- Bit 0: Short-circuit in phase U
- Bit 1: Short circuit in phase V
- Bit 2: Short-circuit in phase W
Faults and alarms

List of faults and alarms

Bit 3: Light transmitter enable defective
Bit 4: U_ce group fault signal interrupted
See also: r0949 (Fault value)

Remedy:
- check the fiber-optic cable and if required, replace.
- check the power supply of the IGBT gating module (24 V).
- check the power cable connections.
- select the defective semiconductor and replace.

**F30024 Power unit: Overtemperature thermal model**

Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF2
Acknowledge: IMMEDIATELY

Cause:
The temperature difference between the heat sink and chip has exceeded the permissible limit value.
- the permissible load duty cycle was not maintained.
- insufficient cooling, fan failure.
- overload.
- ambient temperature too high.
- pulse frequency too high.
See also: r0037

Remedy:
- adapt the load duty cycle.
- check whether the fan is running.
- check the fan elements.
- check whether the ambient temperature is in the permissible range.
- check the motor load.
- reduce the pulse frequency if this is higher than the rated pulse frequency.

**F30025 Power unit: Chip overtemperature**

Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF2
Acknowledge: IMMEDIATELY

Cause:
Chip temperature of the semiconductor has exceeded the permissible limit value.
- the permissible load duty cycle was not maintained.
- insufficient cooling, fan failure.
- overload.
- ambient temperature too high.
- pulse frequency too high.

Fault value (r0949):
Temperature difference between the heat sink and chip [1 Bit = 0.01 °C].

Remedy:
- adapt the load duty cycle.
- check whether the fan is running.
- check the fan elements.
- check whether the ambient temperature is in the permissible range.
- check the motor load.
- reduce the pulse frequency if this is higher than the rated pulse frequency.

Notice:
This fault can only be acknowledged after this alarm threshold for alarm A05001 has been undershot.
See also: r0037

**F30027 Power unit: Precharging DC link time monitoring**

Message value: Enable signals: %1, Status: %2
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF2
Acknowledge: IMMEDIATELY

Cause:
The power unit DC link was not able to be pre-charged within the expected time.
1) There is no line supply voltage connected.
2) The line contactor/line side switch has not been closed.
3) The line supply voltage is too low.
4) Line supply voltage incorrectly set (p0210).
5) The pre-charging resistors are overheated as there were too many pre-charging operations per time unit.
6) The pre-charging resistors are overheated as the DC link capacitance is too high.
7) The pre-charging resistors are overheated because when there is no "ready for operation" (r0863.0) of the infeed unit, power is taken from the DC link.
8) The pre-charging resistors are overheated as the line contactor was closed during the DC link fast discharge through the Braking Module.
9) The DC link has either a ground fault or a short-circuit.
10) The pre-charging circuit is possibly defective (only for chassis units).
11) Infeed is defective and/or fuse has ruptured in the Motor Module (only Booksize units).

Fault value (r0949, interpret binary):
yyyyxxxx hex:
yyyy = power unit state
0: Fault status (wait for OFF and fault acknowledgement).
1: Restart inhibit (wait for OFF).
2: Overvoltage condition detected -> change into the fault state.
3: Undervoltage condition detected -> change into the fault state.
4: Wait for bypass contactor to open -> change into the fault state.
5: Wait for bypass contactor to open -> change into restart inhibit.
6: Commissioning.
7: Ready for pre-charging.
8: Pre-charging started, DC link voltage less than the minimum switch-on voltage.
9: Pre-charging, DC link voltage end of pre-charging still not detected.
10: Wait for the end of the de-bounce time of the main contactor after pre-charging has been completed.
11: Pre-charging completed, ready for pulse enable.
12: It was detected that the STO terminal was energized at the power unit.
xxxx = Missing internal enable signals, power unit (inverted bit-coded, FFFF hex -> all internal enable signals available)
Bit 0: Power supply of the IGBT gating shut down.
Bit 1: Ground fault detected.
Bit 2: Peak current intervention.
Bit 3: I2t exceeded.
Bit 4: Thermal model overtemperature calculated.
Bit 5: (heat sink, gating module, power unit) overtemperature measured.
Bit 6: Reserved.
Bit 7: Overvoltage detected.
Bit 8: Power unit has completed pre-charging, ready for pulse enable.
Bit 9: STO terminal missing.
Bit 10: Overcurrent detected.
Bit 11: Armature short-circuit active.
Bit 12: DRIVE-CLiQ fault active.
Bit 13: Vce fault detected, transistor de-saturated due to overcurrent/short-circuit.
Bit 14: Undervoltage detected.
See also: p0210 (Drive unit line supply voltage)

Remedy:
In general:
- check the line supply voltage at the input terminals.
- check the line supply voltage setting (p0210).
For booksize drive units, the following applies:
- wait (approx. 8 minutes) until the pre-charging resistors have cooled down. For this purpose, preferably disconnect the infeed unit from the line supply.
Re 5):
- carefully observe the permissible pre-charging frequency (refer to the appropriate Equipment Manual).
Re 6):
- check the total capacitance of the DC link and reduce in accordance with the maximum permissible DC-link capacitance if necessary (refer to the appropriate Equipment Manual)
Re 7):
- interconnect the ready-for-operation signal from the infeed unit (r0863.0) in the enable logic of the drives connected to this DC link
Re 8):
- check the connections of the external line contactor. The line contactor must be open during DC-link fast discharge.
Re 9):
- check the DC link for ground faults or short circuits.
### Re 11:
- Check the DC link voltage of the infeed (r0070) and Motor Modules (r0070).
If the DC link voltage generated by the infeed (or external) is not displayed for the Motor Modules (r0070), then a fuse has ruptured in the Motor Module.
See also: p0210 (Drive unit line supply voltage)

### A30031  Power unit: Hardware current limiting, phase U

**Message value:**
- 

**Drive object:**
SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

**Reaction:**
NONE

**Acknowledge:**
NONE

**Cause:**
Hardware current limit for phase U responded. The pulsing in this phase is inhibited for one pulse period.
- closed-loop control is incorrectly parameterized.
- fault in the motor or in the power cables.
- the power cables exceed the maximum permissible length.
- motor load too high
- power unit defective.

**Note:**
Alarm A30031 is always output if, for a Power Module, the hardware current limiting of phase U, V or W responds.

**Remedy:**
- check the motor data and if required, recalculate the controller parameters (p0340 = 3). As an alternative, run a motor data identification (p1910 = 1, p1960 = 1).
- check the motor circuit configuration (star-delta)
- check the motor load.
- check the power cable connections.
- check the power cables for short-circuit or ground fault.
- check the length of the power cables.

### A30032  Power unit: Hardware current limiting, phase V

**Message value:**
- 

**Drive object:**
SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

**Reaction:**
NONE

**Acknowledge:**
NONE

**Cause:**
Hardware current limit for phase V responded. The pulsing in this phase is inhibited for one pulse period.
- closed-loop control is incorrectly parameterized.
- fault in the motor or in the power cables.
- the power cables exceed the maximum permissible length.
- motor load too high
- power unit defective.

**Note:**
Alarm A30031 is always output if, for a Power Module, the hardware current limiting of phase U, V or W responds.

**Remedy:**
Check the motor data and if required, recalculate the controller parameters (p0340 = 3). As an alternative, run a motor data identification (p1910 = 1, p1960 = 1).
- check the motor circuit configuration (star-delta)
- check the motor load.
- check the power cable connections.
- check the power cables for short-circuit or ground fault.
- check the length of the power cables.

### A30033  Power unit: Hardware current limiting, phase W

**Message value:**
- 

**Drive object:**
SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

**Reaction:**
NONE

**Acknowledge:**
NONE

**Cause:**
Hardware current limit for phase W responded. The pulsing in this phase is inhibited for one pulse period.
- closed-loop control is incorrectly parameterized.
- fault in the motor or in the power cables.
- the power cables exceed the maximum permissible length.
- motor load too high
- power unit defective.
Note:
Alarm A30031 is always output if, for a Power Module, the hardware current limiting of phase U, V or W responds.

Remedy:
- check the motor data and if required, recalculate the controller parameters (p0340 = 3). As an alternative, run a motor data identification (p1910 = 1, p1960 = 1).
- check the motor circuit configuration (star-delta)
- check the motor load
- check the power cable connections
- check the power cables for short-circuit or ground fault
- check the length of the power cables.

A30034 Power unit: Internal overtemperature

Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: The alarm threshold for internal overtemperature has been reached.
If the temperature inside the unit continues to increase, fault F30036 may be triggered.
- ambient temperature might be too high.
- insufficient cooling, fan failure.
Fault value (r0949, interpret binary):
Bit 0 = 1: Control electronics range.
Bit 1 = 1: Power electronics range.
Remedy:
- check the ambient temperature.
- check the fan for the inside of the unit.

F30035 Power unit: Air intake overtemperature

Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF1 (OFF2)
Acknowledge: IMMEDIATELY
Cause: The air intake in the power unit has exceeded the permissible temperature limit.
For air-cooled power units, the temperature limit is at 55 °C.
- ambient temperature too high.
- insufficient cooling, fan failure.
Fault value (r0949, decimal interpretation):
Temperature [0.01 °C].
Remedy:
- check whether the fan is running.
- check the fan elements.
- check whether the ambient temperature is in the permissible range.
Notice:
This fault can only be acknowledged after this alarm threshold for alarm A05002 has been undershot.

F30036 Power unit: Internal overtemperature

Message value: %1
Drive object: All objects
Reaction: OFF2
Acknowledge: IMMEDIATELY
Cause: For chassis power units, the following applies:
The temperature inside the drive converter has exceeded the permissible temperature limit.
- insufficient cooling, fan failure.
- overload.
- ambient temperature too high.
Fault value (r0949, interpret binary):
Bit 0 = 1: Overtemperature in the control electronics range.
Bit 1 = 1: Overtemperature in the power electronics range.
### Faults and alarms

**List of faults and alarms**

| Remedy: | - check whether the fan is running.  
|         | - check the fan elements.  
|         | - check whether the ambient temperature is in the permissible range.  
| Notice: | This fault can only be acknowledged once the permissible temperature limit minus 5 K has been fallen below. |

**F30037**  
**Power unit: Rectifier overtemperature**

**Message value:** %1  
**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
**Reaction:** OFF2  
**Acknowledge:** IMMEDIATELY  
**Cause:** The temperature in the rectifier of the power unit has exceeded the permissible temperature limit.  
- insufficient cooling, fan failure.  
- overload.  
- ambient temperature too high.  
- line supply phase failure.  
Fault value (r0949, decimal interpretation): Temperature [0.01 °C].  
**Remedy:** - check whether the fan is running.  
- check the fan elements.  
- check whether the ambient temperature is in the permissible range.  
- check the motor load.  
- check the line supply phases.  
**Notice:** This fault can only be acknowledged after this alarm threshold for alarm A05004 has been undershot.

**F30040**  
**Power unit: Undervolt 24 V**

**Message value:** %1  
**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
**Reaction:** OFF2  
**Acknowledge:** IMMEDIATELY (POWER ON)  
**Cause:** Failure of the 24 V power supply for the power unit.  
- The undervoltage threshold was undershot for longer than 3 ms.  
Fault value (r0949, decimal interpretation): 24 V voltage [0.1 V].  
**Remedy:** - check the 24 V DC power supply of the power unit.  
- carry out a POWER ON (power off/on) for the component.

**A30041 (F)**  
**Power unit: Undervoltage 24 V alarm**

**Message value:** %1  
**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
**Reaction:** NONE  
**Acknowledge:** NONE  
**Cause:** 24 V power supply fault for the power unit.  
- the 16 V threshold was undershot.  
Alarm value (r2124, interpret decimal): 24 V voltage [0.1 V].  
**Remedy:** - check the 24 V DC power supply of the power unit.  
- carry out a POWER ON (power off/on) for the component.  
**Reaction upon F:** NONE (OFF1, OFF2, OFF3)  
**Acknowl. upon F:** IMMEDIATELY (POWER ON)
**A30042**  
**Power unit: Fan operating time reached or exceeded**

- **Message value:** %1  
- **Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
- **Reaction:** NONE  
- **Acknowledge:** NONE  
- **Cause:** The maximum operating time of the fan in the power unit is set in p0252. This message indicates the following:
  - Fault value (r0949, decimal interpretation):
    - 0: The maximum fan operating time is 500 hours.
    - 1: The maximum fan operating time has been exceeded.
- **Remedy:** Replace the fan in the power unit and reset the operating hours counter to 0 (p0251 = 0). See also: p0251 (Operating hours counter power unit fan), p0252 (Maximum operating time power unit fan)

**F30043**  
**Power unit: Overvolt 24 V**

- **Message value:** -  
- **Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
- **Reaction:** OFF2  
- **Acknowledge:** POWER ON  
- **Cause:** The following applies for CU31x:
  - Overvoltage of the 24 V power supply for the power unit.
    - the 31.5 V threshold was exceeded for more than 3 ms.
  - Fault value (r0949, decimal interpretation):
    - 24 V voltage [0.1 V].
- **Remedy:** Check the 24 V DC power supply of the power unit.

**A30044 (F)**  
**Power unit: Overvoltage 24 V alarm**

- **Message value:** -  
- **Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
- **Reaction:** NONE  
- **Acknowledge:** NONE  
- **Cause:** The following applies for CU31x:
  - 24 V power supply fault for the power unit.
    - the 32.0 V threshold was exceeded.
  - Alarm value (r2124, interpret decimal):
    - 24 V voltage [0.1 V].
- **Remedy:** Check the 24 V DC power supply of the power unit.

**F30045**  
**Power unit: Supply undervoltage**

- **Message value:** %1  
- **Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
- **Reaction:** OFF2  
- **Acknowledge:** IMMEDIATELY (POWER ON)  
- **Cause:** Power supply fault in the power unit.
  - The voltage monitor signals an undervoltage fault on the module.
  - The following applies for CU31x:
    - the voltage monitoring on the DAC board signals an undervoltage fault on the module.
- **Remedy:**
  - check the 24 V DC voltage supply to power unit.
  - carry out a POWER ON (power off/on) for the component.
  - replace the module if necessary.
### A30046 (F) Power unit: Undervoltage, alarm

- **Message value:** %1
- **Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
- **Reaction:** NONE
- **Acknowledge:** NONE
- **Cause:** Before the last restart, a problem occurred at the power unit power supply.
  - the voltage monitor in the internal FPGA of the PSA signals an undervoltage fault on the module.
  - Fault value (r0949): Register value of the voltage fault register.
- **Remedy:**
  - check the 24 V DC voltage supply to power unit.
  - carry out a POWER ON (power off/on) for the component.
  - replace the module if necessary.
- **Reaction upon F:** NONE (OFF1, OFF2, OFF3)
- **Acknowl. upon F:** IMMEDIATELY (POWER ON)

### A30048 Power unit: External fan faulty

- **Message value:** -
- **Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
- **Reaction:** NONE
- **Acknowledge:** NONE
- **Cause:** The feedback signal from the external fan indicates a fault.
  - fan faulty, blocked.
  - feedback signal inaccurate.
- **Remedy:**
  - check the external fan and replace if necessary.
  - if you are using an external fan with feedback, check its wiring (X12.2 or X13.2).
  - Note: If you are using an external fan without feedback, check that the feedback terminal wiring on the power unit is connected to ground and make this connection if necessary (X12.1/2 or X13.1/2).

### A30049 Power unit: Internal fan faulty

- **Message value:** -
- **Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
- **Reaction:** NONE
- **Acknowledge:** NONE
- **Cause:** The internal fan has failed.
- **Remedy:** Check the internal fan and replace if necessary.

### F30050 Power unit: 24 V supply overvoltage

- **Message value:** -
- **Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
- **Reaction:** OFF2
- **Acknowledge:** POWER ON
- **Cause:** The voltage monitor signals an overvoltage fault on the module.
- **Remedy:**
  - check the 24 V power supply.
  - replace the module if necessary.

### F30052 EEPROM data error

- **Message value:** %1
- **Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
- **Reaction:** NONE
- **Acknowledge:** POWER ON
- **Cause:** EEPROM data error of the power unit module.
**Fault value (r0949, interpret hexadecimal):**
0: The EEPROM data read in from the power unit module is inconsistent.
1: EEPROM data is not compatible to the firmware of the power unit application.

**Additional values:**
Only for internal Siemens troubleshooting.

**Remedy:**
For fault value = 0:
Replace the power unit module or update the EEPROM data.
For fault value = 1:
The following applies for CU31x and CUA31:
Update the firmware `\SIEMENS\SINAMICS\CODE\SAC\cu31xi.ufw` (cua31.ufw)

### A30054 (F) Power unit: Undervoltage when opening the brake

<table>
<thead>
<tr>
<th><strong>Message value:</strong></th>
<th>%1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drive object:</strong></td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
</tr>
<tr>
<td><strong>Reaction:</strong></td>
<td>NONE</td>
</tr>
<tr>
<td><strong>Acknowledge:</strong></td>
<td>NONE</td>
</tr>
<tr>
<td><strong>Cause:</strong></td>
<td>When the brake is being opened, it is detected that the power supply voltage is less than 24 V - 10% = 21.6V. Alarm value (r2124, interpret decimal): Supply voltage fault [0.1 V]. Example: Alarm value = 212 -&gt; voltage = 21.2 V</td>
</tr>
<tr>
<td><strong>Remedy:</strong></td>
<td>Check the 24V power supply for stability and value.</td>
</tr>
<tr>
<td><strong>Reaction upon F:</strong></td>
<td>NONE (OFF1, OFF2, OFF3)</td>
</tr>
<tr>
<td><strong>Acknowl. upon F:</strong></td>
<td>IMMEDIATELY</td>
</tr>
</tbody>
</table>

### F30055 Power unit: Braking chopper overcurrent

<table>
<thead>
<tr>
<th><strong>Message value:</strong></th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drive object:</strong></td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
</tr>
<tr>
<td><strong>Reaction:</strong></td>
<td>OFF2</td>
</tr>
<tr>
<td><strong>Acknowledge:</strong></td>
<td>IMMEDIATELY</td>
</tr>
<tr>
<td><strong>Cause:</strong></td>
<td>An overcurrent condition has occurred in the braking chopper.</td>
</tr>
<tr>
<td><strong>Remedy:</strong></td>
<td>- check whether the braking resistor has a short circuit. - for an external braking resistor, check whether the resistor may have been dimensioned too small. Note: The braking chopper is only enabled again at pulse enable after the fault has been acknowledged.</td>
</tr>
</tbody>
</table>

### F30060 (A) Pre-charge contactor state monitoring

<table>
<thead>
<tr>
<th><strong>Message value:</strong></th>
<th>Fault cause: %1 bin</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drive object:</strong></td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
</tr>
<tr>
<td><strong>Reaction:</strong></td>
<td>OFF2 (NONE, OFF1)</td>
</tr>
<tr>
<td><strong>Acknowledge:</strong></td>
<td>IMMEDIATELY (POWER ON)</td>
</tr>
<tr>
<td><strong>Cause:</strong></td>
<td>At the end of the monitoring time (p0255[0]), the actual state of the pre-charge contactor does not match the desired state. Bit 0: Monitoring time exceeded. Bit 1: Contactator opened during operation. Bit 2: Contactator closed in OFF state.</td>
</tr>
<tr>
<td><strong>Remedy:</strong></td>
<td>- check the monitoring time setting (p0255[0]). - check the contactator wiring and activation. - replace the contactor.</td>
</tr>
<tr>
<td><strong>Reaction upon A:</strong></td>
<td>NONE</td>
</tr>
<tr>
<td><strong>Acknowl. upon A:</strong></td>
<td>NONE</td>
</tr>
</tbody>
</table>
**Faults and alarms**

**List of faults and alarms**

---

**F30061 (A) Bypass contactor monitoring**

**Message value:** Fault cause: %1 bin

**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

**Reaction:** OFF2 (NONE, OFF1)

**Acknowledge:** IMMEDIATELY (POWER ON)

**Cause:** At the end of the monitoring time (p0255[1]), the actual state of the bypass contactor does not match the desired state.

Fault value (r0949, interpret bitwise binary):
- Bit 0: Monitoring time exceeded.
- Bit 1: Contactor opened during operation.
- Bit 2: Contactor closed in OFF state.

**Remedy:**
- check the monitoring time setting (p0255[1]).
- check the contactor wiring and activation.
- replace the contactor.

**Reaction upon A:** NONE

**Acknowl. upon A:** NONE

---

**F30070 Cycle requested by the power unit module not supported**

**Message value:** %1

**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

**Reaction:** OFF2

**Acknowledge:** IMMEDIATELY

**Cause:** A cycle is requested that is not supported by the power unit.

Fault value (r0949, interpret hexadecimal):
- 0: The current control cycle is not supported.
- 1: The DRIVE-CLiQ cycle is not supported.
- 2: Internal timing problem (clearance between RX and TX instants too low).
- 3: Internal timing problem (TX instant too early).

**Remedy:**
- The power unit only supports the following cycles:
  - 62.5 µs, 125 µs, 250 µs and 500 µs
  - For fault value = 0:
    - Set a permitted current control cycle.
  - For fault value = 1:
    - Set a permitted DRIVE-CLiQ cycle.
  - For fault value = 2, 3:
    - Contact the manufacturer (you may have an incompatible firmware version).

---

**F30071 No new actual values received from the power unit module**

**Message value:** -

**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

**Reaction:** OFF2

**Acknowledge:** IMMEDIATELY

**Cause:** The number of actual value telegrams from the power unit module that have failed has exceeded the permissible number.

**Remedy:** Check the interface (adjustment and locking) to the power unit module.

---

**F30072 Setpoints are no longer being transferred to the power unit**

**Message value:** -

**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

**Reaction:** OFF2

**Acknowledge:** IMMEDIATELY

**Cause:** The following applies for CU31x and CUA31:

More than one setpoint telegram was not able to be transferred to the power unit module.

**Remedy:**
- The following applies for CU31x and CUA31:
  - Check the interface (adjustment and locking) to the power unit module.
### A30073 (N)
**Actual value/setpoint preprocessing no longer synchronous**

**Message value:** -  
**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
**Reaction:** NONE  
**Acknowledge:** NONE  
**Cause:** Communication with the power unit module is no longer in synchronism with the current control cycle.  
**Remedy:** Wait until synchronization is re-established.  
**Reaction upon N:** NONE  
**Acknowl. upon N:** NONE

### F30074 (A)
**Communication error between the Control Unit and Power Module**

**Message value:** %1  
**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
**Reaction:** NONE  
**Acknowledge:** IMMEDIATELY  
**Cause:** Communications between the Control Unit (CU) and Power Module (PM) via the interface no longer possible. The CU may have been withdrawn or is incorrectly inserted.  
- Fault value (r0949, interpret hexadecimal):  
  - 0 hex: The Control Unit was withdrawn from the Power Module during operation.  
  - 1 hex: The Control Unit was withdrawn from the Power Module during operation, although the encoderless safe motion monitoring functions are enabled. This is not supported. After re-inserting the Control Unit in operation, communications to the Power Module no longer possible.  
  - 20A hex: The Control Unit was inserted on a Power Module, which has another code number.  
  - 20B hex: The Control Unit was inserted on a Power Module, which although it has the same code number, has a different serial number.  
  - 601 hex: The Control Unit was inserted on a Power Module, whose power/performance class (chassis unit) is not supported.  
**Remedy:** Reinsert the Control Unit (CU) or the Control Unit adapter (CUAxx) onto the original Power Module and continue operation. If required, carry out a POWER ON for the CU and/or the CUA.  
**Reaction upon A:** NONE  
**Acknowl. upon A:** NONE

### F30080
**Power unit: Current increasing too quickly**

**Message value:** Fault cause: %1 bin  
**Drive object:** All objects  
**Reaction:** OFF2  
**Acknowledge:** IMMEDIATELY  
**Cause:** The power unit has detected an excessive rate of rise in the overvoltage range.  
- closed-loop control is incorrectly parameterized.  
- motor has a short-circuit or fault to ground (frame).  
- U/f operation: Rated motor current is significantly greater than that of the Motor Module.  
- power cables are not correctly connected.  
- power cables exceed the maximum permissible length.  
- power unit defective.  
**Fault value (r0949, interpret bitwise binary):**  
- Bit 0: Phase U.  
- Bit 1: Phase V.  
- Bit 2: Phase W.
### Faults and alarms

#### List of faults and alarms

**Remedy:**
- check the motor data - if required, carry out commissioning.
- check the motor circuit configuration (star-delta)
- U/f operation: Increase up ramp.
- U/f operation: Check the assignment of the rated currents of the motor and Motor Module.
- check the power cable connections.
- check the power cables for short-circuit or ground fault.
- check the length of the power cables.
- replace power unit.

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Message value</th>
<th>Drive object</th>
<th>Reaction</th>
<th>Acknowledge</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
</table>
| F30081  | **Power unit: Switching operations too frequent** | Fault cause: %1 bin | All objects                  | OFF2     | IMMEDIATELY | The power unit has executed too many switching operations for current limitation.  
- closed-loop control is incorrectly parameterized.  
- motor has a short-circuit or fault to ground (frame).  
- U/f operation: Rated motor current is significantly greater than that of the Motor Module.  
- power cables are not correctly connected.  
- power cables exceed the maximum permissible length.  
- power unit defective.  
Fault value (r0949, interpret bitwise binary):  
Bit 0: Phase U.  
Bit 1: Phase V.  
Bit 2: Phase W. | - check the motor data - if required, carry out commissioning.  
- check the motor circuit configuration (star-delta)  
- U/f operation: Increase up ramp.  
- U/f operation: Check the assignment of the rated currents of the motor and Motor Module.  
- check the power cable connections.  
- check the power cables for short-circuit or ground fault.  
- check the length of the power cables.  
- replace power unit. |
| F30105  | **PU: Actual value sensing fault**               | -             | SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN | OFF2     | IMMEDIATELY | At least one incorrect actual value channel was detected on the Power Stack Adapter (PSA).  
The incorrect actual value channels are displayed in the following diagnostic parameters.  
Remedy:  
Evaluate the diagnostic parameters.  
If the actual value channel is incorrect, check the components and if required, replace. |
| F30314  | **Power unit: 24 V power supply overloaded by PM** | -             | SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN | OFF2     | IMMEDIATELY (POWER ON) | The 24 V power supply through the Power Module (PM) is overloaded.  
An external 24 V power supply via X124 on the Control Unit is not connected. | Connect an external 24 V power supply via X124 at the Control Unit. |
A30315 (F)  Power unit: 24 V power supply overloaded by PM
Message value:  -
Drive object:  SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction:  NONE
Acknowledge:  NONE
Cause:  The 24 V power supply through the Power Module (PM) is overloaded. 
        An external 24 V power supply via X124 on the Control Unit is not connected.
Remedy:  Connect an external 24 V power supply via X124 at the Control Unit.
Reaction upon F:  NONE (OFF1, OFF2, OFF3)
Acknowl. upon F:  IMMEDIATELY (POWER ON)

A30502  Power unit: DC link overvoltage
Message value:  %1
Drive object:  SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction:  NONE
Acknowledge:  NONE
Cause:  The power unit has detected overvoltage in the DC link on a pulse inhibit. 
        - device connection voltage too high. 
        - line reactor incorrectly dimensioned.
Fault value (r0949, decimal interpretation):  
        DC link voltage [1 bit = 100 mV]. 
        See also: r0070 (Actual DC link voltage)
Remedy:  
        - check the device supply voltage (p0210). 
        - check the dimensioning of the line reactor. 
        See also: p0210 (Drive unit line supply voltage)

F30600  SI MM: STOP A initiated
Message value:  %1
Drive object:  SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction:  OFF2
Acknowledge:  IMMEDIATELY (POWER ON)
Cause:  The "Safety Integrated" function integrated in the drive in the Motor Module (MM) has detected a fault and initiated 
        STOP A (pulse suppression via the safety shutdown path of the Motor Module). 
        - forced checking procedure of the safety shutdown path of the Motor Module unsuccessful. 
        - subsequent response to fault F30611 (defect in a monitoring channel). 
Fault value (r0949, decimal interpretation):  
        0: Stop request from the Control Unit. 
        1005: Pulses suppressed although STO not selected and there is no internal STOP A present. 
        1010: Pulses enabled although STO is selected or an internal STOP A is present. 
        1020: Internal software error in the "Internal voltage protection" function. The "internal voltage protection" function is 
        withdrawn. A STOP A that cannot be acknowledged is initiated. 
        9999: Subsequent response to fault F30611.
Remedy:  
        - select Safe Torque Off and de-select again. 
        - replace the Motor Module involved. 
        For fault value = 1020: 
        - carry out a POWER ON (power off/on) for all components. 
        - upgrade the Motor Module software. 
        - replace the Motor Module. 
        For fault value = 9999: 
        - carry out diagnostics for fault F30611.
Note:  
        CU: Control Unit 
        MM: Motor Module 
        SI: Safety Integrated 
        STO: Safe Torque Off / SH: Safe standstill
Faults and alarms
List of faults and alarms

F30611 SI MM: Defect in a monitoring channel

Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE (OFF1, OFF2, OFF3)
Acknowledge: IMMEDIATELY (POWER ON)
Cause: The "Safety Integrated" function integrated in the drive in the Motor Module (MM) has detected a fault in the cross-wise data comparison between the Control Unit (CU) and MM and initiated a STOP F. As a result of this fault, after the parameterized transition has expired (p9858), fault F30600 is output (SI MM: STOP A initiated).

Fault value (r0949, decimal interpretation):
0: Stop request from the Control Unit.
1 ... 999:
- Number of the cross-checked data that resulted in this fault. This number is also displayed in r9895.
- SI monitoring clock cycle (r9780, r9880).
- SI enable safety functions (p9601, p9801). Crosswise data comparison is only carried out for the supported bits.
- SI SGE changeover tolerance time (p9650, p9850).
- SI transition period STOP F to STOP A (p9658, p9858).
- SI enable Safe Brake Control (p9602, p9802).
- SI Motion enable, safety-relevant functions (p9501, internal value).
- SI pulse suppression delay time for Safe Stop 1 (p9652, p9852).
- SI PROFIsafe address (p9610, p9810).
- SI debounce time for Safe Stop 1 (p9651, p9851).
- SI delay time for pulse suppression for ESR (p9697, p9897).
- SI Safe Brake Adapter mode, BICO interconnection (p9621, p9821).
- SI Safe Brake Adapter relay ON time (p9622[0], p9822[0]).
- SI Safe Brake Adapter relay OFF time (p9622[1], p9822[1]).
1000: Watchdog timer has expired. Within the time of approx. 5 x p9850 too many switching operations have occurred at the safety-related inputs of the Control Unit, or STO (also as subsequent response) was initiated too frequently via PROFIsafe/TS54F.
1001, 1002: Initialization error, change timer / check timer.
1950: Module temperature outside the permissible temperature range.
1951: Module temperature not plausible.
2000: Status of the STO selection on the Control Unit and Motor Module are different.
2001: Feedback signal for safe pulse suppression on the Control Unit and Motor Module are different.
2002: Status of the delay timer SS1 on the Control Unit and Motor Module are different.
6000 ... 6999:
- PROFIsafe: Remove contact problems/faults at the PROFIBUS master/PROFINET controller.
- check the wiring of the failsafe inputs at the TM54F (contact problems).
Remedy: Re fault value = 1 ... 5 and 7 ... 999:
- check the cross-checked data that resulted in a STOP F.
- carry out a POWER ON (power off/on) for all components.
- upgrade the Motor Module software.
- upgrade the Control Unit software.
For fault value = 6:
- check the wiring of the safety-relevant inputs (SGE) on the Control Unit (contact problems).
- PROFIsafe: Remove contact problems/faults at the PROFIBUS master/PROFINET controller.
- check the wiring of the failsafe inputs at the TM54F (contact problems).
Re fault value = 1000:
- carry out a POWER ON (power off/on) for all components.
- upgrade the Motor Module software.
- upgrade the Control Unit software.
For fault value = 1001, 1002:
- check the tolerance time SGE changeover and if required, increase the value (p9650/p9850, p9652/p9852).
- check the wiring of the safety-relevant inputs (SGE) (contact problems).
- check the cause of the STO selection in r9772. When the SMM functions are active (p9501 = 1), STO can also be selected using these functions.
- replace the Motor Module involved.
Re fault value = 6000 ... 6999:
Refer to the description of the message values in safety message C01711.

Note:
CU: Control Unit
MM: Motor Module
SGE: Safety-relevant input
SI: Safety Integrated
SMM: Safe Motion Monitoring
SS1: Safe Stop 1 (corresponds to Stop Category 1 acc. to EN60204)
STO: Safe Torque Off / SH: Safe standstill
ESR: Extended Stop and Retract

N30620 (F, A) SI MM: Safe Torque Off active
Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: The "Safe Torque Off" function was selected on the Motor Module (MM) via the input terminal and is active.
Note: This message does not result in a safety stop response.
Remedy: Not necessary.
Note: MM: Motor Module
SI: Safety Integrated
STO: Safe Torque Off / SH: Safe standstill
Reaction upon F: OFF2
Acknowled. upon F: IMMEDIATELY (POWER ON)
Reaction upon A: NONE
Acknowled. upon A: NONE

N30621 (F, A) SI MM: Safe Stop 1 active
Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: The "Safe Stop 1" function (SS1) was selected on the Motor Module (MM) and is active.
Note: This message does not result in a safety stop response.
Remedy: Not necessary.
Note: MM: Motor Module
SI: Safety Integrated
SS1: Safe Stop 1 (corresponds to Stop Category 1 acc. to EN60204)
Reaction upon F: OFF3
Acknowled. upon F: IMMEDIATELY (POWER ON)
Reaction upon A: NONE
Acknowled. upon A: NONE

F30625 SI MM: Sign-of-life error in safety data
Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF2
Acknowledge: IMMEDIATELY (POWER ON)
Cause: The "Safety Integrated" function integrated in the drive on the Motor Module (MM) has detected an error in the sign-
of-life of the safety data between the Control Unit (CU) and MM and initiated a STOP A.
- there is either a DRIVE-CLiQ communication error or communication has failed.
- a time slice overflow of the safety software has occurred.
Faults and alarms

List of faults and alarms

Fault value (r0949, decimal interpretation):
Only for internal Siemens troubleshooting.

Remedy:
- select Safe Torque Off and de-select again.
- carry out a POWER ON (power off/on) for all components.
- check whether there is a DRIVE-CLiQ communication error between the Control Unit and the Motor Module involved and, if required, carry out a diagnostics routine for the faults identified.
- de-select all drive functions that are not absolutely necessary.
- reduce the number of drives.
- check the electrical cabinet design and cable routing for EMC compliance

Note:
CU: Control Unit
MM: Motor Module
SI: Safety Integrated

F30630  SI MM: Brake control error
Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF2
Acknowledge: IMMEDIATELY (POWER ON)
Cause: The "Safety Integrated" function integrated in the drive on the Motor Module (MM) has detected a brake control error and initiated a STOP A.
- Parameter p1278 incorrectly set.
- No brake connected or wire breakage (check whether brake releases for p1278 = 1 and p9602/p9802 = 0 (SBC deactivated)).
- Ground fault in brake cable.
- Short-circuit in brake winding.
- Fault in "brake closed" state.
- Fault in the brake control circuit of the Control Unit or communication fault between the Control Unit and Motor Module (brake control).
- SafeBrakeAdapter: Fault in "brake closed" state.
- SafeBrakeAdapter: Fault in "open brake" state.
- SafeBrakeAdapter: Fault in "close brake" state.
- SafeBrakeAdapter: Fault in the brake control circuit of the Control Unit or communication fault between Control Unit and Motor Module (brake control).

Note:
The following causes may apply to fault values:
- motor cable is not shielded correctly.
- defect in control circuit of the Motor Module.

Remedy:
- check parameter p1278 (for SBC, only p1278 = 0 is permissible).
- select Safe Torque Off and de-select again.
- check the motor holding brake connection.
- check the function of the motor holding brake.
- check whether there is a DRIVE-CLiQ communication error between the Control Unit and the Motor Module involved and, if required, carry out a diagnostics routine for the faults identified.
- check that the electrical cabinet design and cable routing are in compliance with EMC regulations (e.g. shield of the motor cable and brake conductors are connected with the shield connecting plate and the motor connectors are tightly screwed to the housing).
- replace the Motor Module involved.

Operation with Safe Brake Module or Safe Brake Adapter:
- check the Safe Brake Module or Safe Brake Adapter connection.
- Replace the Safe Brake Module or Safe Brake Adapter.
### A30640 (F)

**SI MM: Fault in the shutdown path of the second channel**

**Message value:** %1  
**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
**Reaction:** NONE  
**Acknowledge:** NONE  
**Cause:** The Motor Module has detected a communication error with the higher-level control or the TM54F to transfer the safety-relevant information or there is a communication error between motor modules connected in parallel.  
**Note:** This fault results in a STOP A that can be acknowledged.  
**Fault value (r0949, decimal interpretation):** Only for internal Siemens troubleshooting.  
**Remedy:**  
- For the higher-level control, the following applies:  
  - check the PROFIsafe address in the higher-level control and Motor Modules and if required, align.  
  - save all parameters (p0977 = 1).  
  - carry out a POWER ON (power off/on) for all components.  
  - For TM54F, carry out the following steps:  
    - start the copy function for the node identifier (p9700 = 1D hex).  
    - acknowledge hardware CRC (p9701 = EC hex).  
    - save all parameters (p0977 = 1).  
    - carry out a POWER ON (power off/on) for all components.  
  For a parallel connection:  
  - check the PROFIsafe address in the Control Unit and Motor Module and if required, align.  
  - save all parameters (p0977 = 1).  
  - carry out a POWER ON (power off/on) for all components.  
  The following generally applies:  
  - upgrade the Motor Module software.  
  - For internal Siemens troubleshooting:  
    - MM: Motor Module  
    - SI: Safety Integrated  
    - See also: p9810 (SI PROFIsafe address (processor 2))  
**Reaction upon F:** NONE (OFF2)  
**Acknowl. upon F:** IMMEDIATELY (POWER ON)

### F30649

**SI MM: Internal software error**

**Message value:** %1  
**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
**Reaction:** OFF2  
**Acknowledge:** IMMEDIATELY (POWER ON)  
**Cause:** An internal error in the Safety Integrated software on the Motor Module has occurred.  
**Note:** This fault results in a STOP A that cannot be acknowledged.  
**Fault value (r0949, interpret hexadecimal):** Only for internal Siemens troubleshooting.  
**Remedy:**  
- carry out a POWER ON (power off/on) for all components.  
- re-commission the Safety Integrated function and carry out a POWER ON.  
- upgrade the Motor Module software.  
- contact the Hotline.  
- replace the Motor Module.  
**Note:**  
- MM: Motor Module  
- SI: Safety Integrated
Faults and alarms

List of faults and alarms

F30650  SI MM: Acceptance test required
Message value:  %1
Drive object:  SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction:  OFF2
Acknowledge:  IMMEDIATELY (POWER ON)
Cause:  The "Safety Integrated" function on the Motor Module requires an acceptance test.
Note:  This fault results in a STOP A that can be acknowledged.
Fault value (r0949, decimal interpretation):
130: Safety parameters for the Motor Module not available.
Note:  This fault value is always output when Safety Integrated is commissioned for the first time.
1000: Reference and actual checksum in the Motor Module are not identical (booting).
- at least one checksum-checked piece of data is defective.
2000: Reference and actual checksum on the Motor Module are not identical (commissioning mode).
- reference checksum incorrectly entered into the Motor Module (p9899 not equal to r9898).
2003: Acceptance test is required as a safety parameter has been changed.
2005: The safety logbook has identified that the safety checksums have changed. An acceptance test is required.
3003: Acceptance test is required as a hardware-related safety parameter has been changed.
9999: Subsequent response of another safety-related fault that occurred when booting that requires an acceptance test.
Remedy:  For fault value = 130:
- carry out safety commissioning routine.
For fault value = 1000:
- again carry out safety commissioning routine.
- replace the memory card or Control Unit.
For fault value = 2000:
- check the safety parameters in the Motor Module and adapt the reference checksum (p9899).
Re fault value = 2003, 2005:
- Carry out an acceptance test and generate an acceptance report.
The procedure when carrying out an acceptance test as well as an example of the acceptance report are provided in the following literature:
SINAMICS S120 Function Manual Safety Integrated
For fault value = 3003:
- carry out the function checks for the modified hardware and generate an acceptance report.
The procedure when carrying out an acceptance test as well as an example of the acceptance report are provided in the following literature:
SINAMICS S120 Function Manual Safety Integrated
For fault value = 9999:
- carry out diagnostics for the other safety-related fault that is present.
Note:  MM: Motor Module
SI: Safety Integrated
See also: p9799 (SI reference checksum SI parameters (Control Unit)), p9899 (SI setpoint checksum SI parameters (processor 2))

F30651  SI MM: Synchronization with Control Unit unsuccessful
Message value:  %1
Drive object:  SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction:  OFF2
Acknowledge:  IMMEDIATELY (POWER ON)
Cause:  The "Safety Integrated" function integrated in the drive is requesting synchronization of the safety time slices on the Control Unit and Motor Module. This synchronization routine was unsuccessful.
Note:  This fault results in a STOP A that cannot be acknowledged.
Fault value (r0949, decimal interpretation):
Only for internal Siemens troubleshooting.
Remedy:
- carry out a POWER ON (power off/on) for all components.
- upgrade the Motor Module software.
- upgrade the Control Unit software.

Note:
MM: Motor Module
SI: Safety Integrated

**F30652**  
SI MM: Illegal monitoring clock cycle

| Message value: | %1 |
| Drive object: | SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN |
| Reaction: | OFF2 |
| Acknowledge: | IMMEDIATELY (POWER ON) |
| Cause: | The Safety Integrated monitoring clock cycle cannot be maintained due to the communication conditions requested in the system. This fault results in a STOP A that cannot be acknowledged. Fault value (r0949, decimal interpretation): Only for internal Siemens troubleshooting. |

Remedy:
- if fault 1652 simultaneously occurs, apply the remedy/countermeasure described there.
- upgrade the Motor Module software.

Note:
This fault results in a STOP A that cannot be acknowledged.

**F30655**  
SI MM: Align monitoring functions

| Message value: | %1 |
| Drive object: | SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN |
| Reaction: | OFF2 |
| Acknowledge: | IMMEDIATELY (POWER ON) |
| Cause: | An error has occurred when aligning the Safety Integrated monitoring functions on the Control Unit (CU) and Motor Module (MM). Control Unit and Motor Module were not able to determine a common set of supported SI monitoring functions. - there is either a DRIVE-CLiQ communication error or communication has failed. - Safety Integrated software releases on the Control Unit and Motor Module are not compatible with one another. This fault results in a STOP A that cannot be acknowledged. Fault value (r0949, interpret hexadecimal): Only for internal Siemens troubleshooting. |

Remedy:
- carry out a POWER ON (power off/on) for all components.
- upgrade the Motor Module software.
- upgrade the Control Unit software.
- check the electrical cabinet design and cable routing for EMC compliance

Note:
This fault results in a STOP A that cannot be acknowledged.

**F30656**  
SI MM: Motor Module parameter error

| Message value: | %1 |
| Drive object: | SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN |
| Reaction: | OFF2 |
| Acknowledge: | IMMEDIATELY (POWER ON) |
| Cause: | When accessing the Safety Integrated parameters for the Motor Module (MM) in the non-volatile memory, an error has occurred. This fault results in a STOP A that can be acknowledged. |

Note:
CU: Control Unit
MM: Motor Module
Fault value (r0949, decimal interpretation):

129:
- safety parameters for the Motor Module corrupted.
- drive with enabled safety functions was possibly copied offline using the commissioning software and the project
downloaded.
131: Internal software error on the Control Unit.
255: Internal Motor Module software error.

Remedy:
- re-commission the safety functions.
- upgrade the Control Unit software.
- upgrade the Motor Module software.
- replace the memory card or Control Unit.

For fault value = 129:
- activate the safety commissioning mode (p0010 = 95).
- adapt the PROFIsafe address (p9610).
- start the copy function for SI parameters (p9700 = D0 hex).
- acknowledge data change (p9701 = DC hex).
- exit the safety commissioning mode (p0010 = 0).
- save all parameters (p0977 = 1 or "copy RAM to ROM").
- carry out a POWER ON (power off/on) for all components.

Note:
MM: Motor Module
SI: Safety Integrated

F30659 SI MM: Write request for parameter rejected

Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF2
Acknowledge: IMMEDIATELY (POWER ON)
Cause: The write request for one or several Safety Integrated parameters on the Motor Module (MM) was rejected.

Note:
This fault does not result in a safety stop response.
Fault value (r0949, decimal interpretation):
10: An attempt was made to enable the STO function although this cannot be supported.
11: An attempt was made to enable the SBC function although this cannot be supported.
13: An attempt was made to enable the SS1 function although this cannot be supported.
14: An attempt was made to enable the safe motion monitoring function with the higher-level control, although this
cannot be supported.
15: An attempt was made to enable the motion monitoring functions integrated in the drive although these cannot be
supported.
16: An attempt was made to enable the PROFIsafe communication - although this cannot be supported or the version
of the PROFIsafe driver used on the CU and MM is different.
18: An attempt was made to enable the PROFIsafe function for Basic Functions although this cannot be supported.
19: For ESR, an attempt was made to enable the delay for pulse suppression, although this cannot be supported.
See also: r9771 (SI common functions (processor 1)), r9871 (SI common functions (processor 2))

Remedy:
Re fault value = 10, 11, 13, 14, 15, 16, 18, 19:
- check whether there are faults in the safety function alignment between the Control Unit and the Motor Module
involved (F01655, F30655) and if required, carry out diagnostics for the faults involved.
- use a Motor Module that supports the required function.
- upgrade the Motor Module software.
- upgrade the Control Unit software.

Note:
CU: Control Unit
ESR: Extended Stop and Retract
MM: Motor Module
SBC: Safe Brake Control
SI: Safety Integrated
SS1: Safe Stop 1 (corresponds to Stop Category 1 acc. to EN60204)
STO: Safe Torque Off / SH: Safe standstill
### F30662  Error in internal communications

<table>
<thead>
<tr>
<th>Message value</th>
<th>%1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive object</td>
<td>All objects</td>
</tr>
<tr>
<td>Reaction</td>
<td>OFF2</td>
</tr>
<tr>
<td>Acknowledge</td>
<td>POWER ON</td>
</tr>
<tr>
<td>Cause</td>
<td>A module-internal communication error has occurred. Fault value (r0949, interpret hexadecimal): Only for internal Siemens troubleshooting.</td>
</tr>
<tr>
<td>Remedy</td>
<td>- carry out a POWER ON (power off/on). - upgrade firmware to later version. - contact the Hotline.</td>
</tr>
</tbody>
</table>

### F30664  Error while booting

<table>
<thead>
<tr>
<th>Message value</th>
<th>%1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive object</td>
<td>All objects</td>
</tr>
<tr>
<td>Reaction</td>
<td>OFF2</td>
</tr>
<tr>
<td>Acknowledge</td>
<td>POWER ON</td>
</tr>
<tr>
<td>Cause</td>
<td>An error has occurred during booting. Fault value (r0949, interpret hexadecimal): Only for internal Siemens troubleshooting.</td>
</tr>
<tr>
<td>Remedy</td>
<td>- carry out a POWER ON (power off/on). - upgrade firmware to later version. - contact the Hotline.</td>
</tr>
</tbody>
</table>

### F30665  SI MM: System is defective

<table>
<thead>
<tr>
<th>Message value</th>
<th>%1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive object</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
</tr>
<tr>
<td>Reaction</td>
<td>OFF2</td>
</tr>
<tr>
<td>Acknowledge</td>
<td>IMMEDIATELY</td>
</tr>
<tr>
<td>Cause</td>
<td>A system defect was detected before the last boot or in the actual one. The system might have been rebooted (reset). Fault value (r0949, interpret hexadecimal): 200000 hex, 400000 hex: - Fault in the actual booting/operation. 2 hex: - parameters p9500 and p9300 are not the same (if Safety message C30711 is displayed at the same time). Additional values: - defect before the last time that the system booted.</td>
</tr>
<tr>
<td>Remedy</td>
<td>- carry out a POWER ON (power off/on). - upgrade firmware to later version. - contact the Hotline. For fault value = 2: - check parameters p9500 and p9300 to see if they are the same (if Safety message C30711 is displayed at the same time). Re fault value = 400000 hex: - ensure that the Control Unit is connected to the Power Module.</td>
</tr>
</tbody>
</table>

### A30666 (F)  SI Motion MM: Steady-state (static) 1 signal at the F-DI for safety-relevant acknowledgement

<table>
<thead>
<tr>
<th>Message value</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive object</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
</tr>
<tr>
<td>Reaction</td>
<td>NONE</td>
</tr>
<tr>
<td>Acknowledge</td>
<td>NONE</td>
</tr>
<tr>
<td>Cause</td>
<td>A logical 1 signal is present at the F-DI configured in p10106 for more than 10 seconds. If, at the F-DI no acknowledgment was performed for safe acknowledgment, then a steady-state logical and 0 signal must be present. This avoids unintentional safety-relevant acknowledgement (or the &quot;Internal Event Acknowledge&quot; signal) if a wire breaks or one of the two digital inputs bounces.</td>
</tr>
</tbody>
</table>
Faults and alarms

List of faults and alarms

Remedy: Set the fail-safe digital input (F-DI) to a logical 0 signal (p10106).
Note: F-DI: Failsafe Digital Input
Reaction upon F: NONE
Acknowl. upon F: IMMEDIATELY

F30672 SI CU: Control Unit software incompatible
Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF2
Acknowledge: IMMEDIATELY (POWER ON)
Cause: The existing Control Unit software does not support the safe drive-based motion monitoring function.
Note: This fault results in a STOP A that cannot be acknowledged.
Fault value (r0949, decimal interpretation):
Only for internal Siemens troubleshooting.
Remedy: - check whether there are faults in the safety function alignment between the Control Unit and the Motor Module
(F01655, F30655) and if required, carry out diagnostics for the faults involved.
- use a Control Unit that supports the safe motion monitoring function.
- upgrade the Control Unit software.
Note: SI: Safety Integrated

F30680 SI Motion MM: Checksum error safety monitoring functions
Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF2
Acknowledge: IMMEDIATELY (POWER ON)
Cause: The actual checksum calculated by the Motor Module and entered in r9398 over the safety-relevant parameters does not match the reference checksum saved in p9399 at the last machine acceptance.
Safety-relevant parameters have been changed or a fault is present.
Note: This fault results in a STOP A that can be acknowledged.
Fault value (r0949, decimal interpretation):
0: Checksum error for SI parameters for motion monitoring,
1: Checksum error for SI parameters for component assignment.
Remedy: - check the safety-relevant parameters and if required, correct.
- set the reference checksum to the actual checksum.
- perform a POWER ON if safety parameters requiring a POWER ON have been modified.
- carry out an acceptance test.

F30681 SI Motion MM: Incorrect parameter value
Message value: Parameter: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF2
Acknowledge: IMMEDIATELY (POWER ON)
Cause: The parameter cannot be parameterized with this value.
Note: This message does not result in a safety stop response.
Fault value (r0949, decimal interpretation):
Parameter number with the incorrect value.
Remedy: Correct the parameter value.
If the encoder parameters (p9526/p9326) have different values, start the copy function for SI parameters on the drive
(p9700 = 57 hex).
Also check p9316.0 for fault value 9317.
F30682 SI Motion MM: Monitoring function not supported
Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF2
Acknowledge: IMMEDIATELY (POWER ON)
Cause: The monitoring function enabled in p9301, p9501, p9601 or p9801 is not supported in this firmware version.
Note: This message does not result in a safety stop response.
Fault value (r0949, decimal interpretation):
1: Monitoring function SLP not supported (p9301.1).
2: Monitoring function SCA not supported (p9301.7 and p9301.8 ... 15).
3: Monitoring function SLS override not supported (p9301.5).
4: Monitoring function external ESR activation not supported (p9301.4).
5: Monitoring function F-DI in PROFIsafe not supported (p9301.30).
6: Enable actual value synchronization not supported (p9301.3).
9: Monitoring function not supported, enable bit reserved (p9301.2, p9301.17 ... 29, p9301.31, if required p9301.6).
12: This Control Unit does not support NcSI.
24: Monitoring function SDI not supported.
26: hysteresis and filtering for SSM monitoring function without an encoder not supported (p9301.16).
30: The firmware version of the Motor Module is older than the version of the Control Unit.
Remedy: - de-select the monitoring function involved (p9301, p9301, p9303, p9601, p9801).
- Upgrade the Motor Module firmware.
Note:
ESR: Extended Stop and Retract
SCA: Safe Cam / SN: Safe software cam
SDI: Safe Direction (safe motion direction)
SI: Safety Integrated
SLP: Safely-Limited Position / SE: Safe software limit switches
SLS: Safely-Limited Speed / SG: Safely reduced speed
See also: p9301, p9501, p9503, p9601, p9801, r9871

F30683 SI Motion MM: SOS/SLS enable missing
Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF2
Acknowledge: IMMEDIATELY (POWER ON)
Cause: The safety-relevant basic function "SOS/SLS" is not enabled in p9301 although other safety-relevant monitoring functions are enabled.
Note: This message does not result in a safety stop response.
Remedy: Enable the function "SOS/SLS" (p9301.0).
Note:
SI: Safety Integrated
SLS: Safely-Limited Speed / SG: Safely reduced speed
SOS: Safe Operating Stop / SBH: Safe operating stop
See also: p9301 (SI Motion enable safety functions (processor 2))

F30685 SI Motion MM: Safely-Limited Speed limit value too high
Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF2
Acknowledge: IMMEDIATELY (POWER ON)
Cause: The limit value for the function "Safely-Limited Speed" (SLS) is greater than the speed that corresponds to an encoder limit frequency of 500 kHz.
Note: This message does not result in a safety stop response.
Fault value (r0949, decimal interpretation):
Maximum permissible speed.
### Faults and alarms

#### List of faults and alarms

**Remedy:** Correct the limit values for SLS and carry out a POWER ON.

**Note:**
- SI: Safety Integrated
- SLS: Safely-Limited Speed / SG: Safely reduced speed
- See also: p9331 (SI Motion SLS limit values (processor 2))

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**F30688**

**SI Motion MM: Actual value synchronization not permissible**

**Message value:** -

**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

**Reaction:** OFF2

**Acknowledge:** IMMEDIATELY (POWER ON)

**Cause:**
- It is not permissible to enable actual value synchronization for a 1-encoder system.
- It is not permissible to simultaneously enable actual value synchronization and a monitoring function with absolute reference (SCA/SLP).

**Note:**
- This fault results in a STOP A that cannot be acknowledged.

**Remedy:**
- Either select the "actual value synchronization" function or parameterize a 2-encoder system.
- Either de-select the function "actual value synchronization" or the monitoring functions with absolute reference (SCA/SLP) and carry out a POWER ON.

**Note:**
- SCA: Safe Cam / SN: Safe software cam
- SI: Safety Integrated
- SLP: Safely-Limited Position / SE: Safe software limit switches
- See also: p9301 (SI Motion enable safety functions (processor 2))

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**F30692**

**SI Motion MM: Incorrect parameter value encoderless**

**Message value:** Parameter: %1

**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

**Reaction:** OFF2

**Acknowledge:** IMMEDIATELY (POWER ON)

**Cause:**
- The parameter cannot be parameterized with this value if encoderless motion monitoring functions have been parameterized in p9306.

**Note:**
- This message does not result in a safety stop response.
- Fault value (r0949, decimal interpretation):
- Parameter number with the incorrect value.
- See also: p9301 (SI Motion enable safety functions (processor 2))

**Remedy:**
- Correct the parameter value or de-select encoderless motion monitoring functions.

**Note:**
- See also: p9301 (SI Motion enable safety functions (processor 2)), p9501 (SI Motion enable safety functions (processor 1))

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**A30693 (F)**

**SI MM: Safety parameter settings changed, warm restart/POWER ON required**

**Message value:** %1

**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:**
- Safety parameters have been changed; these will only take effect following a warm restart or POWER ON.
- Alarm value (r2124, interpret decimal):
- Parameter number of the safety parameter which has changed, necessitating a warm restart or POWER ON.

**Remedy:**
- carry out a warm restart (p0009 = 30, p0976 = 2, 3).
- carry out a POWER ON (power off/on) for all components.

**Note:**
- Before performing an acceptance test, a POWER ON must be carried out for all components.

**Reaction upon F:** NONE (OFF1, OFF2, OFF3)

**Acknowl. upon F:** POWER ON
### List of faults and alarms

#### C30700 SI Motion MM: STOP A initiated

**Message value:** -  
**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
**Reaction:** OFF2  
**Acknowledge:** IMMEDIATELY (POWER ON)  
**Cause:** The drive is stopped via a STOP A (pulses are suppressed via the safety shutdown path of the Control Unit). Possible causes:  
- stop request from the Control Unit.  
- pulses not suppressed after a parameterized time (p9357) after test stop selection.  
- subsequent response to the message C30706 "SI Motion MM: SAM/SBR limit exceeded".  
- subsequent response to the message C30714 "SI Motion MM: Safely-Limited Speed exceeded".  
- subsequent response to the message C30701 "SI Motion MM: STOP B initiated".  
**Remedy:**  
- remove the cause to the fault on the Control Unit.  
- check the value in p9357, if required, increase the value.  
- check the shutdown path of the Control Unit (check DRIVE-CLiQ communication).  
- carry out a diagnostics routine for message C30706.  
- carry out a diagnostics routine for message C30714.  
- replace the Motor Module/Power Module  
- replace Control Unit.  
This message can only be acknowledged via the Terminal Module 54F (TM54F) or PROFIsafe.  
**Note:**  
SAM: Safe Acceleration Monitor (safe acceleration monitoring)  
SBR: Safe Brake Ramp (safe brake ramp monitoring)  
SI: Safety Integrated

#### C30701 SI Motion MM: STOP B initiated

**Message value:** -  
**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
**Reaction:** OFF3  
**Acknowledge:** IMMEDIATELY (POWER ON)  
**Cause:** The drive is stopped via a STOP B (braking along the OFF3 ramp). As a result of this fault, after the time parameterized in p9356 has expired or after the speed threshold parameterized in p9360 has been fallen below, message C30700 "SI Motion MM: STOP A initiated" is output. Possible causes:  
- stop request from the Control Unit.  
- subsequent response to the message C30714 "SI Motion MM: Safely-Limited Speed exceeded".  
- subsequent response to the message C30711 "SI Motion MM: Defect in a monitoring channel".  
- subsequent response to the message C30707 "SI Motion MM: tolerance for safe operating stop exceeded".  
**Remedy:**  
- remove the cause to the fault on the Control Unit.  
- carry out a diagnostics routine for message C30714.  
- carry out a diagnostics routine for message C30711.  
- carry out a diagnostics routine for message C30707.  
This message can only be acknowledged via the Terminal Module 54F (TM54F) or PROFIsafe.  
**Note:**  
SI: Safety Integrated

#### C30706 SI Motion MM: SAM/SBR limit exceeded

**Message value:** -  
**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
**Reaction:** NONE  
**Acknowledge:** IMMEDIATELY (POWER ON)  
**Cause:** Motion monitoring functions with encoder (p9306 = 0) or encoderless with set acceleration monitoring (p9306 = 3):  
- SAM - safe acceleration monitoring. After initiating STOP B (SS1) or STOP C (SS2), the speed has exceeded the selected tolerance.
Motion monitoring functions encoderless with set brake ramp monitoring (p9306 = 1):
SBR - Safe brake ramp monitoring. After initiating STOP B (SS1) or SLS changeover to the lower speed stage, the speed has exceeded the selected tolerance.
- via F-DI or PROFlsafe.
The drive is shut down by the message C30700 "SI Motion MM: STOP A initiated".
Remedy:
Check the braking behavior and, if necessary, adapt the tolerance for the "SAM" function or modify the parameter settings for the "SBR" function.
This message can be acknowledged without a POWER ON as follows:
- motion monitoring functions integrated in the drive: via Terminal Module 54F (TM54F) or PROFlsafe
Note:
SAM: Safe Acceleration Monitor (safe acceleration monitoring)
SBR: Safe Brake Ramp (safe ramp monitoring)
SI: Safety Integrated
See also: p9348, p9381, p9382, p9383, p9548

C30707 SI Motion MM: Tolerance for safe operating stop exceeded
Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: IMMEDIATELY (POWER ON)
Cause: The actual position has distanced itself further from the target position than the standstill tolerance.
The drive is shut down by the message C30701 "SI Motion MM: STOP B initiated".
Remedy:
- check whether safety faults are present and if required carry out the appropriate diagnostic routines for the partic-
ular faults.
- check whether the standstill tolerance matches the accuracy and control dynamic performance of the axis.
This message can only be acknowledged via the Terminal Module 54F (TM54F) or PROFlsafe.
Note:
SI: Safety Integrated
SOS: Safe Operating Stop / SBH: Safe operating stop
See also: p9530 (SI Motion standstill tolerance (processor 1))

C30708 SI Motion MM: STOP C initiated
Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: STOP2
Acknowledge: IMMEDIATELY (POWER ON)
Cause: The drive is stopped via a STOP C (braking along the OFF3 ramp).
"Safe Operating Stop" (SOS) is activated after the parameterized timer has expired.
Possible causes:
- stop request from the higher-level control.
- subsequent response to the message C30714 "SI Motion MM: Safely-Limited Speed exceeded".
See also: p9552 (SI Motion transition time STOP C to SOS (processor 1))
Remedy:
- remove the cause of the fault at the control.
- carry out a diagnostics routine for message C30714.
This message can only be acknowledged via the Terminal Module 54F (TM54F) or PROFlsafe.
Note:
SI: Safety Integrated
SOS: Safe Operating Stop / SBH: Safe operating stop
See also: p9552 (SI Motion transition time STOP C to SOS (processor 1))

C30709 SI Motion MM: STOP D initiated
Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: IMMEDIATELY (POWER ON)
Cause: The drive is stopped via a STOP D (braking along the path).
"Safe Operating Stop" (SOS) is activated after the parameterized timer has expired.
Possible causes:
- stop request from the Control Unit.
- subsequent response to the message C30714 "SI Motion: Safely limited speed exceeded".
See also: p9354 (SI Motion transition time STOP E to SOS (processor 2)), p9554 (SI Motion transition time STOP E to SOS (processor 1))

Remedy:
- remove the cause of the fault at the control.
- carry out a diagnostics routine for message C30714.
This message can only be acknowledged via the Terminal Module 54F (TM54F) or PROFIsafe.
Note:
SI: Safety Integrated
SOS: Safe Operating Stop / SBH: Safe operating stop

C30710  SI Motion MM: STOP E initiated
Message value: 
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: IMMEDIATELY (POWER ON)
Cause: The drive is stopped via a STOP E (retraction motion).
"Safe Operating Stop" (SOS) is activated after the parameterized timer has expired.
Possible causes:
- stop request from the higher-level control.
- subsequent response to the message C30714 "SI Motion: Safely limited speed exceeded".
See also: p9354 (SI Motion transition time STOP E to SOS (processor 2)), p9554 (SI Motion transition time STOP E to SOS (processor 1))

Remedy:
- remove the cause of the fault at the control.
- carry out a diagnostics routine for message C30714.
This message can only be acknowledged via the Terminal Module 54F (TM54F) or PROFIsafe.
Note:
SI: Safety Integrated
SOS: Safe Operating Stop / SBH: Safe operating stop

C30711  SI Motion MM: Defect in a monitoring channel
Message value: 1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: IMMEDIATELY (POWER ON)
Cause: When cross-checking and comparing the two monitoring channels, the drive detected a difference between the input data or results of the monitoring functions and initiated a STOP F. One of the monitoring functions no longer reliably functions - i.e. safe operation is no longer possible.
If at least one monitoring function is active, then after the parameterized timer has expired, the message C30701 "SI Motion: STOP B initiated" is output. The message is output with message value 1031 when the Sensor Module hardware is replaced.
The following message values may also occur in the following cases if the cause that is explicitly mentioned does not apply:
- differently parameterized cycle times (p9500/p9300, p9511/p9311).
- differently parameterized axis types (p9502/p9302).
- excessively fast cycle times (p9500/p9300, p9511/p9311).
- incorrect synchronization.
Message value (r9749, interpret decimal):
0 ... 999: Number of the cross-checked data that resulted in this message. Refer to safety message C01711 for a description of the individual data.
The significance of the individual message values is described in safety message C01711 of the Control Unit.
1000: Watchdog timer has expired. Too many signal changes have occurred at safety-relevant inputs.
1001: Initialization error of watchdog timer.
1005: Pulses already suppressed for test stop selection.
1011: Acceptance test status between the monitoring channels differ.
1012: Plausibility violation of the actual value from the encoder.
1020: Cyc. communication failure between the monit. cycles.
1021: Cyc. communication failure between the monit. channel and Sensor Module.
1023: Error in the effectiveness test in the DRIVE-CLiQ encoder
1030: Encoder fault detected from another monitoring channel.
Faults and alarms

List of faults and alarms

1031: Data transfer error between the monitoring channel and the Sensor Module (p9526/p9326).
1040: Pulses suppressed with active encoderless monitoring functions.
1041: Current absolute value too low (encoderless)
1042: Current/voltage plausibility error
1043: Too many acceleration phases
1044: Actual current values plausibility error.
5000 ... 5140: PROFIsafe message values. For these fault values, the failsafe control signals (failsafe values) are transferred to the safety functions. The significance of the individual message values is described in safety message C01711 of the Control Unit. 6000 ... 6166: PROFIsafe message values (PROFIsafe driver for PROFIBUS DP V1/V2 and PROFINET). For these fault values, the failsafe control signals (failsafe values) are transferred to the safety functions. The significance of the individual message values is described in safety message C01711 of the Control Unit. See also: p9555 (SI Motion transition time STOP F to STOP B (processor 1)), r9725 (SI Motion, diagnostics STOP F)

Remedy:
Re message value = 1030:
- check the encoder connection.
- if required, replace the encoder.
Re message value = 1031:
When replacing a Sensor Module, carry out the following steps:
- start the copy function for the node identifier on the drive (p9700 = 1D hex).
- acknowledge the hardware CRC on the drive (p9701 = EC hex).
- save all parameters (p0977 = 1).
- carry out a POWER ON (power off/on) for all components.
The following always applies:
- check the encoder connection.
- if required, replace the encoder.
Re message value = 1040:
- de-select encoderless monitoring functions, select and de-select STO.
- if monitoring function is active, issue "SLS" pulse enable within 5 s of de-selecting STO.
Re other message values:
- The significance of the individual message values is described in safety message C01711 of the Control Unit.
Note:
This message can only be acknowledged via the Terminal Module 54F (TM54F) or PROFIsafe.
See also: p9300 (SI Motion monitoring clock cycle (processor 2)), p9500 (SI Motion monitoring clock cycle (processor 1))

C30712 SI Motion MM: Defect in F-IO processing

Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: IMMEDIATELY (POWER ON)
Cause:
When cross checking and comparing the two monitoring channels, the drive detected a difference between parameters or results of the F-IO processing and initiated a STOP F. One of the monitoring functions no longer reliably functions - i.e. safe operation is no longer possible. The safety message C30711 with message value 0 is also displayed due to initiation of STOP F. If at least one monitoring function is active, the safety message C30701 "SI Motion: STOP B initiated" is output after the parameterized timer has expired.
Message value (r9749, interpret decimal):
Number of the cross-checked data that resulted in this message.
Refer to the description of the message values in safety message C01712.
Remedy:
- check parameterization in the parameters involved and correct if required.
- ensure equality by copying the SI data to the second channel and then carry out an acceptance test.
- check monitoring clock cycle for equality (p9850, p9300).
Note:
This message can be acknowledged via F-DI or PROFIsafe.
See also: p9300 (SI Motion monitoring clock cycle (processor 2)), p9500 (SI Motion monitoring clock cycle (processor 1))
### List of faults and alarms

#### C30714
**SI Motion MM: Safely-Limited Speed exceeded**

<table>
<thead>
<tr>
<th>Message value:</th>
<th>%1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive object:</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
</tr>
<tr>
<td>Reaction:</td>
<td>NONE</td>
</tr>
<tr>
<td>Acknowledge:</td>
<td>IMMEDIATELY (POWER ON)</td>
</tr>
<tr>
<td>Cause:</td>
<td>The drive had moved faster than that specified by the velocity limit value (p9331). The drive is stopped as a result of the configured stop response (p9363). Message value (r9749, interpret decimal): 100: SLS1 exceeded. 200: SLS2 exceeded. 300: SLS3 exceeded. 400: SLS4 exceeded. 1000: Encoder limit frequency exceeded.</td>
</tr>
<tr>
<td>Remedy:</td>
<td>- check the traversing/motion program in the control. - check the limits for &quot;SLS&quot; function and if required, adapt (p9331).</td>
</tr>
<tr>
<td>Note:</td>
<td>This message can only be acknowledged via the Terminal Module 54F (TM54F) or PROFIsafe. SI: Safety Integrated SLS: Safely-Limited Speed / SG: Safely reduced speed See also: p9331 (SI Motion SLS limit values (processor 2)), p9363 (SI Motion SLS stop response (processor 2))</td>
</tr>
</tbody>
</table>

#### C30716
**SI Motion MM: Tolerance for safe motion direction exceeded**

<table>
<thead>
<tr>
<th>Message value:</th>
<th>%1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive object:</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
</tr>
<tr>
<td>Reaction:</td>
<td>NONE</td>
</tr>
<tr>
<td>Acknowledge:</td>
<td>IMMEDIATELY (POWER ON)</td>
</tr>
<tr>
<td>Cause:</td>
<td>The tolerance for the &quot;safe motion direction&quot; function was exceeded. The drive is stopped as a result of the configured stop response (p9366). Message value (r9749, interpret decimal): 0: Tolerance for the &quot;safe motion direction positive&quot; function exceeded. 1: Tolerance for the &quot;safe motion direction positive negative&quot; function exceeded.</td>
</tr>
<tr>
<td>Remedy:</td>
<td>- check the traversing/motion program in the control. - check the tolerance for &quot;SDI&quot; function and if required, adapt (p9364).</td>
</tr>
<tr>
<td>Note:</td>
<td>This message can be acknowledged as follows: Via F-DI or PROFIsafe SDI: Safe Direction (safe motion direction) SI: Safety Integrated See also: p9364 (SI Motion SDI tolerance (processor 2)), p9365 (SI Motion SDI delay time (processor 2)), p9366 (SI Motion SDI stop response (processor 2))</td>
</tr>
</tbody>
</table>

#### C30770
**SI Motion MM: Discrepancy error affecting the fail-safe inputs/outputs**

<table>
<thead>
<tr>
<th>Message value:</th>
<th>%1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive object:</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
</tr>
<tr>
<td>Reaction:</td>
<td>NONE</td>
</tr>
<tr>
<td>Acknowledge:</td>
<td>IMMEDIATELY (POWER ON)</td>
</tr>
<tr>
<td>Cause:</td>
<td>The fail-safe digital inputs/digital outputs (F-DI/F-DO) show a different state longer than that parameterized in p10002 / p10102. Fault value (r0949, interpret hexadecimal): yyyyxxxx hex xxxx: Discrepancy error for fail-safe digital inputs (F-DI). Bit 0: Discrepancy error for F-DI 0 Bit 1: Discrepancy error for F-DI 1 ... yyyy: Discrepancy error for fail-safe digital outputs (F-DO). Bit 0: Discrepancy error for F-DO 0 Bit 1: Discrepancy error for F-DO 1 ...</td>
</tr>
<tr>
<td>Note:</td>
<td>If several discrepancy errors occur consecutively, then this fault is only signaled for the first error that occurs.</td>
</tr>
</tbody>
</table>
Faults and alarms

Remedy:
- check the wiring of the F-DI (contact problems).
Note:
This message can be acknowledged via F-DI or PROFIsafe.
Discrepancy errors of an F-DI can only be completely acknowledged if safe acknowledgement was carried out once the cause of the error was resolved (p10006 or acknowledgment via PROFIsafe). As long as safety acknowledge-
ment was not carried out, the corresponding F-DI stays in the safe state internally.
For cyclic switching operations at the F-DI, it may be necessary to adapt the discrepancy time to the switching fre-
quency.
If the period of a cyclic switching pulse has the order of magnitude of double the value of p10002, then the following formulas must be checked.
p10002 \( \leq \) (tp / 2) - td (discrepancy time must be less than half the period minus the actual discrepancy time)
p10002 \( \geq \) p9500 (discrepancy time must be no less than P9500)
p10002 > td (discrepancy time must be greater than the switch discrepancy time which may actually apply)
td = possible actual discrepancy time (in ms) that can occur with a switching operation. This must correspond to at least 1 SI sampling cycle (see p9500).

Example:
For a 12 ms SI sampling cycle and a switching frequency of 110 ms (p10017 = 0), the maximum discrepancy time which can be set is as follows:
p10002 \( \leq \) (110/2 ms) - 12 ms = 43 ms
Rounded-off, p10002 <= 36 ms is obtained (since the discrepancy time can only be accepted as a whole SI sampling cycle, the value will need to be rounded up or down to a whole SI sampling time value if the result is not an exact multiple of an SI sampling cycle).

Note:
F-DI: Failsafe Digital Input
F-DO: Failsafe Digital Output

A30772
SI Motion MM: Test stop failsafe inputs/outputs active

Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: The test stop for the fail-safe digital inputs (F-DI) and/or fail-safe digital outputs (F-DO) is presently being performed.
Note:
F-DI: Failsafe Digital Input
F-DO: Failsafe Digital Output
Remedy: The alarm disappears automatically after successfully ending or canceling (when a fault condition occurs) the test stop.

F30773
SI Motion MM: Test stop fault Motor Module

Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: IMMEDIATELY (POWER ON)
Cause: A fault has occurred on the MM side during the test stop for the fail-safe outputs.
Fault value (r0949, interpret hexadecimal):
RRRWWXYZ hex:
R: Reserved.
V: Actual state of the DO channel concerned (see X) on the CU (corresponds to the states read back from the hard-
ware, bit 0 = DO 0, bit 1 = DO 1, etc.).
W: Required state of the DO channel concerned (see X, bit 0 = DO 0, bit 1 = DO 1, etc.).
X: DO channels involved, which indicate an error (bit 0 = DO 0, bit 1 = DO 1, etc.).
Y: Reason for the test stop fault.
Z: State of the test stop in which the fault has occurred.
Y: Reason for the test stop fault
Y = 1: MM side in incorrect test stop state (internal fault).
Y = 2: Expected states of the DOs were not fulfilled (CU305: readback via DI 22 / CU240 readback DI 2).
Y = 3: Incorrect timer state on CU side (internal fault)
Y = 4: Expected states of the diag DOs were not fulfilled (CU305: internal readback on MM channel).
Y = 5: Expected states of the second diag DOs were not fulfilled (CU305: internal readback on CU channel).
X and V indicate the DI or Diag-DO state dependent upon the reason for the fault (2, 4 or 5).
In the event of multiple test stop faults, the first one that occurred is shown.
Z: Test stop state and associated test actions
Z = 0 ... 3: Synchronization phase of test stop between CU and Motor Module no switching operations
Z = 4: DO + OFF and DO - OFF
Z = 5: Check to see if states are as expected
Z = 6: DO + ON and DO - ON
Z = 7: Check to see if states are as expected
Z = 8: DO + OFF and DO - ON
Z = 9: Check to see if states are as expected
Z = 10: DO + ON and DO - OFF
Z = 11: Check to see if states are as expected
Z = 12: DO + OFF and DO - OFF
Z = 13: Check to see if states are as expected
Z = 14: End of test stop

Diag expected states in table format:
Test stop state: Expectation Mode 1 / Mode 2 / Mode 3 / Mode 4
5: 0/-/-/1
7: 0/-/-/0
9: 0/-/-/0
11: 1/-/-/1
13: 0/-/-/1
Second diag expected states in table format:
Test stop state: Expectation Mode 1 / Mode 2 / Mode 3 / Mode 4
5: -/-/-/1
7: -/-/-/0
9: -/-/-/1
11: -/-/-/0
13: -/-/-/1

DI expected states in table format:
Test stop state: Expectation Mode 1 / Mode 2 / Mode 3 / Mode 4
5: -/1/1/-
7: -/0/0/-
9: -/0/1/-
11: -/0/1/-
13: -/1/1/-

Example:
Fault F01773 (CU) is signaled with fault value = 0001_0127 and fault F30773 (MM) is signaled with fault value 0000_0127.
This means that in state 7 (Z = 7) the state of the external readback signal was not set correctly (Y = 2) after DO-0 (X = 1) was switched to ON/ON.
Fault value 0001_0127 indicates that 0 was expected (W = 0) and 1 (V = 1) was read back from the hardware.
Fault value 0000_0127 on the MM indicates that the states were as expected.
In the case of fault F30773, W and V are always identical; a value of 0 always means that 0 was expected at the readback input but was not present on the other channel (CU).

Remedy:
Check the wiring of the F-DOs and restart the test stop.

Note:
The fault is withdrawn if the test stop is successfully completed.
In the event of multiple test stop faults, the first one that occurred is shown.
Once the test stop has been restarted the next queued test stop fault will be signaled (if there is one).

C30798 SI Motion MM: Test stop running
Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: IMMEDIATELY (POWER ON)
Cause: The test stop is active.
## Faults and alarms

### List of faults and alarms

<table>
<thead>
<tr>
<th>Fault ID</th>
<th>Description</th>
<th>Message Value</th>
<th>Drive Object</th>
<th>Reaction</th>
<th>Acknowledge</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>C30799</td>
<td>SI Motion MM: Acceptance test mode active</td>
<td>-</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>NONE</td>
<td>IMMEDIATELY (POWER ON)</td>
<td>The acceptance test mode is active. The POWER ON signals of the safety-relevant motion monitoring functions can be acknowledged during the acceptance test using the acknowledgement functions of the higher-level control.</td>
<td>Note: SI: Safety Integrated</td>
</tr>
<tr>
<td>N30800 (F)</td>
<td>Power unit: Group signal</td>
<td>-</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>OFF2</td>
<td>NONE</td>
<td>The power unit has detected at least one fault.</td>
<td>Remedy: Evaluate the other messages that are presently available.</td>
</tr>
</tbody>
</table>
| F30801   | Power unit DRIVE-CLiQ: Sign-of-life missing | Component number: %1, fault cause: %2 | SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN | OFF2     | IMMEDIATELY | A DRIVE-CLiQ communication error has occurred from the Control Unit to the power unit concerned. The computing time load might be too high. Fault value (r0949, interpret hexadecimal):
- yyxx hex: yy = component number, xx = fault cause
- xx = 0A hex: The sign-of-life bit in the receive telegram is not set. | Remedy: - check the electrical cabinet design and cable routing for EMC compliance - remove DRIVE-CLiQ components that are not required. - de-select functions that are not required. - if required, increase the sampling times (p0112, p0115). - replace the component involved. |
| F30802   | Power unit: Time slice overflow | -             | SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN | OFF2     | IMMEDIATELY | A time slice overflow has occurred. | Remedy: - carry out a POWER ON (power off/on) for all components. - upgrade firmware to later version. - contact the Hotline. |
### A30804 (F) Power unit: CRC

**Message value:** %1

**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:** CRC error actuator

**Remedy:**
- carry out a POWER ON (power off/on) for all components.
- upgrade firmware to later version.
- contact the Hotline.

**Reaction upon F:** OFF2 (OFF1, OFF3)

**Acknowl. upon F:** IMMEDIATELY

### F30805 Power unit: EPROM checksum error

**Message value:** %1

**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

**Reaction:** OFF2

**Acknowledge:** IMMEDIATELY

**Cause:** Internal parameter data is corrupted.

- Fault value (r0949, interpret hexadecimal):
  - 01: EEPROM access error.
  - 02: Too many blocks in the EEPROM.

**Remedy:**
- Replace the module.

### F30809 Power unit: Switching information not valid

**Message value:** -

**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

**Reaction:** OFF2

**Acknowledge:** IMMEDIATELY

**Cause:** For 3P gating unit:

- The last switching status word in the setpoint telegram is identified by the end ID. Such an end ID was not found.

**Remedy:**
- carry out a POWER ON (power off/on) for all components.
- upgrade firmware to later version.
- contact the Hotline.

### A30810 (F) Power unit: Watchdog timer

**Message value:** -

**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:** When booting it was detected that the cause of the previous reset was an SAC watchdog timer overflow.

**Remedy:**
- carry out a POWER ON (power off/on) for all components.
- upgrade firmware to later version.
- contact the Hotline.

**Reaction upon F:** NONE (OFF2)

**Acknowl. upon F:** IMMEDIATELY

### F30850 Power unit: Internal software error

**Message value:** %1

**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

**Reaction:** OFF1 (NONE, OFF2, OFF3)

**Acknowledge:** POWER ON

**Cause:** An internal software error has occurred in the power unit.

- Fault value (r0949, decimal interpretation):
  - Only for internal Siemens troubleshooting.
Remedy:  
- replace power unit.  
- if required, upgrade the firmware in the power unit.  
- contact the Hotline.

**F30899 (N, A)**  
**Power unit: Unknown fault**

**Message value:** New message: %1  
**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
**Reaction:** NONE (IASC/DCBRAKE, OFF1, OFF2, OFF3, STOP1, STOP2)  
**Acknowledge:** IMMEDIATELY (POWER ON)  
**Cause:** A fault occurred on the power unit that cannot be interpreted by the Control Unit firmware.  
This can occur if the firmware on this component is more recent than the firmware on the Control Unit.  
Fault value (r0949, decimal interpretation):  
Fault number.  
Note:  
If required, the significance of this new fault can be read about in a more recent description of the Control Unit.  

**Remedy:**  
- replace the firmware on the power unit by an older firmware version (r0128).  
- upgrade the firmware on the Control Unit (r0018).

**F30903**  
**Power unit: I2C bus error occurred**

**Message value:** %1  
**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
**Reaction:** NONE (IASC/DCBRAKE, OFF1, OFF2, OFF3, STOP1, STOP2)  
**Acknowledge:** IMMEDIATELY  
**Cause:** Communications error with an EEPROM or A/D converter.  
Fault value (r0949, interpret hexadecimal):  
80000000 hex:  
- internal software error.  
00000001 hex ... 0000FFFF hex:  
- module fault.

**Remedy:**  
Re fault value = 80000000 hex:  
- upgrade firmware to later version.  
Re fault value = 00000001 hex ... 0000FFFF hex:  
- replace the module.

**F30907**  
**Power unit: FPGA configuration unsuccessful**

**Message value:** -  
**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
**Reaction:** OFF2 (IASC/DCBRAKE, NONE, OFF1, OFF3, STOP1, STOP2)  
**Acknowledge:** IMMEDIATELY  
**Cause:** During initialization within the power unit, an internal software error has occurred.

**Remedy:**  
- if required, upgrade the firmware in the power unit.  
- replace power unit.  
- contact the Hotline.

**A30920 (F)**  
**Power unit: Temperature sensor fault**

**Message value:** %1  
**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
**Reaction:** NONE  
**Acknowledge:** NONE  
**Cause:** When evaluating the temperature sensor, an error occurred.  
Alarm value (r2124, interpret decimal):  
1: Wire breakage or sensor not connected (KTY: R > 1630 Ohm, PT100: R > 375 Ohm).  
2: Measured resistance too low (PTC: R < 20 Ohm, KTY: R < 50 Ohm, PT100: R < 30 Ohm).
Remedy: - make sure that the sensor is connected correctly.  
- replace the sensor.

Reaction upon F: NONE (IASC/DCBRAKE, OFF1, OFF2, OFF3, STOP1, STOP2)

Acknowl. upon F: IMMEDIATELY

---

**A30999 (F, N)** Power unit: Unknown alarm

**Message value:** New message: %1

**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:** An alarm occurred on the power unit that cannot be interpreted by the Control Unit firmware. This can occur if the firmware on this component is more recent than the firmware on the Control Unit.

Alarm value (r2124, interpret decimal):
- Alarm number.

Note: If required, the significance of this new alarm can be read about in a more recent description of the Control Unit.

**Remedy:**
- replace the firmware on the power unit by an older firmware version (r0128).
- upgrade the firmware on the Control Unit (r0018).

Reaction upon F: NONE (IASC/DCBRAKE, OFF1, OFF2, OFF3, STOP1, STOP2)

Acknowl. upon F: IMMEDIATELY (POWER ON)

Reaction upon N: NONE

Acknowl. upon N: NONE

---

**F31100 (N, A)** Encoder 1: Zero mark distance error

**Message value:** %1

**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

**Reaction:** ENCODER (IASC/DCBRAKE, OFF1, OFF2, OFF3, STOP1, STOP2)

**Acknowledge:** PULSE INHIBIT

**Cause:** The measured zero mark distance does not correspond to the parameterized zero mark distance. For distance-coded encoders, the zero mark distance is determined from zero marks detected pairs. This means that if a zero mark is missing, depending on the pair generation, this cannot result in a fault and also has no effect in the system. The zero mark distance for the zero mark monitoring is set in p0425 (rotary encoder) or p0424 (linear encoder).

Fault value (r0949, decimal interpretation):
- Last measured zero mark distance in increments (4 increments = 1 encoder pulse).
- The sign designates the direction of motion when detecting the zero mark distance.

See also: p0491 (Motor encoder fault response ENCODER)

**Remedy:**
- check that the encoder cables are routed in compliance with EMC.
- check the plug connections
- check the encoder type (encoder with equidistant zero marks).
- adapt the parameter for the distance between zero marks (p0424, p0425).
- if message output above speed threshold, reduce filter time if necessary (p0438).
- replace the encoder or encoder cable

Reaction upon N: NONE

Acknowl. upon N: NONE

Reaction upon A: NONE

Acknowl. upon A: NONE

---

**F31101 (N, A)** Encoder 1: Zero mark failed

**Message value:** %1

**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

**Reaction:** ENCODER (IASC/DCBRAKE, NONE, OFF1, OFF2, OFF3, STOP1, STOP2)

**Acknowledge:** PULSE INHIBIT

**Cause:** The 1.5 x parameterized zero mark distance was exceeded.

The zero mark distance for the zero mark monitoring is set in p0425 (rotary encoder) or p0424 (linear encoder).
Fault value (r0949, decimal interpretation):
Number of increments after POWER ON or since the last zero mark that was detected (4 increments = 1 encoder pulse).
See also: p0491 (Motor encoder fault response ENCODER)

Remedy:
- check that the encoder cables are routed in compliance with EMC.
- check the plug connections
- check the encoder type (encoder with equidistant zero marks).
- adapt the parameter for the clearance between zero marks (p0425).
- if message output above speed threshold, reduce filter time if necessary (p0438).
- when p0437.1 is active, check p4686.
- replace the encoder or encoder cable

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F31103 (N, A) Encoder 1: Amplitude error, track R
Message value: R track: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: ENCODER (IASC/DCBRAKE, NONE)
Acknowledge: PULSE INHIBIT
Cause:
The amplitude of the reference track signal (track R) does not lie within the tolerance bandwidth for encoder 1. The fault can be initiated when the unipolar voltage level is exceeded (RP/RN) or if the differential amplitude is undershot.
Fault value (r0949, interpret hexadecimal):
yyyyyxxx hex: yyyy = 0, xxxx = Signal level, track R (16 bits with sign)
The response thresholds of the unipolar signal levels of the encoder are between < 1400 mV and > 3500 mV.
The response threshold for the differential signal level of the encoder is < -1600 mV.
A signal level of 500 mV peak value corresponds to the numerical value 5333 hex = 21299 dec.
Note:
The analog value of the amplitude error is not measured at the same time with the hardware fault output by the Sensor Module. The fault value can only be represented between -32767 ... 32767 dec (-770 ... 770 mV).
The signal level is not evaluated unless the following conditions are satisfied:
- Sensor Module properties available (r0459.31 = 1).
- Monitoring active (p0437.31 = 1).
See also: p0491 (Motor encoder fault response ENCODER)
Remedy:
- check the speed range; frequency characteristic (amplitude characteristic) of the measuring equipment might not be sufficient for the speed range
- check that the encoder cables and shielding are routed in compliance with EMC.
- check the plug connections and contacts of the encoder cable.
- check whether the zero mark is connected and the signal cables RP and RN have been connected correctly
- replace the encoder cable.
- if the coding disk is soiled or the lighting aged, replace the encoder.

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F31110 (N, A) Encoder 1: Serial communications error
Message value: Fault cause: %1 bin
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: ENCODER (IASC/DCBRAKE, NONE)
Acknowledge: PULSE INHIBIT
Cause:
Serial communication protocol transfer error between the encoder and evaluation module.
Fault value (r0949, interpret binary):
Bit 0: Alarm bit in the position protocol.
Bit 1: Incorrect quiescent level on the data line.
Bit 2: Encoder does not respond (does not supply a start bit within 50 ms).
List of faults and alarms

Bit 3: CRC error: The checksum in the protocol from the encoder does not match the data.
Bit 4: Encoder acknowledgement error: The encoder incorrectly understood the task (request) or cannot execute it.
Bit 5: Internal error in the serial driver: An illegal mode command was requested.
Bit 6: Timeout when cyclically reading.
Bit 8: Protocol is too long (e.g. > 64 bits).
Bit 9: Receive buffer overflow.
Bit 10: Frame error when reading twice.
Bit 11: Parity error.
Bit 12: Data line signal level error during the monoflop time.
Bit 13: Data line incorrect.

Remedy:
- Re fault value, bit 0 = 1:
  - Enc defect F31111 may provide additional details.
- Re fault value, bit 1 = 1:
  - Incorrect encoder type / replace the encoder or encoder cable.
- Re fault value, bit 2 = 1:
  - Incorrect encoder type / replace the encoder or encoder cable.
- Re fault value, bit 3 = 1:
  - EMC / connect the cable shield, replace the encoder or encoder cable.
- Re fault value, bit 4 = 1:
  - EMC / connect the cable shield, replace the encoder or encoder cable, replace the Sensor Module.
- Re fault value, bit 5 = 1:
  - EMC / connect the cable shield, replace the encoder or encoder cable, replace the Sensor Module.
- Re fault value, bit 6 = 1:
  - Update Sensor Module firmware.
- Re fault value, bit 8 = 1:
  - Check parameterization (p0429.2).
- Re fault value, bit 9 = 1:
  - EMC / connect the cable shield, replace the encoder or encoder cable, replace the Sensor Module.
- Re fault value, bit 10 = 1:
  - Check parameterization (p0429.2, p0449).
- Re fault value, bit 11 = 1:
  - Check parameterization (p0436).
- Re fault value, bit 12 = 1:
  - Check parameterization (p0429.6).
- Re fault value, bit 13 = 1:
  - Check data line.

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F31111 (N, A)  Encoder 1: Absolute encoder EnDat, internal fault/error

Message value:
Fault cause: %1 bin
Drive object:
SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction:
ENCODER (IASC/DCBRAKE, NONE)
Acknowledge:
PULSE INHIBIT
Cause:
The EnDat encoder fault word supplies fault bits that have been set.
Fault value (r0949, interpret binary):
Bit 0: Lighting system failed.
Bit 1: Signal amplitude too low.
Bit 2: Position value incorrect.
Bit 3: Encoder power supply overvoltage condition.
Bit 4: Encoder power supply undervoltage condition.
Bit 5: Encoder power supply overcurrent condition.
Bit 6: The battery must be changed.
See also: p0491 (Motor encoder fault response ENCODER)

Remedy:
- Re fault value, bit 0 = 1:
  - Encoder is defective. Replace the encoder, where the motor encoder has a direct DRIVE-CLiQ socket: Replace the motor.
Faults and alarms

List of faults and alarms

Re fault value, bit 1 = 1:
Encoder is defective. Replace the encoder, where the motor encoder has a direct DRIVE-CLiQ socket: Replace the motor.

Re fault value, bit 2 = 1:
Encoder is defective. Replace the encoder, where the motor encoder has a direct DRIVE-CLiQ socket: Replace the motor.

Re fault value, bit 3 = 1:
5 V power supply voltage fault.
When using an SMC: Check the plug-in cable between the encoder and SMC or replace the SMC.
When a motor encoder with a direct DRIVE-CLiQ connection is used: Replace the motor.

Re fault value, bit 4 = 1:
5 V power supply voltage fault.
When using an SMC: Check the plug-in cable between the encoder and SMC or replace the SMC.
When using a motor with DRIVE-CLiQ: Replace the motor.

Re fault value, bit 5 = 1:
Encoder is defective. Replace the encoder, where the motor encoder has a direct DRIVE-CLiQ socket: Replace the motor.

Re fault value, bit 6 = 1:
The battery must be changed (only for encoders with battery back-up).

---

F31112 (N, A) Encoder 1: Error bit set in the serial protocol

**Message value:** %1

**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

**Reaction:** ENCODER (IASC/DCBRAKE, NONE)

**Acknowledge:** PULSE INHIBIT

**Cause:**
The encoder sends a set error bit via the serial protocol.
Fault value (r0949, interpret binary):
Bit 0: Fault bit in the position protocol.

**Remedy:**
For fault value, bit 0 = 1:
In the case of an EnDat encoder, F31111 may provide further details.

---

F31115 (N, A) Encoder 1: Amplitude error track A or B (A^2 + B^2)

**Message value:** A: %1, B: %2

**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

**Reaction:** ENCODER (IASC/DCBRAKE, NONE)

**Acknowledge:** PULSE INHIBIT

**Cause:**
The amplitude (root of A^2 + B^2) for encoder 1 exceeds the permissible tolerance.
Fault value (r0949, interpret hexadecimal):

yyyxxxx hex:
yyyy = Signal level, track B (16 bits with sign).
xxxx = Signal level, track A (16 bits with sign).

The nominal signal level of the encoder must lie in the range 375 mV to 600 mV (500 mV -25/+20 %).
The response thresholds are < 230 mV (observe the frequency response of the encoder) and > 750 mV.
A signal level of 500 mV peak value corresponds to the numerical value 5333 hex = 21299 dec.
Note for sensors modules for resolvers (e. g. SMC10):
The nominal signal level is at 2900 mV (2.0 Vrms). The response thresholds are < 1070 mV and > 3582 mV.
A signal level of 2900 mV peak value corresponds to the numerical value 6666 hex = 26214 dec.

Note:
The analog values of the amplitude error are not measured at the same time with the hardware fault output by the Sensor Module.
See also: p0491 (Motor encoder fault response ENCODER)
Remedy:
- check that the encoder cables and shielding are routed in compliance with EMC.
- check the plug connections
- replace the encoder or encoder cable
- check the Sensor Module (e.g. contacts).
The following applies to measuring systems without their own bearing system:
- adjust the scanning head and check the bearing system of the measuring wheel.
The following applies for measuring systems with their own bearing system:
- ensure that the encoder housing is not subject to any axial force.

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F31116 (N, A)  Encoder 1: Amplitude error monitoring track A + B
Message value:  A track: %1, B-track: %2
Drive object:  SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction:  ENCODER (IASC/DCBRAKE, NONE)
Acknowledge:  IMMEDIATELY
Cause:  The amplitude of the rectified encoder signals A and B and the amplitude from the roots of A^2 + B^2 for encoder 1 are not within the tolerance bandwidth.
Fault value (r0949, interpret hexadecimal):
yyyyxxxx hex:
  yyyy = Signal level, track B (16 bits with sign).
  xxxx = Signal level, track A (16 bits with sign).
The nominal signal level of the encoder must lie in the range 375 mV to 600 mV (600 mV -25/+20 %).
The response thresholds are < 176 mV (observe the frequency response of the encoder) and > 955 mV.
A signal level of 500 mV peak value corresponds to the numerical value 5333 hex = 21299 dec.
Note:  The analog values of the amplitude error are not measured at the same time with the hardware fault output by the Sensor Module.
See also: p0491 (Motor encoder fault response ENCODER)
Remedy:
- check that the encoder cables and shielding are routed in compliance with EMC.
- check the plug connections
- replace the encoder or encoder cable
- check the Sensor Module (e.g. contacts).

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F31117 (N, A)  Encoder 1: Inversion error signals A/B/R
Message value:  Fault cause: %1 bin
Drive object:  SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction:  ENCODER (IASC/DCBRAKE, NONE)
Acknowledge:  IMMEDIATELY
Cause:  For a square-wave encoder (bipolar, double ended) signals A*, B* and R* are not inverted with respect to signals A, B and R.
Fault value (r0949, interpret binary):
  Bits 0 ... 15: Only for internal Siemens troubleshooting.
  Bit 16: Error track A.
  Bit 17: Error track B.
  Bit 18: Error track R.
Note:  For SMC30 (order no., 6SL3055-0AA00-5CA0 and 6SL3055-0AA00-5CA1 only), CUA32, and CU310, the following applies:
A square-wave encoder without track R is used and track monitoring (p0405.2 = 1) is activated.
See also: p0491 (Motor encoder fault response ENCODER)
<table>
<thead>
<tr>
<th>Fault Code</th>
<th>Description</th>
<th>Drive Object</th>
<th>Reaction upon N</th>
<th>Acknowl. upon N</th>
<th>Reaction upon A</th>
<th>Acknowl. upon A</th>
</tr>
</thead>
<tbody>
<tr>
<td>F31118 (N, A) Encoder 1: Speed difference outside the tolerance range</td>
<td></td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>NONE</td>
<td>NONE</td>
<td>NONE</td>
<td>NONE</td>
</tr>
<tr>
<td>F31120 (N, A) Encoder 1: Power supply voltage fault</td>
<td></td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>NONE</td>
<td>NONE</td>
<td>NONE</td>
<td>NONE</td>
</tr>
</tbody>
</table>
Re fault value, bit 2 = 1:
- correct encoder cable connected?
- replace the encoder or encoder cable
Re fault value, bit 3 = 1:
- correct encoder cable connected?
- replace the encoder or encoder cable

Reaction upon N: NONE
Acknow. upon N: NONE
Reaction upon A: NONE
Acknow. upon A: NONE

F31121 (N, A) Encoder 1: Coarse position error
Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: ENCODER (NONE)
Acknowledge: PULSE INHIBIT
Cause: For the actual value sensing, an error was detected on the module. As a result of this error, it must be assumed that the actual value sensing supplies an incorrect coarse position.
See also: p0491 (Motor encoder fault response ENCODER)
Remedy: Replace the motor with DRIVE-CLiQ or the appropriate Sensor Module.

Reaction upon N: NONE
Acknow. upon N: NONE
Reaction upon A: NONE
Acknow. upon A: NONE

F31122 Encoder 1: Internal power supply voltage faulty
Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: ENCODER
Acknowledge: IMMEDIATELY
Cause: Fault in internal reference voltage of ASICs for encoder 1.
Fault value (r0949, decimal interpretation):
1: Reference voltage error.
2: Internal undervoltage.
3: Internal overvoltage.
Fault value (r0949, interpret binary):
Bit 0 = 1: Either AP or AN outside the tolerance.
Bit 16 = 1: Either BP or BN outside the tolerance.
The unipolar nominal signal level of the encoder must lie in the range 2500 mV +/- 500 mV.
The response thresholds are < 1700 mV and > 3300 mV.
Note: The signal level is not evaluated unless the following conditions are satisfied:
  - Sensor Module properties available (r0459.31 = 1).
  - Monitoring active (p0437.31 = 1).
See also: p0491 (Motor encoder fault response ENCODER)
Remedy: Replace the motor with DRIVE-CLiQ or the appropriate Sensor Module.

F31123 (N, A) Encoder 1: Signal level A/B unipolar outside tolerance
Message value: Fault cause: %1 bin
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: ENCODER (IASC/DCBRAKE, NONE)
Acknowledge: PULSE INHIBIT
Cause: The unipolar level (AP/AN or BP/BN) for encoder 1 is outside the permissible tolerance.
Fault value (r0949, interpret binary):
Bit 0 = 1: Either AP or AN outside the tolerance.
Bit 16 = 1: Either BP or BN outside the tolerance.
The unipolar nominal signal level of the encoder must lie in the range 2500 mV +/- 500 mV.
The response thresholds are < 1700 mV and > 3300 mV.
Note: The signal level is not evaluated unless the following conditions are satisfied:
  - Sensor Module properties available (r0459.31 = 1).
  - Monitoring active (p0437.31 = 1).
See also: p0491 (Motor encoder fault response ENCODER)
Remedy: - make sure that the encoder cables and shielding are installed in an EMC-compliant manner.
  - check the plug connections and contacts of the encoder cable.
  - check the short-circuit of a signal cable with mass or the operating voltage.
  - replace the encoder cable.
### Faults and alarms

#### List of faults and alarms

<table>
<thead>
<tr>
<th>Fault Code</th>
<th>Description</th>
<th>Message Value</th>
<th>Drive Object</th>
<th>Reaction</th>
<th>Acknowledge</th>
<th>Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>F31125 (N, A)</td>
<td>Encoder 1: Amplitude error track A or B overcontrolled</td>
<td>A track: %1, B-track: %2</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>ENCODER (IASC/DCBRAKE, NONE)</td>
<td>PULSE INHIBIT</td>
<td>The amplitude of track A or B for encoder 1 exceeds the permissible tolerance band. Fault value (r0949, interpret hexadecimal): yyyyxxxx hex: yyyy = Signal level, track B (16 bits with sign), xxxx = Signal level, track A (16 bits with sign). The nominal signal level of the encoder must lie in the range 375 mV to 600 mV (500 mV ±25/+20 %). The response threshold is &gt; 750 mV. This fault also occurs if the A/D converter is overcontrolled. A signal level of 500 mV peak value corresponds to the numerical value 5333 hex = 21299 dec. Note for sensors modules for resolvers (e. g. SMC10): The nominal signal level is at 2900 mV (2.0 Vrms). The response threshold is &gt; 3582 mV. A signal level of 2900 mV peak value corresponds to the numerical value 6666 hex = 26214 dec. Note: The analog values of the amplitude error are not measured at the same time with the hardware fault output by the Sensor Module. See also: p0491 (Motor encoder fault response ENCODER)</td>
</tr>
<tr>
<td>F31126 (N, A)</td>
<td>Encoder 1: Amplitude AB too high</td>
<td>Amplitude: %1, Angle: %2</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>ENCODER (IASC/DCBRAKE, NONE)</td>
<td>PULSE INHIBIT</td>
<td>The amplitude (root of A^2 + B^2 or</td>
</tr>
</tbody>
</table>

#### Remedy:

- check that the encoder cables and shielding are routed in compliance with EMC.
- replace the encoder or encoder cable

| Reaction upon N: | NONE |
| Acknowl. upon N: | NONE |
| Reaction upon A: | NONE |
| Acknowl. upon A: | NONE |
F31129 (N, A) Encoder 1: Position difference, hall sensor/track C/D and A/B too large

Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: ENCODER (IASC/DCBRAKE, NONE)
Acknowledge: PULSE INHIBIT

Cause:
The error for track C/D is greater than +/-15 ° mechanical or +/-60 ° electrical or the error for the Hall signals is greater than +/-60 ° electrical.
One period of track C/D corresponds to 360 ° mechanical.
One period of the Hall signal corresponds to 360 ° electrical.
The monitoring responds if, for example, Hall sensors are connected as equivalent for the C/D tracks with the incorrect rotational sense or supply values that are not accurate enough.
After the fine synchronization using one reference mark or 2 reference marks for distance-coded encoders, this fault is no longer initiated, but instead, Alarm A31429.
Fault value (r0949, decimal interpretation):
For track C/D, the following applies:
Measured deviation as mechanical angle (16 bits with sign, 182 dec corresponds to 1 °).
For Hall signals, the following applies:
Measured deviation as electrical angle (16 bits with sign, 182 dec corresponds to 1 °).
See also: p0491 (Motor encoder fault response ENCODER)

Remedy:
- track C or D not connected.
- correct the direction of rotation of the Hall sensor possibly connected as equivalent for track C/D.
- check that the encoder cables are routed in compliance with EMC.
- check the adjustment of the Hall sensor.

F31130 (N, A) Encoder 1: Zero mark and position error from the coarse synchronization

Message value: Angular deviation, electrical: %1, angle, mechanical: %2
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: ENCODER (IASC/DCBRAKE, NONE, OFF1, OFF2, OFF3, STOP1, STOP2)
Acknowledge: PULSE INHIBIT

Cause:
After initializing the pole position using track C/D, Hall signals or pole position identification routine, the zero mark was detected outside the permissible range. For distance-coded encoders, the test is carried out after passing 2 zero marks. Fine synchronization was not carried out.
When initializing via track C/D (p0404) then it is checked whether the zero mark occurs in an angular range of +/-18 ° mechanical.
When initializing via Hall sensors (p0404) or pole position identification (p1982) it is checked whether the zero mark occurs in an angular range of +/-60 ° electrical.
Fault value (r0949, interpret hexadecimal):
yyyyyyyy hex
/yyyy: Determined mechanical zero mark position (can only be used for track C/D).
xxxx: Deviation of the zero mark from the expected position as electrical angle.
Scaling: 32768 dec = 180 °
See also: p0491 (Motor encoder fault response ENCODER)

Remedy:
- Check p0431 and, if necessary, correct (trigger via p1990 = 1 if necessary).
- check that the encoder cables are routed in compliance with EMC.
- check the plug connections
- if the Hall sensor is used as an equivalent for track C/D, check the connection.
- Check the connection of track C or D.
- replace the encoder or encoder cable
Faults and alarms

List of faults and alarms

F31131 (N, A) Encoder 1: Deviation, position incremental/absolute too large

Message value: %1

Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

Reaction: ENCODER (IASC/DCBRAKE, NONE, OFF1, OFF2, OFF3, STOP1, STOP2)

Acknowledge: PULSE INHIBIT

Cause: Absolute encoder:
When cyclically reading the absolute position, an excessively high difference to the incremental position was detected. The absolute position that was read is rejected.
Limit value for the deviation:
- EnDat encoder: Is supplied from the encoder and is a minimum of 2 quadrants (e.g. EQI 1325 > 2 quadrants, EQN 1325 > 50 quadrants).
- other encoders: 15 pulses = 60 quadrants.
Incremental encoder:
When the zero pulse is passed, a deviation in the incremental position was detected.
For equidistant zero marks, the following applies:
- The first zero mark passed supplies the reference point for all subsequent checks. The other zero marks must have n times the distance referred to the first zero mark.
For distance-coded zero marks, the following applies:
- the first zero mark pair supplies the reference point for all subsequent checks. The other zero mark pairs must have the expected distance to the first zero mark pair.
Fault value (r0949, decimal interpretation):
Deviation in quadrants (1 pulse = 4 quadrants).
See also: p0491 (Motor encoder fault response ENCODER)

Remedy:
- check that the encoder cables are routed in compliance with EMC.
- check the plug connections
- replace the encoder or encoder cable
- check whether the coding disk is dirty or there are strong ambient magnetic fields.
- adapt the parameter for the clearance between zero marks (p0425).
- if message output above speed threshold, reduce filter time if necessary (p0438).

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F31135 Encoder 1: Fault when determining the position

Message value: Fault cause: %1 bin

Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

Reaction: ENCODER (IASC/DCBRAKE, NONE)

Acknowledge: PULSE INHIBIT

Cause: The DRIVE-CLiQ encoder supplies status information via bits in an internal status/fault word. Some of these bits cause this fault to be triggered. Other bits are status displays. The status/fault word is displayed in the fault value.
Fault value (r0949, interpret binary):
Bit 0: F1 (safety status display)
Bit 1: F2 (safety status display)
Bit 2: Lighting (reserved)
Bit 3: Signal amplitude (reserved)
Bit 4: Position value (reserved)
Bit 5: Overvoltage (reserved)
Bit 6: Undervoltage (reserved)
Bit 7: Overcurrent (reserved)
Bit 8: Battery (reserved)
Bit 16: Lighting (→ F3x135, x = 1, 2, 3)
Bit 17: Signal amplitude (→ F3x135, x = 1, 2, 3)
Bit 18: Singleturn position 1 (→ F3x135, x = 1, 2, 3)
Bit 19: Overvoltage (→ F3x135, x = 1, 2, 3)
Bit 20: Undervoltage (→ F3x135, x = 1, 2, 3)
Bit 21: Overcurrent (→ F3x135, x = 1, 2, 3)
Bit 22: Temperature exceeded (→ F3x405, x = 1, 2, 3)
Bit 23: Singleturn position 2 (safety status display)
List of faults and alarms

Faults and alarms

Bit 24: Singleturn system (→ F3x135, x = 1, 2, 3)
Bit 25: Singleturn power down (→ F3x135, x = 1, 2, 3)
Bit 26: Multiturn position 1 (→ F3x136, x = 1, 2, 3)
Bit 27: Multiturn position 2 (→ F3x136, x = 1, 2, 3)
Bit 28: Multiturn system (→ F3x136, x = 1, 2, 3)
Bit 29: Multiturn power down (→ F3x136, x = 1, 2, 3)
Bit 30: Multiturn overflow/underflow (→ F3x136, x = 1, 2, 3)
Bit 31: Multiturn battery (reserved)

Remedy:
Replace DRIVE-CLiQ encoder.

F31136 Encoder 1: Error when determining multiturn information

Message value: Fault cause: %1 bin
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: ENCODER (IASC/DCBRAKE, NONE)
Acknowledge: PULSE INHIBIT
Cause:
The DRIVE-CLiQ encoder supplies status information via bits in an internal status/fault word. Some of these bits cause this fault to be triggered. Other bits are status displays. The status/fault word is displayed in the fault value.

Fault value (r0949, interpret binary):
Bit 0: F1 (safety status display)
Bit 1: F2 (safety status display)
Bit 2: Lighting (reserved)
Bit 3: Signal amplitude (reserved)
Bit 4: Position value (reserved)
Bit 5: Overvoltage (reserved)
Bit 6: Undervoltage (reserved)
Bit 7: Overcurrent (reserved)
Bit 8: Battery (reserved)
Bit 16: Lighting (→ F3x135, x = 1, 2, 3)
Bit 17: Signal amplitude (→ F3x135, x = 1, 2, 3)
Bit 18: Singleturn position 1 (→ F3x135, x = 1, 2, 3)
Bit 19: Overvoltage (→ F3x135, x = 1, 2, 3)
Bit 20: Undervoltage (→ F3x135, x = 1, 2, 3)
Bit 21: Overcurrent (→ F3x135, x = 1, 2, 3)
Bit 22: Temperature exceeded (→ F3x405, x = 1, 2, 3)
Bit 23: Singleturn position 2 (safety status display)
Bit 24: Singleturn system (→ F3x135, x = 1, 2, 3)
Bit 25: Singleturn power down (→ F3x135, x = 1, 2, 3)
Bit 26: Multiturn position 1 (→ F3x136, x = 1, 2, 3)
Bit 27: Multiturn position 2 (→ F3x136, x = 1, 2, 3)
Bit 28: Multiturn system (→ F3x136, x = 1, 2, 3)
Bit 29: Multiturn power down (→ F3x136, x = 1, 2, 3)
Bit 30: Multiturn overflow/underflow (→ F3x136, x = 1, 2, 3)
Bit 31: Multiturn battery (reserved)

Remedy:
Replace DRIVE-CLiQ encoder.

F31137 Encoder 1: Internal fault when determining the position

Message value: Fault cause: %1 bin
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: ENCODER (IASC/DCBRAKE, NONE)
Acknowledge: PULSE INHIBIT
Cause:
The DRIVE-CLiQ encoder fault word supplies fault bits that have been set. Fault value (r0949, interpret binary):
Only for internal Siemens troubleshooting.

Remedy:
Replace encoder.
### F31138 Encoder 1: Internal error when determining multiturn information

**Message value:** Fault cause: %1 bin  
**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
**Reaction:** ENCODER (IASC/DCBRAKE, NONE)  
**Acknowledge:** PULSE INHIBIT  
**Cause:** The DRIVE-CLiQ encoder fault word supplies fault bits that have been set. Fault value (r0949, interpret binary):  
Only for internal SIEMENS troubleshooting.  
**Remedy:** Replace encoder.

### F31150 (N, A) Encoder 1: Initialization error

**Message value:**  
**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
**Reaction:** ENCODER (IASC/DCBRAKE, NONE, OFF1, OFF2, OFF3, STOP1, STOP2)  
**Acknowledge:** PULSE INHIBIT  
**Cause:** Encoder functionality selected in p0404 is not operating correctly. Fault value (r0949, interpret hexadecimal):  
Encoder malfunction. The bit assignment corresponds to that of p0404 (e.g. bit 5 set: Error track C/D). See also: p0404 (Encoder configuration effective), p0491 (Motor encoder fault response ENCODER)  
**Remedy:** - Check that p0404 is correctly set.  
- check the encoder type used (incremental/absolute) and for SMCxx, the encoder cable.  
- if relevant, note additional fault messages that describe the fault in detail.  
**Reaction upon N:** NONE  
**Acknowl. upon N:** NONE  
**Reaction upon A:** NONE  
**Acknowl. upon A:** NONE

### F31151 (N, A) Encoder 1: Encoder speed for initialization AB too high

**Message value:**  
**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
**Reaction:** ENCODER (IASC/DCBRAKE, NONE, OFF1, OFF2, OFF3, STOP1, STOP2)  
**Acknowledge:** PULSE INHIBIT  
**Cause:** The encoder speed is too high during while initializing the sensor.  
**Remedy:** Reduce the speed of the encoder accordingly during initialization. If necessary, de-activate monitoring (p0437.29). See also: p0437 (Sensor Module configuration extended)  
**Reaction upon N:** NONE  
**Acknowl. upon N:** NONE  
**Reaction upon A:** NONE  
**Acknowl. upon A:** NONE

### F31160 (N, A) Encoder 1: Analog sensor channel A failed

**Message value:**  
**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
**Reaction:** ENCODER (IASC/DCBRAKE, NONE)  
**Acknowledge:** PULSE INHIBIT  
**Cause:** The input voltage of the analog sensor is outside the permissible limits. Fault value (r0949, decimal interpretation):  
1: Input voltage outside detectable measuring range.  
2: Input voltage outside the measuring range set in (p4673).  
3: The absolute value of the input voltage has exceeded the range limit (p4676).
F31161 (N, A) Encoder 1: Analog sensor channel B failed

Message value: %1

Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

Reaction: ENCODER (IASC/DCBRAKE, NONE)

Acknowledge: PULSE INHIBIT

Cause: The input voltage of the analog sensor is outside the permissible limits.
- Fault value (r0949, decimal interpretation):
  1: Input voltage outside detectable measuring range.
  2: Input voltage outside the measuring range set in (p4675).
  3: The absolute value of the input voltage has exceeded the range limit (p4676).

Remedy:
- For fault value = 1:
  - check the output voltage of the analog sensor.
- For fault value = 2:
  - check the voltage setting for each encoder period (p4675).
- For fault value = 3:
  - check the range limit setting and increase it if necessary (p4676).

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F31163 (N, A) Encoder 1: Analog sensor position value exceeds limit value

Message value: %1

Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

Reaction: ENCODER (IASC/DCBRAKE, NONE)

Acknowledge: PULSE INHIBIT

Cause: The position value has exceeded the permissible range of -0.5 ... +0.5.
- Fault value (r0949, decimal interpretation):
  1: Position value from the LVDT sensor.
  2: Position value from the encoder characteristic.

Remedy:
- For fault value = 1:
  - Check the LVDT ratio (p4678).
  - check the reference signal connection at track B.
- For fault value = 2:
  - check the coefficients of the characteristic (p4663 ... p4666).

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

A31400 (F, N) Encoder 1: Alarm threshold zero mark distance error

Message value: %1

Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

Reaction: NONE

Acknowledge: NONE

Cause: The measured zero mark distance does not correspond to the parameterized zero mark distance.
For distance-coded encoders, the zero mark distance is determined from zero marks detected pairs. This means that if a zero mark is missing, depending on the pair generation, this cannot result in a fault and also has no effect in the system.

The zero mark distance for the zero mark monitoring is set in p0425 (rotary encoder) or p0424 (linear encoder).

**Alarm value (r2124, interpret decimal):**

- Last measured zero mark distance in increments (4 increments = 1 encoder pulse).
- The sign designates the direction of motion when detecting the zero mark distance.

**Remedy:**
- check that the encoder cables are routed in compliance with EMC.
- check the plug connections
- check the encoder type (encoder with equidistant zero marks).
- adapt the parameter for the distance between zero marks (p0424, p0425).
- replace the encoder or encoder cable

**Reaction upon F:** NONE (ENCODER, IASC/DCBRAKE, OFF1, OFF2, OFF3, STOP1, STOP2)
**Acknowl. upon F:** IMMEDIATELY
**Reaction upon N:** NONE
**Acknowl. upon N:** NONE

**F31405 (N, A) Encoder 1: Temperature in the encoder evaluation inadmissible**

**Message value:** %1
**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
**Reaction:** ENCODER (IASC/DCBRAKE, NONE, OFF1, OFF2, OFF3, STOP1, STOP2)
**Acknowledge:** IMMEDIATELY (POWER ON)
**Cause:** The encoder evaluation for a motor with DRIVE-CLiQ has detected an inadmissible temperature.
- The fault threshold is 125 °C.
- Alarm value (r2124, interpret decimal):
  - Measured board/module temperature in 0.1 °C.
**Remedy:** Reduce the ambient temperature for the DRIVE-CLiQ connection of the motor.
**Reaction upon N:** NONE
**Acknowl. upon N:** NONE
**Acknowl. upon A:** NONE
A31407 (F, N)  Encoder 1: Function limit reached
Message value:  %1
Drive object:  SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction:  NONE
Acknowledge:  NONE
Cause:  The encoder has reached one of its function limits. A service is recommended.
Alarm value (r2124, interpret decimal):
1 : Incremental signals
3 : Absolute track
4 : Code connection
Remedy:  Perform service. Replace the encoder if necessary.
Note:  The current functional reserve of an encoder can be displayed via r4651.
See also: p4650 (Encoder functional reserve component number), r4651 (Encoder functional reserve)
Reaction upon F:  NONE (ENCODER, IASC/DCBRAKE, OFF1, OFF2, OFF3, STOP1, STOP2)
Acknowl. upon F:  IMMEDIATELY
Reaction upon N:  NONE
Acknowl. upon N:  NONE

A31410 (F, N)  Encoder 1: Serial communications
Message value:  Fault cause: %1 bin
Drive object:  SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction:  NONE
Acknowledge:  NONE
Cause:  Serial communication protocol transfer error between the encoder and evaluation module.
Alarm value (r2124, binary interpretation):
Bit 0: Alarm bit in the position protocol.
Bit 1: Incorrect quiescent level on the data line.
Bit 2: Encoder does not respond (does not supply a start bit within 50 ms).
Bit 3: CRC error: The checksum in the protocol from the encoder does not match the data.
Bit 4: Encoder acknowledgement error: The encoder incorrectly understood the task (request) or cannot execute it.
Bit 5: Internal error in the serial driver: An illegal mode command was requested.
Bit 6: Timeout when cyclically reading.
Bit 8: Protocol is too long (e.g. > 64 bits).
Bit 9: Receive buffer overflow.
Bit 10: Frame error when reading twice.
Bit 11: Parity error.
Bit 12: Data line signal level error during the monoflop time.
Remedy:  - check that the encoder cables are routed in compliance with EMC.
- check the plug connections
- replace the encoder.
Reaction upon F:  NONE (ENCODER, IASC/DCBRAKE, OFF1, OFF2, OFF3, STOP1, STOP2)
Acknowl. upon F:  IMMEDIATELY
Reaction upon N:  NONE
Acknowl. upon N:  NONE

A31411 (F, N)  Encoder 1: EnDat encoder signals alarms
Message value:  Fault cause: %1 bin
Drive object:  SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction:  NONE
Acknowledge:  NONE
Cause:  The error word of the EnDat encoder has alarm bits that have been set.
Alarm value (r2124, binary interpretation):
Bit 0: Frequency exceeded (speed too high).
Bit 1: Temperature exceeded.
Bit 2: Control reserve, lighting system exceeded.
### Faults and alarms

#### List of faults and alarms

- **Bit 3**: Battery discharged.
- **Bit 4**: Reference point passed.

**Remedy:**
- Replace encoder.

**See also:** p0491 (Motor encoder fault response ENCODER)

**Reaction upon F:** NONE (ENCODER, IASC/DCBRAKE, OFF1, OFF2, OFF3, STOP1, STOP2)

**Acknow. upon F:** IMMEDIATELY

**Reaction upon N:** NONE

**Acknow. upon N:** NONE

---

**A31412 (F, N) Encoder 1: Error bit set in the serial protocol**

**Message value:** %1

**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:** The encoder sends a set error bit via the serial protocol.

**Alarm value (r2124, binary interpretation):**
- Bit 0: Fault bit in the position protocol.
- Bit 1: Alarm bit in the position protocol.

**Remedy:**
- carry out a POWER ON (power off/on) for all components.
- check that the encoder cables are routed in compliance with EMC.
- check the plug connections
- replace the encoder.

**Reaction upon F:** NONE (ENCODER, IASC/DCBRAKE, OFF1, OFF2, OFF3, STOP1, STOP2)

**Acknow. upon F:** IMMEDIATELY

**Reaction upon N:** NONE

**Acknow. upon N:** NONE

---

**A31414 (F, N) Encoder 1: Amplitude error track C or D (C^2 + D^2)**

**Message value:** C track: %1, D track: %2

**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:** The amplitude (C^2 + D^2) of track C or D of the encoder or from the Hall signals, is not within the tolerance bandwidth.

**Alarm value (r2124, interpret hexadecimal):**
- yyyyyxxx hex:
  - yyyy = Signal level, track D (16 bits with sign).
  - xxxx = Signal level, track C (16 bits with sign).

The nominal signal level of the encoder must lie in the range 375 mV to 600 mV (500 mV -25/+20 %).
The response thresholds are < 230 mV (observe the frequency response of the encoder) and > 750 mV.
A signal level of 500 mV peak value corresponds to the numerical value 5333 hex = 21299 dec.

**Note:**
- If the amplitude is not within the tolerance bandwidth, then it cannot be used to initialize the start position.

**Remedy:**
- check that the encoder cables are routed in compliance with EMC.
- check the plug connections
- replace the encoder or encoder cable
- check the Sensor Module (e.g. contacts).
- check the Hall sensor box

**Reaction upon F:** NONE (ENCODER, IASC/DCBRAKE, OFF1, OFF2, OFF3, STOP1, STOP2)

**Acknow. upon F:** IMMEDIATELY

**Reaction upon N:** NONE

**Acknow. upon N:** NONE
### N31415 (F, A) Encoder 1: Amplitude alarm track A or B (A^2 + B^2)

<table>
<thead>
<tr>
<th>Message value</th>
<th>Drive object</th>
<th>Reaction</th>
<th>Acknowledge</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amplitude: %1, Angle: %2</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>NONE</td>
<td>NONE</td>
<td>The amplitude (root of A^2 + B^2) for encoder 1 exceeds the permissible tolerance.</td>
<td>- check the speed range, frequency characteristic (amplitude characteristic) of the measuring equipment is not sufficient for the speed range. - check that the encoder cables and shielding are routed in compliance with EMC. - check the plug connections - replace the encoder or encoder cable - check the Sensor Module (e.g. contacts). - if the coding disk is soiled or the lighting aged, replace the encoder.</td>
</tr>
</tbody>
</table>

#### Alarm value (r2124, interpret hexadecimal):
- yyyy = Angle
- xxxx = Amplitude, i.e. root from A^2 + B^2 (16 bits without sign)

#### Note:
The analog values of the amplitude error are not measured at the same time with the hardware fault output by the Sensor Module.

#### See also:
p0491 (Motor encoder fault response ENCODER)


### A31418 (F, N) Encoder 1: Speed difference per sampling rate exceeded

<table>
<thead>
<tr>
<th>Message value</th>
<th>Drive object</th>
<th>Reaction</th>
<th>Acknowledge</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>%1</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>NONE</td>
<td>NONE</td>
<td>For an HTL/TTL encoder, the speed difference between two sampling cycles has exceeded the value in p0492.</td>
<td>- check the tachometer feeder cable for interruptions. - check the grounding of the tachometer shielding. - if required, increase the setting of p0492.</td>
</tr>
</tbody>
</table>

#### Alarm value (r2124, interpret decimal):
- Only for internal Siemens troubleshooting.

#### See also:
p0492 (Square-wave encoder, maximum speed difference per sampling cycle)
### A31419 (F, N) Encoder 1: Track A or B outside tolerance

| Message value: | %1 |
| Drive object:  | SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN |
| Reaction:      | NONE |
| Acknowledge:   | NONE |
| Cause:         | The amplitude/phase/offset correction for track A or B is at the limit. |
|                | Amplitude error correction: Amplitude B / Amplitude A = 0.78 ... 1.27 |
|                | Phase: <84 degrees or >96 degrees |
|                | SMC20: Offset correction: +/-140 mV |
|                | SMC10: Offset correction: +/-650 mV |
|                | Alarm value (r2124, interpret hexadecimal): |
|                | xxxx1: Minimum of the offset correction, track B |
|                | xxxx2: Maximum of the offset correction, track B |
|                | xxx1x: Minimum of the offset correction, track A |
|                | xxx2x: Maximum of the offset correction, track A |
|                | xx1xx: Minimum of the amplitude correction, track B/A |
|                | xx2xx: Maximum of the amplitude correction, track B/A |
|                | x1xxx: Minimum of the phase error correction |
|                | x2xxx: Maximum of the phase error correction |
|                | 1xxxx: Minimum of the cubic correction |
|                | 2xxxx: Maximum of the cubic correction |
| Remedy:        | - check mechanical mounting tolerances for encoders without their own bearings (e.g. toothed-wheel encoders). |
|                | - check the plug connections (also the transition resistance). |
|                | - replace the encoder or encoder cable |
| Reaction upon F: | NONE (ENCODER, IASC/DCBRAKE, OFF1, OFF2, OFF3, STOP1, STOP2) |
| Acknowl. upon F: | IMMEDIATELY |
| Reaction upon N: | NONE |
| Acknowl. upon N: | NONE |

### A31421 (F, N) Encoder 1: Coarse position error

| Message value: | %1 |
| Drive object:  | SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN |
| Reaction:      | NONE |
| Acknowledge:   | NONE |
| Cause:         | For the actual value sensing, an error was detected. As a result of this error, it must be assumed that the actual value sensing supplies an incorrect coarse position. |
|                | Alarm value (r2124, interpret decimal): |
|                | 3: The absolute position of the serial protocol and track A/B differ by half an encoder pulse. The absolute position must have its zero position in the quadrants in which both tracks are negative. In the case of a fault, the position can be incorrect by one encoder pulse. |
| Remedy:        | Re alarm value = 3: |
|                | - For a standard encoder with cable, contact the manufacturer where relevant. |
|                | - correct the assignment of the tracks to the position value that is serially transferred. To do this, the two tracks must be connected, inverted, at the Sensor Module (interchange A with A* and B with B*) or, for a programmable encoder, check the zero offset of the position. |
| Reaction upon F: | NONE (ENCODER, IASC/DCBRAKE, OFF1, OFF2, OFF3, STOP1, STOP2) |
| Acknowl. upon F: | IMMEDIATELY |
| Reaction upon N: | NONE |
| Acknowl. upon N: | NONE |
A31422 (F, N) Encoder 1: Pulses per revolution square-wave encoder outside tolerance bandwidth

Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: The measured zero mark distance does not correspond to the parameterized zero mark distance. This alarm is triggered with active square-wave encoder PPR correction and re-parameterized fault 31131 if the accumulator contains larger values than p4683 or p4684. The zero mark distance for zero mark monitoring is set in p0425 (rotary encoder). Alarm value (r2124, interpret decimal): accumulated differential pulses in encoder pulses.

Remedy:
- check that the encoder cables are routed in compliance with EMC.
- check the plug connections
- check the encoder type (encoder with equidistant zero marks).
- adapt the parameter for the distance between zero marks (p0424, p0425).
- replace the encoder or encoder cable

Reaction upon F: NONE (ENCODER, IASC/DCBRAKE, OFF1, OFF2, OFF3, STOP1, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

A31429 (F, N) Encoder 1: Position difference, hall sensor/track C/D and A/B too large

Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: The error for track C/D is greater than +/-15 ° mechanical or +/-60 ° electrical or the error for the Hall signals is greater than +/-60 ° electrical. One period of track C/D corresponds to 360 ° mechanical. One period of the Hall signal corresponds to 360 ° electrical. The monitoring responds if, for example, Hall sensors are connected as equivalent for the C/D tracks with the incorrect rotational sense or supply values that are not accurate enough.

Alarm value (r2124, interpret decimal):
For track C/D, the following applies:
Measured deviation as mechanical angle (16 bits with sign, 182 dec corresponds to 1 °).
For Hall signals, the following applies:
Measured deviation as electrical angle (16 bits with sign, 182 dec corresponds to 1 °).
See also: p0491 (Motor encoder fault response ENCODER)

Remedy:
- track C or D not connected.
- correct the direction of rotation of the Hall sensor possibly connected as equivalent for track C/D.
- check that the encoder cables are routed in compliance with EMC.
- check the adjustment of the Hall sensor.

Reaction upon F: NONE (ENCODER, IASC/DCBRAKE, OFF1, OFF2, OFF3, STOP1, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

A31431 (F, N) Encoder 1: Deviation, position incremental/absolute too large

Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: When the zero pulse is passed, a deviation in the incremental position was detected. For equidistant zero marks, the following applies:
- The first zero mark passed supplies the reference point for all subsequent checks. The other zero marks must have n times the distance referred to the first zero mark.
For distance-coded zero marks, the following applies:
- the first zero mark pair supplies the reference point for all subsequent checks. The other zero mark pairs must have the expected distance to the first zero mark pair.

Alarm value (r2124, interpret decimal):
Deviation in quadrants (1 pulse = 4 quadrants).
See also: p0491 (Motor encoder fault response ENCODER)

**Remedy:**
- check that the encoder cables are routed in compliance with EMC.
- check the plug connections
- replace the encoder or encoder cable
- Clean coding disk or remove strong magnetic fields.

**Reaction upon F:** NONE (ENCODER, IASC/DCBRAKE, OFF1, OFF2, OFF3, STOP1, STOP2)
**Acknowl. upon F:** IMMEDIATELY
**Reaction upon N:** NONE
**Acknowl. upon N:** NONE

---

**A31432 (F, N) Encoder 1: Rotor position adaptation corrects deviation**

**Message value:** %1
**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** For track A/B, pulses have been lost or too many have been counted. These pulses are presently being corrected.
Alarm value (r2124, interpret decimal):
Last measured deviation of zero mark in increments (4 increments = 1 encoder pulse).
The sign designates the direction of motion when detecting the zero mark distance.

**Remedy:**
- check that the encoder cables are routed in compliance with EMC.
- check the plug connections
- replace the encoder or encoder cable
- check encoder limit frequency.
- adapt the parameter for the distance between zero marks (p0424, p0425).

**Reaction upon F:** NONE (ENCODER, IASC/DCBRAKE, OFF1, OFF2, OFF3, STOP1, STOP2)
**Acknowl. upon F:** IMMEDIATELY
**Reaction upon N:** NONE
**Acknowl. upon N:** NONE

---

**A31442 (F, N) Encoder 1: Battery voltage pre-alarm**

**Message value:** -
**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** When switched-off, the encoder uses a battery to back up the multiturn information. The battery voltage is no longer sufficient to check the multiturn information.

**Remedy:** Replace battery.

**Reaction upon F:** NONE (ENCODER, IASC/DCBRAKE, OFF1, OFF2, OFF3, STOP1, STOP2)
**Acknowl. upon F:** IMMEDIATELY
**Reaction upon N:** NONE
**Acknowl. upon N:** NONE

---

**A31443 (F, N) Encoder 1: Unipolar CD signal level outside specification**

**Message value:** Fault cause: %1 bin
**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** The unipolar level (CP/CN or DP/DN) for encoder 1 is outside the permissible tolerance.
Alarm value (r2124, binary interpretation):
Bit 0 = 1: Either CP or CN outside the tolerance.
Bit 16 = 1: Either DP or DN outside the tolerance.
The unipolar nominal signal level of the encoder must lie in the range 2500 mV +/- 500 mV.
The response thresholds are < 1700 mV and > 3300 mV.

Note:
The signal level is not evaluated unless the following conditions are satisfied:
- Sensor Module properties available (r0459.31 = 1).
- Monitoring active (p0437.31 = 1).

See also: p0491 (Motor encoder fault response ENCODER)

Remedy:
- check that the encoder cables and shielding are routed in compliance with EMC.
- check the plug connections and contacts of the encoder cable.
- are the C/D tracks connected correctly (have the signal lines CP and CN or DP and DN been interchanged)?
- replace the encoder cable.

Reaction upon F: NONE (ENCODER, IASC/DCBRAKE, OFF1, OFF2, OFF3, STOP1, STOP2)

Acknowl. upon F: IMMEDIATELY

Reaction upon N: NONE

Acknowl. upon N: NONE

<table>
<thead>
<tr>
<th>A31460 (N)</th>
<th>Encoder 1: Analog sensor channel A failed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message value:</td>
<td>%1</td>
</tr>
<tr>
<td>Drive object:</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
</tr>
<tr>
<td>Reaction:</td>
<td>NONE</td>
</tr>
<tr>
<td>Acknowledge:</td>
<td>NONE</td>
</tr>
<tr>
<td>Cause:</td>
<td>The input voltage of the analog sensor is outside the permissible limits.</td>
</tr>
<tr>
<td>Alarm value (r2124, interpret decimal):</td>
<td>1: Input voltage outside detectable measuring range. 2: Input voltage outside measuring range set in p4673. 3: The absolute value of the input voltage has exceeded the range limit (p4676).</td>
</tr>
</tbody>
</table>
| Remedy: | Re alarm value = 1: 
- check the output voltage of the analog sensor. 
Re alarm value = 2: 
- check the voltage setting for each encoder period (p4673). 
Re alarm value = 3: 
- check the range limit setting and increase it if necessary (p4676). |
| Reaction upon N: | NONE |
| Acknowl. upon N: | NONE |

<table>
<thead>
<tr>
<th>A31461 (N)</th>
<th>Encoder 1: Analog sensor channel B failed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message value:</td>
<td>%1</td>
</tr>
<tr>
<td>Drive object:</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
</tr>
<tr>
<td>Reaction:</td>
<td>NONE</td>
</tr>
<tr>
<td>Acknowledge:</td>
<td>NONE</td>
</tr>
<tr>
<td>Cause:</td>
<td>The input voltage of the analog sensor is outside the permissible limits.</td>
</tr>
<tr>
<td>Alarm value (r2124, interpret decimal):</td>
<td>1: Input voltage outside detectable measuring range. 2: Input voltage outside the measuring range set in (p4675). 3: The absolute value of the input voltage has exceeded the range limit (p4676).</td>
</tr>
</tbody>
</table>
| Remedy: | Re alarm value = 1: 
- check the output voltage of the analog sensor. 
Re alarm value = 2: 
- check the voltage setting for each encoder period (p4675). 
Re alarm value = 3: 
- check the range limit setting and increase it if necessary (p4676). |
| Reaction upon N: | NONE |
| Acknowl. upon N: | NONE |
### A31462 (N)  Encoder 1: Analog sensor, no channel active

**Message value:** %1  
**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
**Reaction:** NONE  
**Acknowledge:** NONE  
**Cause:** Channel A and B are not activated for the analog sensor.  
**Remedy:**  
- activate channel A and/or channel B (p4670).  
- check the encoder configuration (p0404.17).  
See also: p4670 (Analog sensor configuration)  
**Reaction upon N:** NONE  
**Acknowl. upon N:** NONE

### A31463 (N)  Encoder 1: Analog sensor position value exceeds limit value

**Message value:** %1  
**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
**Reaction:** NONE  
**Acknowledge:** NONE  
**Cause:** The position value has exceeded the permissible range of -0.5 ... +0.5.  
Alarm value ((2124, interpret decimal):  
1: Position value from the LVDT sensor.  
2: Position value from the encoder characteristic.  
**Remedy:**  
Re alarm value = 1:  
- Check the LVDT ratio (p4678).  
- check the reference signal connection at track B.  
Re alarm value = 2:  
- check the coefficients of the characteristic (p4663 ... p4666).  
**Reaction upon N:** NONE  
**Acknowl. upon N:** NONE

### A31470 (F, N)  Encoder 1: Soiling detected

**Message value:** -  
**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
**Reaction:** NONE  
**Acknowledge:** NONE  
**Cause:** In the case of the alternative encoder system interface on the Sensor Module Cabinet 30 (SMC30), encoder soiling is signaled via a 0 signal at terminal X521.7.  
**Remedy:**  
- check the plug connections  
- replace the encoder or encoder cable  
**Reaction upon F:** NONE (ENCODER, IASC/DCBR AKE, OFF1, OFF2, OFF3, STOP1, STOP2)  
**Acknowl. upon F:** IMMEDIATELY  
**Reaction upon N:** NONE  
**Acknowl. upon N:** NONE

### F31500 (N, A)  Encoder 1: Position tracking traversing range exceeded

**Message value:** -  
**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
**Reaction:** OFF1 (NONE, OFF2, OFF3)  
**Acknowledge:** IMMEDIATELY  
**Cause:** For a configured linear axis without modulo correction, the drive/encoder has exceeded the maximum possible traversing range. The value should be read in p0412 and interpreted as the number of motor revolutions.  
For p0411.0 = 1, the maximum traversing range for the configured linear axis is defined to be 64x (+/- 32x) of p0421.  
For p0411.3 = 1, the maximum traversing range for the configured linear axis is pre-set (default value) to the highest possible value and is +/-p0412/2 (rounded off to complete revolutions). The highest possible value depends on the pulse number (p0408) and the fine resolution (p0419).
List of faults and alarms

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SINAMICS S110 List Manual (LH7), 06/2012, 6SL3097-4AP10-0BP3

F31501 (N, A) Encoder 1: Position tracking encoder position outside tolerance window

Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF1 (NONE, OFF2, OFF3)
Acknowledge: IMMEDIATELY
Cause: When powered down, the drive/encoder was moved through a distance greater than was parameterized in the tolerance window. It is possible that there is no longer any reference between the mechanical system and encoder. Fault value (r0949, decimal interpretation):
Deviation (difference) to the last encoder position in increments of the absolute value. The sign designates the traversing direction.
Note: The deviation (difference) found is also displayed in r0477.
Remedy: Reset the position tracking as follows:
- select encoder commissioning (p0010 = 4).
- reset the position tracking as follows (p0411.2 = 1).
- de-select encoder commissioning (p0010 = 0).
The fault should then be acknowledged and, if necessary, the absolute encoder adjusted (p2507).
See also: p0010 (Drive commissioning parameter filter), p2507 (LR absolute encoder adjustment status)

A31700 Encoder 1: Effectivity test does not supply the expected value

Message value: Fault cause: %1 bin
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: The DRIVE-CLiQ encoder fault word supplies fault bits that have been set.
Fault value (r0949, interpret binary):
Bit x = 1: Effectivity test x unsuccessful.
Remedy: Replace encoder.

N31800 (F) Encoder 1: Group signal

Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: ENCODER (IASC/DCBRAKE, NONE)
Acknowledge: NONE
Cause: The motor encoder has detected at least one fault.
See also: p0491 (Motor encoder fault response ENCODER)
Remedy: Evaluate the other messages that are presently available.
Reaction upon F: ENCODER (IASC/DCBRAKE, NONE)
Acknow. upon F: IMMEDIATELY

Remedy: The fault should be resolved as follows:
- select encoder commissioning (p0010 = 4).
- reset the position tracking as follows (p0411.2 = 1).
- de-select encoder commissioning (p0010 = 0).
The fault should then be acknowledged and the absolute encoder adjusted.

Reaction upon N: NONE
Acknow. upon N: NONE
Reaction upon A: NONE
Acknow. upon A: NONE
Faults and alarms

List of faults and alarms

<table>
<thead>
<tr>
<th>F31801 (N, A)</th>
<th>Encoder 1 DRIVE-CLiQ: Sign-of-life missing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Message value:</strong></td>
<td>Component number: %1, fault cause: %2</td>
</tr>
<tr>
<td><strong>Drive object:</strong></td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
</tr>
<tr>
<td><strong>Reaction:</strong></td>
<td>ENCODER (IASC/DCBRAKE, NONE)</td>
</tr>
<tr>
<td><strong>Acknowledge:</strong></td>
<td>IMMEDIATELY</td>
</tr>
</tbody>
</table>
| **Cause:** | A DRIVE-CLiQ communication error has occurred from the Control Unit to the encoder involved. Fault value (r0949, interpret hexadecimal):
 yyyy hex: yy = component number, xx = fault cause
  xx = 0A hex:
  The sign-of-life bit in the receive telegram is not set.
  See also: p0491 (Motor encoder fault response ENCODER) |
| **Remedy:** | - check the electrical cabinet design and cable routing for EMC compliance
  - replace the component involved. |
| **Reaction upon N:** | NONE |
| **Acknowl. upon N:** | NONE |
| **Reaction upon A:** | NONE |
| **Acknowl. upon A:** | NONE |

<table>
<thead>
<tr>
<th>F31802 (N, A)</th>
<th>Encoder 1: Time slice overflow</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Message value:</strong></td>
<td>%1</td>
</tr>
<tr>
<td><strong>Drive object:</strong></td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
</tr>
<tr>
<td><strong>Reaction:</strong></td>
<td>ENCODER (IASC/DCBRAKE, NONE)</td>
</tr>
<tr>
<td><strong>Acknowledge:</strong></td>
<td>IMMEDIATELY</td>
</tr>
</tbody>
</table>
| **Cause:** | A time slice overflow has occurred in encoder 1.
  Fault value (r0949, decimal interpretation):
  9: Time slice overflow of the fast (current controller clock cycle) time slice.
  10: Time slice overflow of the average time slice.
  12: Time slice overflow of the slow time slice.
  999: Timeout when waiting for SYNO (e.g. unexpected return to non-cyclic operation).
  See also: p0491 (Motor encoder fault response ENCODER) |
| **Remedy:** | Reduce the current controller frequency. |
| **Reaction upon N:** | NONE |
| **Acknowl. upon N:** | NONE |
| **Reaction upon A:** | NONE |
| **Acknowl. upon A:** | NONE |

<table>
<thead>
<tr>
<th>F31804 (N, A)</th>
<th>Encoder 1: Checksum error</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Message value:</strong></td>
<td>%1</td>
</tr>
<tr>
<td><strong>Drive object:</strong></td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
</tr>
<tr>
<td><strong>Reaction:</strong></td>
<td>ENCODER (IASC/DCBRAKE, NONE)</td>
</tr>
<tr>
<td><strong>Acknowledge:</strong></td>
<td>IMMEDIATELY</td>
</tr>
</tbody>
</table>
| **Cause:** | A checksum error has occurred when reading-out the program memory on the Sensor Module.
  Fault value (r0949, interpret hexadecimal):
  yyyyyyyyy hex
  yyyy: Memory area involved.
  xxxx: Difference between the checksum at POWER ON and the actual checksum.
  See also: p0491 (Motor encoder fault response ENCODER) |
| **Remedy:** | - check whether the permissible ambient temperature for the component is maintained.
  - replace the Sensor Module. |
| **Reaction upon N:** | NONE |
| **Acknowl. upon N:** | NONE |
| **Reaction upon A:** | NONE |
| **Acknowl. upon A:** | NONE |
### F31805 (N, A) Encoder 1: EPROM checksum error

| Message value: | %1 |
| Drive object: | SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN |
| Reaction: | ENCODER (IASC/DCBRAKE, NONE) |
| Acknowledge: | IMMEDIATELY |
| Cause: | Internal parameter data is corrupted. Fault value (r0949, interpret hexadecimal): 01: EEPROM access error. 02: Too many blocks in the EEPROM. See also: p0491 (Motor encoder fault response ENCODER) |
| Remedy: | Replace the module. |
| Reaction upon N: | NONE |
| Acknowl. upon N: | NONE |
| Reaction upon A: | NONE |
| Acknowl. upon A: | NONE |

### F31806 (N, A) Encoder 1: Initialization error

| Message value: | %1 |
| Drive object: | SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN |
| Reaction: | ENCODER (IASC/DCBRAKE, NONE) |
| Acknowledge: | PULSE INHIBIT |
| Cause: | The encoder was not successfully initialized. Fault value (r0949, interpret hexadecimal): Bit 0, 1: Encoder initialization with the motor rotating has failed (deviation involving coarse and fine position in encoder pulses/4). Bit 2: Mid-voltage matching for track A unsuccessful. Bit 3: Mid-voltage matching for track B unsuccessful. Bit 4: Mid-voltage matching for acceleration input unsuccessful. Bit 5: Mid-voltage matching for track safety A unsuccessful. Bit 6: Mid-voltage matching for track safety B unsuccessful. Bit 7: Mid-voltage matching for track C unsuccessful. Bit 8: Mid-voltage matching for track D unsuccessful. Bit 9: Mid-voltage matching for track R unsuccessful. Bit 10: The difference in mid-voltages between A and B is too great (> 0.5 V) Bit 11: The difference in mid-voltages between C and D is too great (> 0.5 V) Bit 12: The difference in mid-voltages between safety A and safety B is too great (> 0.5 V) Bit 13: The difference in mid-voltages between A and safety B is too great (> 0.5 V) Bit 14: The difference in mid-voltages between B and safety A is too great (> 0.5 V) Bit 15: The standard deviation of the calculated mid-voltages is too great (> 0.3 V) Bit 16: Internal fault - fault reading a register (CAFE) Bit 17: Internal fault - fault writing a register (CAFE) Bit 18: Internal fault: No mid-voltage matching available Bit 19: Internal error - ADC access error. Bit 20: Internal error - no zero crossover found. Note: Bit 0, 1: Up to 6SL3055-0AA00-5*A0 Bits 2 ... 9: Check encoder power supply. Bits 2 ... 14: Check the corresponding cable. Bit 15 with no other bits: Check track R, check settings in p0404. See also: p0491 (Motor encoder fault response ENCODER) |
| Remedy: | Acknowledge the fault. If the fault cannot be acknowledged: Bits 2 ... 9: Check encoder power supply. Bits 2 ... 14: Check the corresponding cable. Bit 15 with no other bits: Check track R, check settings in p0404. |
| Reaction upon N: | NONE |
| Acknowl. upon N: | NONE |
| Reaction upon A: | NONE |
| Acknowl. upon A: | NONE |
Faults and alarms

List of faults and alarms

A31811 (F, N) Encoder 1: Encoder serial number changed

Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: The serial number of the motor encoder of a synchronous motor has changed. The change was only checked for encoders with serial number (e.g. EnDat encoders) and build-in motors (e.g. p0300 = 401) or third-party motors (p0300 = 2).

- The encoder was replaced.
- A third-party, built-in or linear motor was re-commissioned.
- The motor with integrated and adjusted encoder was replaced.
- The firmware was updated to a version that checks the encoder serial number.

Note: With closed-loop position control, the serial number is accepted when starting the adjustment (p2507 = 2). When the encoder is adjusted (p2507 = 3), the serial number is checked for changes and if required, the adjustment is reset (p2507 = 1).

Proceed as follows to hide serial number monitoring:
- set the following serial numbers for the corresponding Encoder Data Set: p0441= FF, p0442 = 0, p0442 = 0, p0444 = 0, p0445 = 0.
- parameterize F07414 as message type N (p2100, p2101).

See also: p0491 (Motor encoder fault response ENCODER)

Remedy: Re causes 1, 2:
Carry out an automatic adjustment using the pole position identification routine. Acknowledge the fault. Initiate the pole position identification routine with p1990 = 1. Then check that the pole position identification routine is correctly executed.

SERVO:
If a pole position identification technique is selected in p1980, and if p0301 does not contain a motor type with an encoder adjusted in the factory, then p1990 is automatically activated.

or
Set the adjustment via p0431. In this case, the new serial number is automatically accepted.

Mechanically adjust the encoder. Accept the new serial number with p0440 = 1.

Re causes 3, 4:
Accept the new serial number with p0440 = 1.

Reaction upon F: NONE (ENCODER, OFF2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

F31812 (N, A) Encoder 1: Requested cycle or RX-/TX timing not supported

Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF2
Acknowledge: IMMEDIATELY
Cause: A cycle requested from the Control Unit or RX/TX timing is not supported.

Fault value (r0949, decimal interpretation):
0: Application cycle is not supported.
1: DRIVE-CLIQ cycle is not supported.
2: Distance between RX and TX instants in time too low.
3: TX instant in time too early.

Remedy: POWER ON all components (switch the power off and then back on again).

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE
F31813  Encoder 1: Hardware logic unit failed
Message value: Fault cause: %1 bin
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: ENCODER (IASC/DCBRAKE, NONE)
Acknowledge: PULSE INHIBIT
Cause: The DRIVE-CLiQ encoder fault word supplies fault bits that have been set.
Fault value (r0949, interpret binary):
Bit 0: ALU watchdog has responded.
Bit 1: ALU has detected a sign-of-life error.
Remedy: Replace encoder.

F31820 (N, A)  Encoder 1 DRIVE-CLiQ: Telegram error
Message value: Component number: %1, fault cause: %2
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: ENCODER (IASC/DCBRAKE, NONE)
Acknowledge: IMMEDIATELY
Cause: A DRIVE-CLiQ communication error has occurred from the Control Unit to the encoder concerned.
Fault value (r0949, interpret hexadecimal):
xx = 01 hex: CRC error.
xx = 02 hex: Telegram is shorter than specified in the length byte or in the receive list.
xx = 03 hex: Telegram is longer than specified in the length byte or in the receive list.
xx = 04 hex: The length of the receive telegram does not match the receive list.
xx = 05 hex: The type of the receive telegram does not match the receive list.
xx = 06 hex: The address of the component in the telegram and in the receive list do not match.
xx = 07 hex: A SYNC telegram is expected - but the received telegram is not a SYNC telegram.
xx = 08 hex: No SYNC telegram is expected - but the received telegram is one.
xx = 09 hex: The error bit in the receive telegram is set.
xx = 10 hex: The receive telegram is too early.
See also: p0491 (Motor encoder fault response ENCODER)
Remedy:
- carry out a POWER ON.
- check the electrical cabinet design and cable routing for EMC compliance
- check the DRIVE-CLiQ wiring (interrupted cable, contacts, ...).
See also: p9916 (DRIVE-CLiQ data transfer error shutdown threshold slave)

F31835 (N, A)  Encoder 1 DRIVE-CLiQ: Cyclic data transfer error
Message value: Component number: %1, fault cause: %2
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: ENCODER (IASC/DCBRAKE, NONE)
Acknowledge: IMMEDIATELY
Cause: A DRIVE-CLiQ communication error has occurred from the Control Unit to the encoder concerned. The nodes do not send and receive in synchronism.
Faults and alarms

List of faults and alarms

Fault value (r0949, interpret hexadecimal):
yyyy hex: yy = component number, xx = fault cause
xx = 21 hex:
The cyclic telegram has not been received.
xx = 22 hex:
Timeout in the telegram receive list.
xx = 40 hex:
Timeout in the telegram send list.
See also: p0491 (Motor encoder fault response ENCODER)

Remedy:
- carry out a POWER ON.
- replace the component involved.
See also: p9916 (DRIVE-CLiQ data transfer error shutdown threshold slave)

Reaction upon N: NONE
Acknow. upon N: NONE
Reaction upon A: NONE
Acknow. upon A: NONE

F31836 (N, A) Encoder 1 DRIVE-CLiQ: Send error for DRIVE-CLiQ data
Message value: Component number: %1, fault cause: %2
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: ENCODER (IASC/DCBRAKE, NONE)
Acknowledge: IMMEDIATELY
Cause: A DRIVE-CLiQ communication error has occurred from the Control Unit to the encoder involved. Data were not able to be sent.
Fault value (r0949, interpret hexadecimal):
yyyy hex: yy = component number, xx = fault cause
xx = 41 hex:
Telegram type does not match send list.
See also: p0491 (Motor encoder fault response ENCODER)

Remedy:
Carry out a POWER ON.

Reaction upon N: NONE
Acknow. upon N: NONE
Reaction upon A: NONE
Acknow. upon A: NONE

F31837 (N, A) Encoder 1 DRIVE-CLiQ: Component fault
Message value: Component number: %1, fault cause: %2
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: ENCODER (IASC/DCBRAKE, NONE)
Acknowledge: IMMEDIATELY
Cause: Fault detected on the DRIVE-CLiQ component concerned. Faulty hardware cannot be excluded.
Fault value (r0949, interpret hexadecimal):
yyyy hex: yy = component number, xx = fault cause
xx = 20 hex:
Error in the telegram header.
xx = 23 hex:
Receive error: The telegram buffer memory contains an error.
xx = 42 hex:
Send error: The telegram buffer memory contains an error.
xx = 43 hex:
Send error: The telegram buffer memory contains an error.
See also: p0491 (Motor encoder fault response ENCODER)

Remedy:
- check the DRIVE-CLiQ wiring (interrupted cable, contacts, ...)
- check the electrical cabinet design and cable routing for EMC compliance
- if required, use another DRIVE-CLiQ socket (p9904).
- replace the component involved.

Reaction upon N: NONE
Acknow. upon N: NONE
List of faults and alarms

F31845 (N, A)  Encoder 1 DRIVE-CLiQ: Cyclic data transfer error
Message value: Component number: %1, fault cause: %2
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: ENCODER (IASC/DCBRAKE, NONE)
Acknowledge: IMMEDIATELY
Cause: A DRIVE-CLiQ communication error has occurred from the Control Unit to the encoder involved. Fault value (r0949, interpret hexadecimal):
   yy: component number, xx: fault cause
   xx = 0B hex:
      Synchronization error during alternating cyclic data transfer.
See also: p0491 (Motor encoder fault response ENCODER)
Remedy: Carry out a POWER ON.
See also: p9916 (DRIVE-CLiQ data transfer error shutdown threshold slave)

F31850 (N, A)  Encoder 1: Encoder evaluation, internal software error
Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: ENCODER (IASC/DCBRAKE, NONE)
Acknowledge: POWER ON
Cause: An internal software error has occurred in the Sensor Module of encoder 1. Fault value (r0949, decimal interpretation):
   1: Background time slice is blocked.
   2: Checksum over the code memory is not OK.
   10000: OEM memory of the EnDat encoder contains data that cannot be interpreted.
   11000 ... 11499: Descriptive data from EEPROM incorrect.
   11500 ... 11899: Configuration data from EEPROM incorrect.
   16000: DRIVE-CLiQ encoder initialization application error.
   16001: DRIVE-CLiQ encoder initialization ALU error.
   16002: DRIVE-CLiQ encoder HISI / SISI initialization error.
   16003: DRIVE-CLiQ encoder safety initialization error.
   16004: DRIVE-CLiQ encoder internal system error.
See also: p0491 (Motor encoder fault response ENCODER)
Remedy: - replace the Sensor Module.
   - if required, upgrade the firmware in the Sensor Module.
   - contact the Hotline.

F31851 (N, A)  Encoder 1 DRIVE-CLiQ (CU): Sign-of-life missing
Message value: Component number: %1, fault cause: %2
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: ENCODER (IASC/DCBRAKE, NONE)
Acknowledge: IMMEDIATELY
Cause: A DRIVE-CLiQ communication error has occurred from the Sensor Module (encoder 1) involved to the Control Unit. The DRIVE-CLiQ component did not set the sign-of-life to the Control Unit.
Fault and alarms

List of faults and alarms

Fault value (r0949, interpret hexadecimal):

yyxx hex: yy = component number, xx = fault cause
xx = 0A hex = 10 dec:
The sign-of-life bit in the receive telegram is not set.

Remedy:
Upgrade the firmware of the component involved.

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F31860 (N, A) Encoder 1 DRIVE-CLiQ (CU): Telegram error

Message value:
Component number: %1, fault cause: %2

Drive object:
SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

Reaction:
ENCODER (IASC/DCBRAKE, NONE)

Acknowledge:
IMMEDIATELY

Cause:
A DRIVE-CLiQ communication error has occurred from the Sensor Module (encoder 1) involved to the Control Unit.

Fault value (r0949, interpret hexadecimal):

yyxx hex: yy = component number, xx = fault cause
xx = 11 hex = 17 dec:
CRC error and the receive telegram is too early.
xx = 01 hex = 01 dec:
Checksum error (CRC error).
xx = 12 hex = 18 dec:
The telegram is shorter than that specified in the length byte or in the receive list and the receive telegram is too early.
xx = 02 hex = 02 dec:
The telegram is shorter than specified in the length byte or in the receive list.
xx = 13 hex = 19 dec:
The telegram is longer than that specified in the length byte or in the receive list and the receive telegram is too early.
xx = 03 hex = 03 dec:
The telegram is longer than specified in the length byte or in the receive list.
xx = 14 hex = 20 dec:
The length of the receive telegram does not match the receive list and the receive telegram is too early.
xx = 04 hex = 04 dec:
The length of the receive telegram does not match the receive list.
xx = 15 hex = 21 dec:
The type of the receive telegram does not match the receive list and the receive telegram is too early.
xx = 05 hex = 05 dec:
The type of the receive telegram does not match the receive list.
xx = 16 hex = 22 dec:
The address of the power unit in the telegram and in the receive list does not match and the receive telegram is too early.
xx = 06 hex = 06 dec:
The address of the power unit in the telegram and in the receive list does not match.
xx = 19 hex = 25 dec:
The error bit in the receive telegram is set and the receive telegram is too early.
xx = 09 hex = 09 dec:
The error bit in the receive telegram is set.
xx = 10 hex = 16 dec:
The receive telegram is too early.

Remedy:
- carry out a POWER ON.
- check the electrical cabinet design and cable routing for EMC compliance
- check the DRIVE-CLiQ wiring (interrupted cable, contacts, ...).
See also: p9915 (DRIVE-CLiQ data transfer error shutdown threshold master)

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE
F31885 (N, A)  Encoder 1 DRIVE-CLiQ (CU): Cyclic data transfer error

Message value: Component number: %1, fault cause: %2
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: ENCODER (IASC/DCBRAKE, NONE)
Acknowledge: IMMEDIATELY
Causes: A DRIVE-CLiQ communication error has occurred from the Sensor Module (encoder 1) involved to the Control Unit. The nodes do not send and receive in synchronism.
Fault value (r0949, interpret hexadecimal):
  yyxx hex: yy = component number, xx = fault cause
  xx = 1A hex = 26 dec:
  Sign-of-life bit in the receive telegram not set and the receive telegram is too early.
  xx = 21 hex = 33 dec:
  The cyclic telegram has not been received.
  xx = 22 hex = 34 dec:
  Timeout in the telegram receive list.
  xx = 40 hex = 64 dec:
  Timeout in the telegram send list.
  xx = 62 hex = 98 dec:
  Error at the transition to cyclic operation.
Remedy: - check the power supply voltage of the component involved.
- carry out a POWER ON.
- replace the component involved.
See also: p9915 (DRIVE-CLiQ data transfer error shutdown threshold master)

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F31886 (N, A)  Encoder 1 DRIVE-CLiQ (CU): Error when sending DRIVE-CLiQ data

Message value: Component number: %1, fault cause: %2
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: ENCODER (IASC/DCBRAKE, NONE)
Acknowledge: IMMEDIATELY
Causes: A DRIVE-CLiQ communication error has occurred from the Sensor Module (encoder 1) involved to the Control Unit. Data were not able to be sent.
Fault value (r0949, interpret hexadecimal):
  yyxx hex: yy = component number, xx = fault cause
  xx = 41 hex:
  Telegram type does not match send list.
Remedy: - carry out a POWER ON.
- check whether the firmware version of the encoder (r0148) matches the firmware version of Control Unit (r0018)

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F31887 (N, A)  Encoder 1 DRIVE-CLiQ (CU): Component fault

Message value: Component number: %1, fault cause: %2
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: ENCODER (IASC/DCBRAKE, NONE)
Acknowledge: IMMEDIATELY
Causes: Fault detected on the DRIVE-CLiQ component involved (Sensor Module for encoder 1). Faulty hardware cannot be excluded.
Fault value (r0949, interpret hexadecimal):
  yyxx hex: yy = component number, xx = fault cause
  xx = 20 hex:
  Error in the telegram header.
Faults and alarms

List of faults and alarms

xx = 23 hex:
Receive error: The telegram buffer memory contains an error.
xx = 42 hex:
Send error: The telegram buffer memory contains an error.
xx = 43 hex:
Send error: The telegram buffer memory contains an error.
xx = 60 hex:
Response received too late during runtime measurement.
xx = 61 hex:
Time taken to exchange characteristic data too long.

Remedy:
- check the DRIVE-CLiQ wiring (interrupted cable, contacts, ...).
- check the electrical cabinet design and cable routing for EMC compliance
- if required, use another DRIVE-CLiQ socket (p9904).
- replace the component involved.

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F31895 (N, A) Encoder 1 DRIVE-CLiQ (CU): Alternating cyclic data transfer error
Message value: Component number: %1, fault cause: %2
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: ENCODER (IASC/DCBRAKE, NONE)
Acknowledge: IMMEDIATELY
Cause: A DRIVE-CLiQ communication error has occurred from the Sensor Module (encoder 1) involved to the Control Unit. Fault value (r0949, interpret hexadecimal):
yyxx hex: yy = component number, xx = fault cause
xx = 0B hex:
Synchronization error during alternating cyclic data transfer.

Remedy: Carry out a POWER ON.
See also: p9915 (DRIVE-CLiQ data transfer error shutdown threshold master)

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F31896 (N, A) Encoder 1 DRIVE-CLiQ (CU): Inconsistent component properties
Message value: Component number.
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF2 (ENCODER, IASC/DCBRAKE, NONE, OFF1, OFF3, STOP1, STOP2)
Acknowledge: IMMEDIATELY
Cause: The properties of the DRIVE-CLiQ component (Sensor Module for encoder 1), specified by the fault value, have changed in an incompatible fashion with respect to the properties when booted. One cause can be, e.g. that a DRIVE-CLiQ cable or DRIVE-CLiQ component has been replaced.
 Fault value (r0949, decimal interpretation):
Component number.

Remedy:
- carry out a POWER ON.
- when a component is replaced, the same component type and if possible the same firmware version should be used.
- when a cable is replaced, only cables whose length is the same as or as close as possible to the length of the original cables should be used (ensure compliance with the maximum cable length).

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE
F31899 (N, A) Encoder 1: Unknown fault
Message value: New message: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: ENCODER (IASC/DCBRAKE, NONE, OFF1, OFF2, OFF3, STOP1, STOP2)
Acknowledge: IMMEDIATELY (POWER ON)
Cause: A fault occurred on the Sensor Module for encoder 1 that cannot be interpreted by the Control Unit firmware. This can occur if the firmware on this component is more recent than the firmware on the Control Unit. Fault value (r0949, decimal interpretation):
Fault number.
Note: If required, the significance of this new fault can be read about in a more recent description of the Control Unit. See also: p0491 (Motor encoder fault response ENCODER)
Remedy:
- replace the firmware on the Sensor Module by an older firmware version (r0148).
- upgrade the firmware on the Control Unit (r0018).

A31902 (F, N) Encoder 1: SPI-BUS error occurred
Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: Error when operating the internal SPI bus.
Fault value (r0949, interpret hexadecimal):
Only for internal Siemens troubleshooting.
Remedy:
- replace the Sensor Module.
- if required, upgrade the firmware in the Sensor Module.
- contact the Hotline.

A31903 (F, N) Encoder 1: I2C-BUS error occurred
Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: Error when operating the internal I2C bus.
Fault value (r0949, interpret hexadecimal):
Only for internal Siemens troubleshooting.
Remedy:
- replace the Sensor Module.
- if required, upgrade the firmware in the Sensor Module.
- contact the Hotline.
# List of faults and alarms

## F31905 (N, A)  Encoder 1: Parameterization error

<table>
<thead>
<tr>
<th>Message value:</th>
<th>Parameter: %1, supplementary information: %2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive object:</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
</tr>
<tr>
<td>Reaction:</td>
<td>ENCODER (IASC/DCBRAKE, NONE, OFF1, OFF2, OFF3, STOP1, STOP2)</td>
</tr>
<tr>
<td>Acknowledge:</td>
<td>IMMEDIATELY</td>
</tr>
</tbody>
</table>
| Cause:        | A parameter of encoder 1 was detected as being incorrect. It is possible that the parameterized encoder type does not match the connected encoder. The parameter involved can be determined as follows: - determine the parameter number using the fault value (r0949). - determine the parameter index (p0187). Fault value (r0949, decimal interpretation):
| yyyyxxxx dec: | yyyy = supplementary information, xxxx = parameter |
| yyyy = 1:     | The component does not support HTL level (p0405.1 = 0) combined with track monitoring A/B <> -A/B (p0405.2 = 1). |
| yyyy = 2:     | A code number for an identified encoder has been entered into p0400, however, no identification was carried out. Please start a new encoder identification. |
| yyyy = 3:     | A code number for an identified encoder has been entered into p0400, however, no identification was carried out. Please select a listed encoder in p0400 with a code number < 10000. |
| yyyy = 4:     | This component does not support SSI encoders (p0404.9 = 1) without track A/B. |
| yyyy = 5:     | For SQW encoder, value in p4686 greater than in p0425. |
| yyyy = 6:     | DRIVE-CLiQ encoder cannot be used with this firmware version. |
| yyyy = 7:     | For the SQW encoder, the Xact1 correction (p0437.2) is only permitted with equidistant zero marks. |

### Remedy:
- check whether the connected encoder type matches the encoder that has been parameterized.
- correct the parameter specified by the fault value (r0949) and p0187.
- re parameter number = 314:
- check the pole pair number and measuring gear ratio. The quotient of the "pole pair number" divided by the "measuring gear ratio" must be less than or equal to 1000 ((r0313 * p0433) / p0432 <= 1000).

| Reaction upon N: | NONE |
| Acknowl. upon N: | NONE |
| Reaction upon A: | NONE |
| Acknowl. upon A: | NONE |

## A31915 (F, N)  Encoder 1: Configuration error

<table>
<thead>
<tr>
<th>Message value:</th>
<th>%1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive object:</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
</tr>
<tr>
<td>Reaction:</td>
<td>NONE</td>
</tr>
<tr>
<td>Acknowledge:</td>
<td>NONE</td>
</tr>
</tbody>
</table>
| Cause:        | The configuration for encoder 1 is incorrect. Alarm value (r2124, interpret decimal):
| 1:             | Re-parameterization between fault/alarm is not permissible. |
| 419:           | When the fine resolution Gx_XIST2 is configured, the encoder identifies a maximum possible absolute position actual value (r0483) that can no longer be represented within 32 bits. |

### Remedy:
- Re alarm value = 1:
- No re-parameterization between fault/alarm.
- Re alarm value = 419:
- Reduce the fine resolution (p0419).

| Reaction upon F: | NONE (ENCODER, IASC/DCBRAKE) |
| Acknowl. upon F: | IMMEDIATELY |
### List of faults and alarms

**F31916 (N, A)**  
**Encoder 1: Parameterization fault**

**Message value:** Parameter: %1, supplementary information: %2

**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

**Reaction:** ENCODER (IASC/DCBRAKE, NONE, OFF1, OFF2, OFF3, STOP1, STOP2)

**Acknowledge:** IMMEDIATELY

**Cause:** A parameter of encoder 1 was detected as being incorrect. It is possible that the parameterized encoder type does not match the connected encoder. The parameter involved can be determined as follows:
- determine the parameter number using the fault value (r0949).
- determine the parameter index (p0187).

Fault value (r0949, decimal interpretation): Parameter number.

**Note:**
This fault is only output for encoders where r0404.10 = 1 or r0404.11 = 1. It corresponds to A31905 with encoders where r0404.10 = 0 and r0404.11 = 0.

See also: p0491 (Motor encoder fault response ENCODER)

**Remedy:**
- check whether the connected encoder type matches the encoder that has been parameterized.
- correct the parameter specified by the fault value (r0949) and p0187.

**Reaction upon N:** NONE  
**Acknowl. upon N:** NONE

**A31920 (F, N)**  
**Encoder 1: Temperature sensor fault**

**Message value:** Fault cause: %1, channel number: %2

**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:** When evaluating the temperature sensor, an error occurred. Alarm value (r2124, interpret decimal):
- yyyx hex: yy: channel number, xx = fault cause
- xx = 1: Wire breakage or sensor not connected (KTY: R > 1630 Ohm).
- xx = 2: Measured resistance too low (PTC: R < 20 Ohm, KTY: R < 50 Ohm).
- xx = Additional values:
  - Only for internal Siemens troubleshooting.
  - See also: p0491 (Motor encoder fault response ENCODER)

**Remedy:**
- check that the encoder cable is the correct type and is correctly connected.
- check the temperature sensor selection in p0600 to p0603.
- replace the Sensor Module (hardware defect or incorrect calibration data).

**Reaction upon F:** NONE (ENCODER, IASC/DCBRAKE, OFF1, OFF2, OFF3, STOP1, STOP2)

**Acknowl. upon F:** IMMEDIATELY

**Reaction upon N:** NONE

**A31940 (F, N)**  
**Sensor 1: Spindle clamping state error**

**Message value:** %1

**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:** The spindle clamping state is incorrect.

Fault value (r0949, decimal interpretation):
- Signal level from sensor S1.

**Note:**
A signal level of 500 mV corresponds to the numerical value 500 dec.
Faults and alarms

List of faults and alarms

Remedy:
- Check the clamped tool.
- Check the tolerance and if required, adapt (p5040).
- Check the thresholds and if required, adapt (p5041).
- Check analog sensor S1 and connections.

Reaction upon F: NONE (ENCODER, IASC/DCBRAKE, OFF1, OFF2, OFF3, STOP1, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

A31999 (F, N) Encoder 1: Unknown alarm
Message value: New message: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause:
A alarm has occurred on the Sensor Module for encoder 1 that cannot be interpreted by the Control Unit firmware.
This can occur if the firmware on this component is more recent than the firmware on the Control Unit.
Alarm value (r2124, interpret decimal):
Alarm number.
Note:
If required, the significance of this new alarm can be read about in a more recent description of the Control Unit.
See also: p0491 (Motor encoder fault response ENCODER)
Remedy:
- replace the firmware on the Sensor Module by an older firmware version (r0148).
- upgrade the firmware on the Control Unit (r0018).
Reaction upon F: NONE (ENCODER, IASC/DCBRAKE, OFF1, OFF2, OFF3, STOP1, STOP2)
Acknowl. upon F: IMMEDIATELY (POWER ON)
Reaction upon N: NONE
Acknowl. upon N: NONE

F32100 (N, A) Encoder 2: Zero mark distance error
Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF1 (IASC/DCBRAKE, NONE, OFF2, OFF3, STOP1, STOP2)
Acknowledge: PULSE INHIBIT
Cause:
The measured zero mark distance does not correspond to the parameterized zero mark distance.
For distance-coded encoders, the zero mark distance is determined from zero marks detected pairs. This means that
if a zero mark is missing, depending on the pair generation, this cannot result in a fault and also has no effect in the
system.
The zero mark distance for the zero mark monitoring is set in p0425 (rotary encoder) or p0424 (linear encoder).
Fault value (r0949, decimal interpretation):
Last measured zero mark distance in increments (4 increments = 1 encoder pulse).
The sign designates the direction of motion when detecting the zero mark distance.
Remedy:
- check that the encoder cables are routed in compliance with EMC.
- check the plug connections
  - check the encoder type (encoder with equidistant zero marks).
- adapt the parameter for the distance between zero marks (p0424, p0425).
- if message output above speed threshold, reduce filter time if necessary (p0438).
- replace the encoder or encoder cable
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE
### F32101 (N, A) Encoder 2: Zero mark failed

**Message value:** %1

**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

**Reaction:** OFF1 (IASC/DCBRAKE, NONE, OFF2, OFF3, STOP1, STOP2)

**Acknowledge:** PULSE INHIBIT

**Cause:** The 1.5 x parameterized zero mark distance was exceeded.

The zero mark distance for the zero mark monitoring is set in p0425 (rotary encoder) or p0424 (linear encoder).

Fault value (r0949, decimal interpretation):

- Number of increments after POWER ON or since the last zero mark that was detected (4 increments = 1 encoder pulse).

**Remedy:**
- check that the encoder cables are routed in compliance with EMC.
- check the plug connections
- check the encoder type (encoder with equidistant zero marks).
- adapt the parameter for the clearance between zero marks (p0425).
- if message output above speed threshold, reduce filter time if necessary (p0438).
- when p0437.1 is active, check p4686.
- replace the encoder or encoder cable

**Reaction upon N:** NONE

**Acknowl. upon N:** NONE

**Reaction upon A:** NONE

**Acknowl. upon A:** NONE

### F32103 (N, A) Encoder 2: Amplitude error, track R

**Message value:** R track: %1

**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

**Reaction:** OFF1 (IASC/DCBRAKE, NONE, OFF2, OFF3)

**Acknowledge:** IMMEDIATELY

**Cause:** The amplitude of the reference track signal (track R) does not lie within the tolerance bandwidth for encoder 2.

The fault can be initiated when the unipolar voltage level is exceeded (RP/RN) or if the differential amplitude is under-shot.

Fault value (r0949, interpret hexadecimal):

- yyyyxxxx hex: yyyy = 0, xxxx = Signal level, track R (16 bits with sign)
- The response thresholds of the unipolar signal levels of the encoder are between < 1400 mV and > 3500 mV.
- The response threshold for the differential signal level of the encoder is < -1600 mV.
- A signal level of 500 mV peak value corresponds to the numerical value 5333 hex = 21299 dec.

**Note:**

- The analog value of the amplitude error is not measured at the same time with the hardware fault output by the Sensor Module.
- The fault value can only be represented between -32767 ... 32767 dec (-770 ... 770 mV).
- The signal level is not evaluated unless the following conditions are satisfied:
  - Sensor Module properties available (r0459.31 = 1).
  - Monitoring active (p0437.31 = 1).

**Remedy:**
- check the speed range; frequency characteristic (amplitude characteristic) of the measuring equipment might not be sufficient for the speed range
- check that the encoder cables and shielding are routed in compliance with EMC.
- check the plug connections and contacts of the encoder cable.
- check whether the zero mark is connected and the signal cables RP and RN have been connected correctly
- replace the encoder cable.
- if the coding disk is soiled or the lighting aged, replace the encoder.

**Reaction upon N:** NONE

**Acknowl. upon N:** NONE

**Reaction upon A:** NONE

**Acknowl. upon A:** NONE
### List of faults and alarms

#### F32110 (N, A) Encoder 2: Serial communications error

**Message value:** Fault cause: %1 bin

**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

**Reaction:** OFF1 (IASC/DCBRAKE, NONE, OFF2, OFF3)

**Acknowledge:** PULSE INHIBIT

**Cause:** Serial communication protocol transfer error between the encoder and evaluation module.

Fault value (r0949, interpret binary):
- Bit 0: Alarm bit in the position protocol.
- Bit 1: Incorrect quiescent level on the data line.
- Bit 2: Encoder does not respond (does not supply a start bit within 50 ms).
- Bit 3: CRC error: The checksum in the protocol from the encoder does not match the data.
- Bit 4: Encoder acknowledgement error: The encoder incorrectly understood the task (request) or cannot execute it.
- Bit 5: Internal error in the serial driver: An illegal mode command was requested.
- Bit 6: Timeout when cyclically reading.
- Bit 8: Protocol is too long (e.g. > 64 bits).
- Bit 9: Receive buffer overflow.
- Bit 10: Frame error when reading twice.
- Bit 11: Parity error.
- Bit 12: Data line signal level error during the monoflop time.
- Bit 13: Data line incorrect.

**Remedy:**
- Re fault value, bit 0 = 1:
  - Enc defect F31111 may provide additional details.
- Re fault value, bit 1 = 1:
  - Incorrect encoder type / replace the encoder or encoder cable.
- Re fault value, bit 2 = 1:
  - Incorrect encoder type / replace the encoder or encoder cable.
- Re fault value, bit 3 = 1:
  - EMC / connect the cable shield, replace the encoder or encoder cable.
- Re fault value, bit 4 = 1:
  - EMC / connect the cable shield, replace the encoder or encoder cable, replace the Sensor Module.
- Re fault value, bit 5 = 1:
  - EMC / connect the cable shield, replace the encoder or encoder cable, replace the Sensor Module.
- Re fault value, bit 6 = 1:
  - Update Sensor Module firmware.
- Re fault value, bit 8 = 1:
  - Check parameterization (p0429.2).
- Re fault value, bit 9 = 1:
  - EMC / connect the cable shield, replace the encoder or encoder cable, replace the Sensor Module.
- Re fault value, bit 10 = 1:
  - Check parameterization (p0429.2, p0449).
- Re fault value, bit 11 = 1:
  - Check parameterization (p0436).
- Re fault value, bit 12 = 1:
  - Check parameterization (p0429.6).
- Re fault value, bit 13 = 1:
  - Check data line.

**Reaction upon N:** NONE

**Acknowl. upon N:** NONE

**Reaction upon A:** NONE

**Acknowl. upon A:** NONE

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#### F32111 (N, A) Encoder 2: Absolute encoder EnDat, internal fault/error

**Message value:** Fault cause: %1 bin

**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

**Reaction:** OFF1 (IASC/DCBRAKE, NONE, OFF2, OFF3)

**Acknowledge:** PULSE INHIBIT

**Cause:** The EnDat encoder fault word supplies fault bits that have been set.

Fault value (r0949, interpret binary):
- Bit 0: Lighting system failed.
- Bit 1: Signal amplitude too low.
Bit 2: Position value incorrect.
Bit 3: Encoder power supply overvoltage condition.
Bit 4: Encoder power supply undervoltage condition.
Bit 5: Encoder power supply overcurrent condition.
Bit 6: The battery must be changed.

Remedy:  
Re fault value, bit 0 = 1:
Encoder is defective. Replace the encoder, where the motor encoder has a direct DRIVE-CLiQ socket: Replace the motor.
Re fault value, bit 1 = 1:
Encoder is defective. Replace the encoder, where the motor encoder has a direct DRIVE-CLiQ socket: Replace the motor.
Re fault value, bit 2 = 1:
Encoder is defective. Replace the encoder, where the motor encoder has a direct DRIVE-CLiQ socket: Replace the motor.
Re fault value, bit 3 = 1:
5 V power supply voltage fault.
When using an SMC: Check the plug-in cable between the encoder and SMC or replace the SMC.
When a motor encoder with a direct DRIVE-CLiQ connection is used: Replace the motor.
Re fault value, bit 4 = 1:
5 V power supply voltage fault.
When using an SMC: Check the plug-in cable between the encoder and SMC or replace the SMC.
When using a motor with DRIVE-CLiQ: Replace the motor.
Re fault value, bit 5 = 1:
Encoder is defective. Replace the encoder, where the motor encoder has a direct DRIVE-CLiQ socket: Replace the motor.
Re fault value, bit 6 = 1:
The battery must be changed (only for encoders with battery back-up).

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F32112 (N, A) Encoder 2: Error bit set in the serial protocol
Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF1 (IASC/DCBRAKE, NONE, OFF2, OFF3)
Acknowledge: PULSE INHIBIT
Cause: The encoder sends a set error bit via the serial protocol.
Fault value (r0949, interpret binary):
Bit 0: Fault bit in the position protocol.
Remedy: For fault value, bit 0 = 1:
In the case of an EnDat encoder, F31111 may provide further details.
Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F32115 (N, A) Encoder 2: Amplitude error track A or B (A^2 + B^2)
Message value: A track: %1, B-track: %2
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF1 (IASC/DCBRAKE, NONE, OFF2, OFF3)
Acknowledge: PULSE INHIBIT
Cause: The amplitude (root of A^2 + B^2) for encoder 2 exceeds the permissible tolerance.
Fault value (r0949, interpret hexadecimal):
yyyyxxxx hex:
yyyy = Signal level, track B (16 bits with sign).
xxxx = Signal level, track A (16 bits with sign).
The nominal signal level of the encoder must lie in the range 375 mV to 600 mV (500 mV -25/+20 %).
The response thresholds are < 230 mV (observe the frequency response of the encoder) and > 750 mV.

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE
Faults and alarms

List of faults and alarms

A signal level of 500 mV peak value corresponds to the numerical value 5333 hex = 21299 dec.
Note for sensors modules for resolvers (e.g. SMC10):
The nominal signal level is at 2900 mV (2.0 Vrms). The response thresholds are < 1070 mV and > 3582 mV.
A signal level of 2900 mV peak value corresponds to the numerical value 6666 hex = 26214 dec.
Note:
The analog values of the amplitude error are not measured at the same time with the hardware fault output by the
Sensor Module.

Remedy:
- check that the encoder cables and shielding are routed in compliance with EMC.
- check the plug connections
- replace the encoder or encoder cable
- check the Sensor Module (e.g. contacts).
The following applies to measuring systems without their own bearing system:
- adjust the scanning head and check the bearing system of the measuring wheel.
The following applies for measuring systems with their own bearing system:
- ensure that the encoder housing is not subject to any axial force.

F32116 (N, A) Encoder 2: Amplitude error monitoring track A + B
Message value: Amplitude: %1, Angle: %2
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF1 (IASC/DCBRAKE, NONE, OFF2, OFF3)
Acknowledge: IMMEDIATELY
Cause: The amplitude of the rectified encoder signals A and B and the amplitude from the roots of \(A^2 + B^2\) for encoder 2
are not within the tolerance bandwidth.
Fault value (r0949, interpret hexadecimal):
\(yyyyxxxx\) hex:
\(yyyy\) = Signal level, track B (16 bits with sign).
\(xxxx\) = Signal level, track A (16 bits with sign).
The nominal signal level of the encoder must lie in the range 375 mV to 600 mV (500 mV -25/+20 %).
The response thresholds are < 176 mV (observe the frequency response of the encoder) and > 955 mV.
A signal level of 500 mV peak value corresponds to the numerical value 5333 hex = 21299 dec.
Note:
The analog values of the amplitude error are not measured at the same time with the hardware fault output by the
Sensor Module.

Remedy:
- check that the encoder cables and shielding are routed in compliance with EMC.
- check the plug connections
- replace the encoder or encoder cable
- check the Sensor Module (e.g. contacts).

F32117 (N, A) Encoder 2: Inversion error signals A/B/R
Message value: Fault cause: %1 bin
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF1 (IASC/DCBRAKE, NONE, OFF2, OFF3)
Acknowledge: IMMEDIATELY
Cause: For a square-wave encoder (bipolar, double ended) signals \(A^*, B^*\) and \(R^*\) are not inverted with respect to signals A, B and R.
Fault value (r0949, interpret binary):
Bits 0 ... 15: Only for internal Siemens troubleshooting.
Bit 16: Error track A.
Bit 17: Error track B.
Bit 18: Error track R.
Note:
For SMC30 (order no. 6SL3055-0AA00-5CA0 and 6SL3055-0AA00-5CA1 only), CUA32, and CU310, the following applies: A square-wave encoder without track R is used and track monitoring (p0405.2 = 1) is activated.

Remedy:
- Check the encoder/cable.
- Does the encoder supply signals and the associated inverted signals?

Note:
For SMC30 (order no. 6SL3055-0AA00-5CA0 and 6SL3055-0AA00-5CA1 only), the following applies:
- check the setting of p0405 (p0405.2 = 1 is only possible if the encoder is connected at X520).
For a square-wave encoder without track R, the following jumpers must be set for the connection at X520 (SMC30) or X23 (CUA32, CU310):
- pin 10 (reference signal R) <-> pin 7 (encoder power supply, ground)
- pin 11 (reference signal R inverted) <-> pin 4 (encoder power supply)

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F32118 (N, A) Encoder 2: Speed difference outside the tolerance range
Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF1 (IASC/DCBRAKE, NONE, OFF2, OFF3)
Acknowledge: PULSE INHIBIT
Cause: For an HTL/TTL encoder, the speed difference has exceeded the value in p0492 over several sampling cycles. The change to the averaged speed actual value - if applicable - is monitored in the current controller sampling time. Fault value (r0949, decimal interpretation):
Only for internal Siemens troubleshooting. See also: p0492 (Square-wave encoder, maximum speed difference per sampling cycle)
Remedy:
- check the tachometer feeder cable for interruptions.
- check the grounding of the tachometer shielding.
- if required, increase the maximum speed difference per sampling cycle (p0492).

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F32120 (N, A) Encoder 2: Power supply voltage fault
Message value: Fault cause: %1 bin
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF1 (IASC/DCBRAKE, NONE, OFF2, OFF3)
Acknowledge: PULSE INHIBIT
Cause: A power supply fault was detected for encoder 2.
Fault value (r0949, interpret binary):
Bit 0: Undervoltage condition on the sense line.
Bit 1: Overcurrent condition for the encoder power supply.
Bit 2: Overcurrent condition for encoder power supply on cable resolver excitation negative.
Bit 3: Overcurrent condition for encoder power supply on cable resolver excitation positive.
Note: If the encoder cables 6FX2002-2EQ00-.... and 6FX2002-2CH00-.... are interchanged, this can result in the encoder being destroyed because the pins of the operating voltage are reversed.
Remedy:
Re fault value, bit 0 = 1:
- correct encoder cable connected?
- check the plug connections of the encoder cable.
- SMC30: Check the parameterization (p0404.22).
Re fault value, bit 1 = 1:
- correct encoder cable connected?
- replace the encoder or encoder cable
Faults and alarms

List of faults and alarms

Re fault value, bit 2 = 1:
- correct encoder cable connected?
- replace the encoder or encoder cable
Re fault value, bit 3 = 1:
- correct encoder cable connected?
- replace the encoder or encoder cable

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F32121 (N, A) Encoder 2: Coarse position error
Message value: -
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF1 (NONE, OFF2, OFF3)
Acknowledge: PULSE INHIBIT
Cause: For the actual value sensing, an error was detected on the module.
As a result of this error, it must be assumed that the actual value sensing supplies an incorrect coarse position.
Remedy: Replace the motor with DRIVE-CLiQ or the appropriate Sensor Module.

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F32122 Encoder 2: Internal power supply voltage faulty
Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: ENCODER
Acknowledge: IMMEDIATELY
Cause: Fault in internal reference voltage of ASICs for encoder 2.
Fault value (r0949, decimal interpretation):
1: Reference voltage error.
2: Internal undervoltage.
3: Internal overvoltage.
Remedy: Replace the motor with DRIVE-CLiQ or the appropriate Sensor Module.

F32123 (N, A) Encoder 2: Signal level A/B unipolar outside tolerance
Message value: Fault cause: %1 bin
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF1 (IASC/DCBRAKE, NONE, OFF2, OFF3)
Acknowledge: IMMEDIATELY
Cause: The unipolar level (AP/AN or BP/BN) for encoder 2 is outside the permissible tolerance.
Fault value (r0949, interpret binary):
Bit 0 = 1: Either AP or AN outside the tolerance.
Bit 16 = 1: Either BP or BN outside the tolerance.
The unipolar nominal signal level of the encoder must lie in the range 2500 mV +/- 500 mV.
The response thresholds are < 1700 mV and > 3300 mV.
Note: The signal level is not evaluated unless the following conditions are satisfied:
- Sensor Module properties available (r0459.31 = 1).
- Monitoring active (p0437.31 = 1).
Remedy: - make sure that the encoder cables and shielding are installed in an EMC-compliant manner.
- check the plug connections and contacts of the encoder cable.
- check the short-circuit of a signal cable with mass or the operating voltage.
- replace the encoder cable.

Reaction upon N: NONE
Acknowl. upon N: NONE
**F32125 (N, A)**  
**Encoder 2: Amplitude error track A or B overcontrolled**

- **Message value:** A track: %1, B-track: %2  
- **Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
- **Reaction:** OFF1 (IASC/DCBRAKE, NONE, OFF2, OFF3, STOP1, STOP2)  
- **Acknowledge:** PULSE INHIBIT  
- **Cause:** The amplitude of track A or B for encoder 2 exceeds the permissible tolerance band.  
  Fault value (r0949, interpret hexadecimal):  
  yyyyxxxx hex:  
  yyyy = Signal level, track B (16 bits with sign),  
  xxxx = Signal level, track A (16 bits with sign).  
  The nominal signal level of the encoder must lie in the range 375 mV to 600 mV (500 mV -25/+20 %).  
  The response threshold is > 750 mV. This fault also occurs if the A/D converter is overcontrolled.  
  A signal level of 500 mV peak value corresponds to the numerical value 5333 hex = 21299 dec.  
  Note for sensors modules for resolvers (e.g. SMC10):  
  The nominal signal level is at 2900 mV (2.0 Vrms). The response threshold is > 3582 mV.  
  A signal level of 2900 mV peak value corresponds to the numerical value 6666 hex = 26214 dec.  
- **Remedy:**  
  - check that the encoder cables and shielding are routed in compliance with EMC.  
  - replace the encoder or encoder cable  
- **Reaction upon N:** NONE  
- **Acknowl. upon N:** NONE  
- **Reaction upon A:** NONE  
- **Acknowl. upon A:** NONE

**F32126 (N, A)**  
**Encoder 2: Amplitude AB too high**

- **Message value:** Amplitude: %1, Angle: %2  
- **Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
- **Reaction:** OFF1 (IASC/DCBRAKE, NONE, OFF2, OFF3, STOP1, STOP2)  
- **Acknowledge:** PULSE INHIBIT  
- **Cause:** The amplitude (root of A^2 + B^2 or |A| + |B|) for encoder 2 exceeds the permissible tolerance.  
  Fault value (r0949, interpret hexadecimal):  
  yyyyxxxx hex:  
  yyyy = Angle  
  xxxx = Amplitude, i.e. root from A^2 + B^2 (16 bits without sign)  
  The nominal signal level of the encoder must lie in the range 375 mV to 600 mV (500 mV -25/+20 %).  
  The response threshold for (|A| + |B|) is > 1120 mV or the root of (A^2 + B^2) > 955 mV.  
  A signal level of 500 mV peak value corresponds to the numerical value of 299A hex = 10650 dec.  
  The angle 0 … FFFF hex corresponds to 0 … 360 degrees of the fine position. Zero degrees is at the negative zero crossover of track B.  
- **Remedy:**  
  - check that the encoder cables and shielding are routed in compliance with EMC.  
  - replace the encoder or encoder cable  
- **Reaction upon N:** NONE  
- **Acknowl. upon N:** NONE  
- **Reaction upon A:** NONE  
- **Acknowl. upon A:** NONE
### F32129 (N, A)
**Fault 2: Position difference, hall sensor/track C/D and A/B too large**

**Message value:** %1

**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

**Reaction:** OFF1 (IASC/DCBRAKE, NONE, OFF2, OFF3)

**Acknowledge:** PULSE INHIBIT

**Cause:**
- The error for track C/D is greater than +/-15 ° mechanical or +/-60 ° electrical or the error for the Hall signals is greater than +/-60 ° electrical.
- One period of track C/D corresponds to 360 ° mechanical.
- One period of the Hall signal corresponds to 360 ° electrical.
- The monitoring responds if, for example, Hall sensors are connected as equivalent for the C/D tracks with the incorrect rotational sense or supply values that are not accurate enough.
- After the fine synchronization using one reference mark or 2 reference marks for distance-coded encoders, this fault is no longer initiated, but instead, Alarm A32429.

**Fault value (r0949, decimal interpretation):**
- For track C/D, the following applies:
  - Measured deviation as mechanical angle (16 bits with sign, 182 dec corresponds to 1 °).
- For Hall signals, the following applies:
  - Measured deviation as electrical angle (16 bits with sign, 182 dec corresponds to 1 °).

**Remedy:**
- track C or D not connected.
- correct the direction of rotation of the Hall sensor possibly connected as equivalent for track C/D.
- check that the encoder cables are routed in compliance with EMC.
- check the adjustment of the Hall sensor.

**Reaction upon N:** NONE
**Acknowl. upon N:** NONE

**Reaction upon A:** NONE
**Acknowl. upon A:** NONE

### F32130 (N, A)
**Fault 2: Zero mark and position error from the coarse synchronization**

**Message value:** Angular deviation, electrical: %1, angle, mechanical: %2

**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

**Reaction:** OFF1 (IASC/DCBRAKE, NONE, OFF2, OFF3, STOP1, STOP2)

**Acknowledge:** PULSE INHIBIT

**Cause:**
- After initializing the pole position using track C/D, Hall signals or pole position identification routine, the zero mark was detected outside the permissible range. For distance-coded encoders, the test is carried out after passing 2 zero marks. Fine synchronization was not carried out.
- When initializing via track C/D (p0404) then it is checked whether the zero mark occurs in an angular range of +/-18 ° mechanical.
- When initializing via Hall sensors (p0404) or pole position identification (p1982) it is checked whether the zero mark occurs in an angular range of +/-60 ° electrical.
- Fault value (r0949, interpret hexadecimal):
  - yyyyyy hex
  - xxxx: Determined mechanical zero mark position (can only be used for track C/D).
  - Deviation of the zero mark from the expected position as electrical angle.
- Scaling: 32768 dec = 180 °

**Remedy:**
- check that the encoder cables are routed in compliance with EMC.
- check the plug connections
- if the Hall sensor is used as an equivalent for track C/D, check the connection.
- Check the connection of track C or D.
- replace the encoder or encoder cable

**Reaction upon N:** NONE
**Acknowl. upon N:** NONE

**Reaction upon A:** NONE
**Acknowl. upon A:** NONE
F32131 (N, A) Encoder 2: Deviation, position incremental/absolute too large

Message value: %1

Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

Reaction: OFF1 (IASC/DCBRAKE, NONE, OFF2, OFF3, STOP1, STOP2)

Acknowledge: PULSE INHIBIT

Cause: Absolute encoder:
When cyclically reading the absolute position, an excessively high difference to the incremental position was detected. The absolute position that was read is rejected.

Limit value for the deviation:
- EnDat encoder: Is supplied from the encoder and is a minimum of 2 quadrants (e.g. EQI 1325 > 2 quadrants, EQN 1325 > 50 quadrants).
- other encoders: 15 pulses = 60 quadrants.

Incremental encoder:
When the zero pulse is passed, a deviation in the incremental position was detected.

For equidistant zero marks, the following applies:
- The first zero mark passed supplies the reference point for all subsequent checks. The other zero marks must have n times the distance referred to the first zero mark.

For distance-coded zero marks, the following applies:
- the first zero mark pair supplies the reference point for all subsequent checks. The other zero mark pairs must have the expected distance to the first zero mark pair.

Fault value (r0949, decimal interpretation):
Deviation in quadrants (1 pulse = 4 quadrants).

Remedy:
- check that the encoder cables are routed in compliance with EMC.
- check the plug connections
- replace the encoder or encoder cable
- check whether the coding disk is dirty or there are strong ambient magnetic fields.
- adapt the parameter for the clearance between zero marks (p0425).
- if message output above speed threshold, reduce filter time if necessary (p0438).

Reaction upon N: NONE
Acknowledl. upon N: NONE
Reaction upon A: NONE
Acknowledl. upon A: NONE

F32135 Encoder 2: Fault when determining the position

Message value: Fault cause: %1 bin

Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

Reaction: OFF1 (IASC/DCBRAKE, NONE, OFF2, OFF3)

Acknowledge: PULSE INHIBIT

Cause: The DRIVE-CLiQ encoder supplies status information via bits in an internal status/fault word. Some of these bits cause this fault to be triggered. Other bits are status displays. The status/fault word is displayed in the fault value.

Fault value (r0949, interpret binary):
Bit 0: F1 (safety status display)
Bit 1: F2 (safety status display)
Bit 2: Lighting (reserved)
Bit 3: Signal amplitude (reserved)
Bit 4: Position value (reserved)
Bit 5: Overvoltage (reserved)
Bit 6: Undervoltage (reserved)
Bit 7: Overcurrent (reserved)
Bit 8: Battery (reserved)
Bit 16: Lighting (→ F3x135, x = 1, 2, 3)
Bit 17: Signal amplitude (→ F3x135, x = 1, 2, 3)
Bit 18: Singleturn position 1 (→ F3x135, x = 1, 2, 3)
Bit 19: Overvoltage (→ F3x135, x = 1, 2, 3)
Bit 20: Undervoltage (→ F3x135, x = 1, 2, 3)
Bit 21: Overcurrent (→ F3x135, x = 1, 2, 3)
Bit 22: Temperature exceeded (→ F3x405, x = 1, 2, 3)
Bit 23: Singleturn position 2 (safety status display)
Bit 24: Singleturn system (→ F3x135, x = 1, 2, 3)
### Faults and alarms

#### List of faults and alarms

Bit 25: Singleturn power down (→ F3x135, x = 1, 2, 3)
Bit 26: Multiturn position 1 (→ F3x136, x = 1, 2, 3)
Bit 27: Multiturn position 2 (→ F3x136, x = 1, 2, 3)
Bit 28: Multiturn system (→ F3x136, x = 1, 2, 3)
Bit 29: Multiturn power down (→ F3x136, x = 1, 2, 3)
Bit 30: Multiturn overflow/underflow (→ F3x136, x = 1, 2, 3)
Bit 31: Multiturn battery (reserved)

**Remedy:** Replace DRIVE-CLiQ encoder.

---

**F32136**  
**Encoder 2: Error when determining multiturn information**

**Message value:** Fault cause: %1 bin  
**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
**Reaction:** OFF1 (IASC/DCBRAKE, NONE, OFF2, OFF3)  
**Acknowledge:** PULSE INHIBIT  
**Cause:** The DRIVE-CLiQ encoder supplies status information via bits in an internal status/fault word. Some of these bits cause this fault to be triggered. Other bits are status displays. The status/fault word is displayed in the fault value. Fault value (r0949, interpret binary):
- Bit 0: F1 (safety status display)
- Bit 1: F2 (safety status display)
- Bit 2: Lighting (reserved)
- Bit 3: Signal amplitude (reserved)
- Bit 4: Position value (reserved)
- Bit 5: Overvoltage (reserved)
- Bit 6: Undervoltage (reserved)
- Bit 7: Overcurrent (reserved)
- Bit 8: Battery (reserved)
- Bit 16: Lighting (→ F3x135, x = 1, 2, 3)
- Bit 17: Signal amplitude (→ F3x135, x = 1, 2, 3)
- Bit 18: Singleturn position 1 (→ F3x135, x = 1, 2, 3)
- Bit 19: Overvoltage (→ F3x135, x = 1, 2, 3)
- Bit 20: Undervoltage (→ F3x135, x = 1, 2, 3)
- Bit 21: Overcurrent (→ F3x135, x = 1, 2, 3)
- Bit 22: Temperature exceeded (→ F3x405, x = 1, 2, 3)
- Bit 23: Singleturn position 2 (safety status display)
- Bit 24: Singleturn system (→ F3x135, x = 1, 2, 3)
- Bit 25: Singleturn power down (→ F3x135, x = 1, 2, 3)
- Bit 26: Multiturn position 1 (→ F3x136, x = 1, 2, 3)
- Bit 27: Multiturn position 2 (→ F3x136, x = 1, 2, 3)
- Bit 28: Multiturn system (→ F3x136, x = 1, 2, 3)
- Bit 29: Multiturn power down (→ F3x136, x = 1, 2, 3)
- Bit 30: Multiturn overflow/underflow (→ F3x136, x = 1, 2, 3)
- Bit 31: Multiturn battery (reserved)

**Remedy:** Replace DRIVE-CLiQ encoder.

---

**F32137**  
**Encoder 2: Internal fault when determining the position**

**Message value:** Fault cause: %1 bin  
**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
**Reaction:** OFF1 (IASC/DCBRAKE, NONE, OFF2, OFF3)  
**Acknowledge:** PULSE INHIBIT  
**Cause:** The DRIVE-CLiQ encoder fault word supplies fault bits that have been set. Fault value (r0949, interpret binary):
- Only for internal Siemens troubleshooting.

**Remedy:** Replace encoder.
F32138 Encoder 2: Internal error when determining multiturn information
Message value: Fault cause: %1 bin
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF1 (IASC/DCBRAKE, NONE, OFF2, OFF3)
Acknowledge: PULSE INHIBIT
Cause: The DRIVE-CLiQ encoder fault word supplies fault bits that have been set.
Fault value (r0949, interpret binary):
Only for internal SIEMENS troubleshooting.
Remedy: Replace encoder.

F32150 (N, A) Encoder 2: Initialization error
Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF1 (IASC/DCBRAKE, NONE, OFF2, OFF3, STOP1, STOP2)
Acknowledge: PULSE INHIBIT
Cause: Encoder functionality selected in p0404 is not operating correctly.
Fault value (r0949, interpret hexadecimal):
Encoder malfunction.
The bit assignment corresponds to that of p0404 (e.g. bit 5 set: Error track C/D).
Remedy: - Check that p0404 is correctly set.
- check the encoder type used (incremental/absolute) and for SMCxx, the encoder cable.
- if relevant, note additional fault messages that describe the fault in detail.

F32151 (N, A) Encoder 2: Encoder speed for initialization AB too high
Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: ENCODER (IASC/DCBRAKE, NONE, OFF1, OFF2, OFF3, STOP1, STOP2)
Acknowledge: PULSE INHIBIT
Cause: The encoder speed is too high during while initializing the sensor.
Remedy: Reduce the speed of the encoder accordingly during initialization.
If necessary, de-activate monitoring (p0437.29).
See also: p0437 (Sensor Module configuration extended)

F32160 (N, A) Encoder 2: Analog sensor channel A failed
Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: ENCODER (IASC/DCBRAKE, NONE)
Acknowledge: PULSE INHIBIT
Cause: The input voltage of the analog sensor is outside the permissible limits.
Fault value (r0949, decimal interpretation):
1: Input voltage outside detectable measuring range.
2: Input voltage outside the measuring range set in (p4673).
3: The absolute value of the input voltage has exceeded the range limit (p4676).
Remedy: For fault value = 1:
- check the output voltage of the analog sensor.
For fault value = 2:
- check the voltage setting for each encoder period (p4673).
### Faults and alarms

### List of faults and alarms

<table>
<thead>
<tr>
<th>Fault Code</th>
<th>Description</th>
<th>Message value</th>
<th>Drive object</th>
<th>Reaction</th>
<th>Acknowledge</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>F32161 (N, A)</strong> Encoder 2: Analog sensor channel B failed</td>
<td>%1</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>ENCODER (IASC/DCBRAKE, NONE)</td>
<td>PULSE INHIBIT</td>
<td>The input voltage of the analog sensor is outside the permissible limits. Fault value (r0949, decimal interpretation): 1: Input voltage outside detectable measuring range. 2: Input voltage outside the measuring range set in (p4675). 3: The absolute value of the input voltage has exceeded the range limit (p4676).</td>
<td>For fault value = 1: - check the output voltage of the analog sensor. For fault value = 2: - check the voltage setting for each encoder period (p4675). For fault value = 3: - check the range limit setting and increase it if necessary (p4676).</td>
<td></td>
</tr>
<tr>
<td><strong>F32163 (N, A)</strong> Encoder 2: Analog sensor position value exceeds limit value</td>
<td>%1</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>ENCODER (IASC/DCBRAKE, NONE)</td>
<td>PULSE INHIBIT</td>
<td>The position value has exceeded the permissible range of -0.5 ... +0.5. Fault value (r0949, decimal interpretation): 1: Position value from the LVDT sensor. 2: Position value from the encoder characteristic.</td>
<td>For fault value = 1: - check the LVDT ratio (p4678). - check the reference signal connection at track B. For fault value = 2: - check the coefficients of the characteristic (p4663 ... p4666).</td>
<td></td>
</tr>
<tr>
<td><strong>A32400 (F, N)</strong> Encoder 2: Alarm threshold zero mark distance error</td>
<td>%1</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>NONE</td>
<td>NONE</td>
<td>The measured zero mark distance does not correspond to the parameterized zero mark distance. For distance-coded encoders, the zero mark distance is determined from zero marks detected pairs. This means that if a zero mark is missing, depending on the pair generation, this cannot result in a fault and also has no effect in the system. The zero mark distance for the zero mark monitoring is set in p0425 (rotary encoder) or p0424 (linear encoder).</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
List of faults and alarms

**Faults and alarms**

Fault value (r2124, interpret decimal):
Last measured zero mark distance in increments (4 increments = 1 encoder pulse).
The sign designates the direction of motion when detecting the zero mark distance.

**Remedy:**
- check the encoder cables are routed in compliance with EMC.
- check the plug connections
- check the encoder type (encoder with equidistant zero marks).
- adapt the parameter for the distance between zero marks (p0424, p0425).
- replace the encoder or encoder cable

**Reaction upon F:** NONE (IASC/DCBRAKE, OFF1, OFF2, OFF3, STOP1, STOP2)  
**Acknowl. upon F:** IMMEDIATELY  
**Reaction upon N:** NONE  
**Acknowl. upon N:** NONE

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**A32401 (F, N) Encoder 2: Alarm threshold zero mark failed**

**Message value:** %1  
**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
**Reaction:** NONE  
**Acknowledge:** NONE  
**Cause:**  
The 1.5 x parameterized zero mark distance was exceeded.  
The zero mark distance for the zero mark monitoring is set in p0425 (rotary encoder) or p0424 (linear encoder).  
Alarm value (r2124, interpret decimal):
Number of increments after POWER ON or since the last zero mark that was detected (4 increments = 1 encoder pulse).

**Remedy:**
- check that the encoder cables are routed in compliance with EMC.
- check the plug connections
- check the encoder type (encoder with equidistant zero marks).
- adapt the parameter for the clearance between zero marks (p0425).
- replace the encoder or encoder cable

**Reaction upon F:** NONE (IASC/DCBRAKE, OFF1, OFF2, OFF3, STOP1, STOP2)  
**Acknowl. upon F:** IMMEDIATELY  
**Reaction upon N:** NONE  
**Acknowl. upon N:** NONE

---

**F32405 (N, A) Encoder 2: Temperature in the encoder evaluation inadmissible**

**Message value:** %1  
**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
**Reaction:** ENCODER (IASC/DCBRAKE, NONE, OFF1, OFF2, OFF3, STOP1, STOP2)  
**Acknowledge:** IMMEDIATELY (POWER ON)  
**Cause:**  
The encoder evaluation for a motor with DRIVE-CLiQ has detected an inadmissible temperature.  
The fault threshold is 125 °C.  
Alarm value (r2124, interpret decimal):
Measured board/module temperature in 0.1 °C.

**Remedy:** Reduce the ambient temperature for the DRIVE-CLiQ connection of the motor.

**Reaction upon N:** NONE  
**Acknowl. upon N:** NONE  
**Reaction upon A:** NONE  
**Acknowl. upon A:** NONE

---

**A32407 (F, N) Encoder 2: Function limit reached**

**Message value:** %1  
**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
**Reaction:** NONE  
**Acknowledge:** NONE  
**Cause:**  
The encoder has reached one of its function limits. A service is recommended.
Faults and alarms

List of faults and alarms

Alarm value (r2124, interpret decimal):
1 : Incremental signals
3 : Absolute track
4 : Code connection

Remedy:
Perform service. Replace the encoder if necessary.

Note:
The current functional reserve of an encoder can be displayed via r4651.
See also: p4650 (Encoder functional reserve component number), r4651 (Encoder functional reserve)

Reaction upon F: NONE (ENCODER, IASC/DCBRAKE, OFF1, OFF2, OFF3, STOP1, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

A32410 (F, N) Encoder 2: Serial communications
Message value: Fault cause: %1 bin
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: Serial communication protocol transfer error between the encoder and evaluation module.
Alarm value (r2124, binary interpretation):
Bit 0: Alarm bit in the position protocol.
Bit 1: Incorrect quiescent level on the data line.
Bit 2: Encoder does not respond (does not supply a start bit within 50 ms).
Bit 3: CRC error: The checksum in the protocol from the encoder does not match the data.
Bit 4: Encoder acknowledgement error: The encoder incorrectly understood the task (request) or cannot execute it.
Bit 5: Internal error in the serial driver: An illegal mode command was requested.
Bit 6: Timeout when cyclically reading.
Bit 8: Protocol is too long (e.g. > 64 bits).
Bit 9: Receive buffer overflow.
Bit 10: Frame error when reading twice.
Bit 11: Parity error.
Bit 12: Data line signal level error during the monoflop time.

Remedy:
- check that the encoder cables are routed in compliance with EMC.
- check the plug connections
- replace the encoder.

Reaction upon F: NONE (IASC/DCBRAKE, OFF1, OFF2, OFF3, STOP1, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

A32411 (F, N) Encoder 2: EnDat encoder signals alarms
Message value: Fault cause: %1 bin
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: The error word of the EnDat encoder has alarm bits that have been set.
Alarm value (r2124, binary interpretation):
Bit 0: Frequency exceeded (speed too high).
Bit 1: Temperature exceeded.
Bit 2: Control reserve, lighting system exceeded.
Bit 3: Battery discharged.
Bit 4: Reference point passed.

Remedy:
Replace encoder.

Reaction upon F: NONE (IASC/DCBRAKE, OFF1, OFF2, OFF3, STOP1, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE
### A32412 (F, N) Encoder 2: Error bit set in the serial protocol

- **Message value:** %1
- **Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
- **Reaction:** NONE
- **Acknowledge:** NO
- **Cause:** The encoder sends a set error bit via the serial protocol.
  - Alarm value (r2124, binary interpretation):
    - Bit 0: Fault bit in the position protocol.
    - Bit 1: Alarm bit in the position protocol.
- **Remedy:**
  - carry out a POWER ON (power off/on) for all components.
  - check that the encoder cables are routed in compliance with EMC.
  - check the plug connections
  - replace the encoder.
- **Reaction upon F:** NONE (IASC/DCBRAKE, OFF1, OFF2, OFF3, STOP1, STOP2)
- **Acknowl. upon F:** IMMEDIATELY
- **Reaction upon N:** NONE
- **Acknowl. upon N:** NONE

### A32414 (F, N) Encoder 2: Amplitude error track C or D (C^2 + D^2)

- **Message value:** C track: %1, D track: %2
- **Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
- **Reaction:** NONE
- **Acknowledge:** NONE
- **Cause:** The amplitude (C^2 + D^2) of track C or D of the encoder or from the Hall signals, is not within the tolerance bandwidth.
  - Alarm value (r2124, interpret hexadecimal):
    - yyyyxxxx hex:
      - yyyy = Signal level, track D (16 bits with sign).
      - xxxx = Signal level, track C (16 bits with sign).
  - The nominal signal level of the encoder must lie in the range 375 mV to 600 mV (500 mV -25/+20 %).
  - The response thresholds are < 230 mV (observe the frequency response of the encoder) and > 750 mV.
  - A signal level of 500 mV peak value corresponds to the numerical value 5333 hex = 21299 dec.
  - Note: If the amplitude is not within the tolerance bandwidth, then it cannot be used to initialize the start position.
- **Remedy:**
  - check that the encoder cables are routed in compliance with EMC.
  - check the plug connections
  - replace the encoder or encoder cable
  - check the Sensor Module (e.g. contacts).
  - check the Hall sensor box
- **Reaction upon F:** NONE (IASC/DCBRAKE, OFF1, OFF2, OFF3, STOP1, STOP2)
- **Acknowl. upon F:** IMMEDIATELY
- **Reaction upon N:** NONE
- **Acknowl. upon N:** NONE

### N32415 (F, A) Encoder 2: Amplitude alarm track A or B (A^2 + B^2)

- **Message value:** Amplitude: %1, Angle: %2
- **Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
- **Reaction:** NONE
- **Acknowledge:** NONE
- **Cause:** The amplitude (root of A^2 + B^2) for encoder 2 exceeds the permissible tolerance.
  - Alarm value (r2124, interpret hexadecimal):
    - yyyyxxxx hex:
      - yyyy = Angle
      - xxxx = Amplitude, i.e. root from A^2 + B^2 (16 bits without sign)
  - The nominal signal level of the encoder must lie in the range 375 mV to 600 mV (500 mV -25/+20 %).
  - The response threshold is < 300 mV (observe the frequency response of the encoder).
  - A signal level of 500 mV peak value corresponds to the numerical value 299A hex = 10650 dec.
### Faults and alarms

#### List of faults and alarms

The angle 0 … FFFF hex corresponds to 0 … 360 degrees of the fine position. Zero degrees is at the negative zero crossover of track B.

Note: For sensors modules for resolvers (e.g. SMC10):
- The nominal signal level is at 2900 mV (2.0 Vrms). The response threshold is < 1414 mV (1.0 Vrms).
- A signal level of 2900 mV peak value corresponds to the numerical value 3333 hex = 13107 dec.

Note: The analog values of the amplitude error are not measured at the same time with the hardware fault output by the Sensor Module.

**Remedy:**
- check the speed range, frequency characteristic (amplitude characteristic) of the measuring equipment is not sufficient for the speed range.
- check that the encoder cables and shielding are routed in compliance with EMC.
- check the plug connections
- replace the encoder or encoder cable
- check the Sensor Module (e.g. contacts).
- if the coding disk is soiled or the lighting aged, replace the encoder.

**Reaction upon F:** NONE (IASC/DCBRAKE, OFF1, OFF2, OFF3, STOP1, STOP2)
**Acknowl. upon F:** IMMEDIATELY
**Reaction upon A:** NONE
**Acknowl. upon A:** NONE

<table>
<thead>
<tr>
<th>A32418 (F, N) Encoder 2: Speed difference per sampling rate exceeded</th>
</tr>
</thead>
</table>
| **Message value:** 1%
| **Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN |
| **Reaction:** NONE |
| **Acknowledge:** NONE |
| **Cause:** For a HTL/TTL encoder, the speed difference between two sampling cycles has exceeded the value in p0492. The change to the averaged speed actual value - if applicable - is monitored in the current controller sampling time. Alarm value (r2124, interpret decimal):
  Only for internal Siemens troubleshooting.
  See also: p0492 (Square-wave encoder, maximum speed difference per sampling cycle)

**Remedy:**
- check the tachometer feeder cable for interruptions.
- check the grounding of the tachometer shielding.
- if required, increase the setting of p0492.

**Reaction upon F:** NONE (IASC/DCBRAKE, OFF1, OFF2, OFF3, STOP1, STOP2)
**Acknowl. upon F:** IMMEDIATELY
**Reaction upon N:** NONE
**Acknowl. upon N:** NONE

<table>
<thead>
<tr>
<th>A32419 (F, N) Encoder 2: Track A or B outside tolerance</th>
</tr>
</thead>
</table>
| **Message value:** 1%
| **Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN |
| **Reaction:** NONE |
| **Acknowledge:** NONE |
| **Cause:** The amplitude/phase/offset correction for track A or B is at the limit.
  Amplitude error correction: Amplitude B / Amplitude A = 0.78 ... 1.27
  Phase: <84 degrees or >96 degrees
  SMC20: Offset correction: +/-140 mV
  SMC10: Offset correction: +/-650 mV
  Alarm value (r2124, interpret hexadecimal):
  xxxx1: Minimum of the offset correction, track B
  xxxx2: Maximum of the offset correction, track B
  xx1xx: Minimum of the offset correction, track A
  xx2xx: Maximum of the offset correction, track A
  x1xx: Minimum of the phase error correction
  x2xx: Maximum of the phase error correction
  1xxxx: Minimum of the cubic correction
  2xxxx: Maximum of the cubic correction

**Reaction upon F:** NONE (IASC/DCBRAKE, OFF1, OFF2, OFF3, STOP1, STOP2)
**Acknowl. upon F:** IMMEDIATELY
**Reaction upon N:** NONE
**Acknowl. upon N:** NONE
Remedy: 
- check mechanical mounting tolerances for encoders without their own bearings (e.g. toothed-wheel encoders).
- check the plug connections (also the transition resistance).
- check the encoder signals.
- replace the encoder or encoder cable

Reaction upon F: NONE (IASC/DCBRAKE, OFF1, OFF2, OFF3, STOP1, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

A32421 (F, N) Encoder 2: Coarse position error

**Message value:** %1

**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:**
For the actual value sensing, an error was detected. As a result of this error, it must be assumed that the actual value sensing supplies an incorrect coarse position.

Alarm value (r2124, interpret decimal):
3: The absolute position of the serial protocol and track A/B differ by half an encoder pulse. The absolute position must have its zero position in the quadrants in which both tracks are negative. In the case of a fault, the position can be incorrect by one encoder pulse.

**Remedy:**
- For a standard encoder with cable, contact the manufacturer where relevant.
- correct the assignment of the tracks to the position value that is serially transferred. To do this, the two tracks must be connected, inverted, at the Sensor Module (interchange A with A* and B with B*) or, for a programmable encoder, check the zero offset of the position.

Reaction upon F: NONE (IASC/DCBRAKE, OFF1, OFF2, OFF3, STOP1, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

A32422 (F, N) Encoder 2: Pulses per revolution square-wave encoder outside tolerance bandwidth

**Message value:** %1

**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:**
The measured zero mark distance does not correspond to the parameterized zero mark distance. This alarm is triggered with active square-wave encoder PPR correction and re-parameterized fault 31131 if the accumulator contains larger values than p4683 or p4684. The zero mark distance for zero mark monitoring is set in p0425 (rotary encoder).

Alarm value (r2124, interpret decimal): accumulated differential pulses in encoder pulses.

**Remedy:**
- check that the encoder cables are routed in compliance with EMC.
- check the plug connections
- check the encoder type (encoder with equidistant zero marks).
- adapt the parameter for the distance between zero marks (p0424, p0425).
- replace the encoder or encoder cable

Reaction upon F: NONE (IASC/DCBRAKE, OFF1, OFF2, OFF3, STOP1, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE
### A32429 (F, N)  
**Encoder 2: Position difference, hall sensor/track C/D and A/B too large**

<table>
<thead>
<tr>
<th>Message value</th>
<th>%1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive object</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
</tr>
<tr>
<td>Reaction</td>
<td>NONE</td>
</tr>
<tr>
<td>Acknowledge</td>
<td>NONE</td>
</tr>
</tbody>
</table>
| Cause         | The error for track C/D is greater than +/-15 ° mechanical or +/-60 ° electrical or the error for the Hall signals is greater than +/-60 ° electrical.  
One period of track C/D corresponds to 360 ° mechanical.  
One period of the Hall signal corresponds to 360 ° electrical.  
The monitoring responds if, for example, Hall sensors are connected as equivalent for the C/D tracks with the incorrect rotational sense or supply values that are not accurate enough.  
Alarm value (r2124, interpret decimal):  
For track C/D, the following applies:  
Measured deviation as mechanical angle (16 bits with sign, 182 dec corresponds to 1 °).  
For Hall signals, the following applies:  
Measured deviation as electrical angle (16 bits with sign, 182 dec corresponds to 1 °). |
| Remedy        | - track C or D not connected.  
- correct the direction of rotation of the Hall sensor possibly connected as equivalent for track C/D.  
- check that the encoder cables are routed in compliance with EMC.  
- check the adjustment of the Hall sensor. |
| Reaction upon F | NONE (IASC/DCBRAKE, OFF1, OFF2, OFF3, STOP1, STOP2) |
| Acknow. upon F | IMMEDIATELY |
| Reaction upon N | NONE |
| Acknow. upon N | NONE |

### A32431 (F, N)  
**Encoder 2: Deviation, position incremental/absolute too large**

<table>
<thead>
<tr>
<th>Message value</th>
<th>%1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive object</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
</tr>
<tr>
<td>Reaction</td>
<td>NONE</td>
</tr>
<tr>
<td>Acknowledge</td>
<td>NONE</td>
</tr>
</tbody>
</table>
| Cause         | When the zero pulse is passed, a deviation in the incremental position was detected.  
For equidistant zero marks, the following applies:  
- The first zero mark passed supplies the reference point for all subsequent checks. The other zero marks must have n times the distance referred to the first zero mark.  
For distance-coded zero marks, the following applies:  
- the first zero mark pair supplies the reference point for all subsequent checks. The other zero mark pairs must have the expected distance to the first zero mark pair.  
Alarm value (r2124, interpret decimal):  
Deviation in quadrants (1 pulse = 4 quadrants). |
| Remedy        | - check that the encoder cables are routed in compliance with EMC.  
- check the plug connections  
- replace the encoder or encoder cable  
- Clean coding disk or remove strong magnetic fields. |
| Reaction upon F | NONE (IASC/DCBRAKE, OFF1, OFF2, OFF3, STOP1, STOP2) |
| Acknow. upon F | IMMEDIATELY |
| Reaction upon N | NONE |
| Acknow. upon N | NONE |

### A32432 (F, N)  
**Encoder 2: Rotor position adaptation corrects deviation**

<table>
<thead>
<tr>
<th>Message value</th>
<th>%1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive object</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
</tr>
<tr>
<td>Reaction</td>
<td>NONE</td>
</tr>
<tr>
<td>Acknowledge</td>
<td>NONE</td>
</tr>
</tbody>
</table>
| Cause         | For track A/B, pulses have been lost or too many have been counted. These pulses are presently being corrected.  
Alarm value (r2124, interpret decimal):  
Last measured deviation of zero mark in increments (4 increments = 1 encoder pulse).  
The sign designates the direction of motion when detecting the zero mark distance. |
Remedy:  
- check that the encoder cables are routed in compliance with EMC.  
- check the plug connections  
- replace the encoder or encoder cable  
- check encoder limit frequency.  
- adapt the parameter for the distance between zero marks (p0424, p0425).  

Reaction upon F:  NONE (ENCODER, IASC/DCBRAKE, OFF1, OFF2, OFF3, STOP1, STOP2)  
Acknowl. upon F:  IMMEDIATELY  
Reaction upon N:  NONE  
Acknowl. upon N:  NONE  

A32442 (F, N) Encoder 2: Battery voltage pre-alarm  
Message value:  -  
Drive object:  SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
Reaction:  NONE  
Acknowledge:  NONE  
Cause:  When switched-off, the encoder uses a battery to back up the multiturn information. The battery voltage is no longer sufficient to check the multiturn information.  
Remedy:  Replace battery.  
Reaction upon F:  NONE (ENCODER, IASC/DCBRAKE, OFF1, OFF2, OFF3, STOP1, STOP2)  
Acknowl. upon F:  IMMEDIATELY  
Reaction upon N:  NONE  
Acknowl. upon N:  NONE  

A32443 (F, N) Encoder 2: Unipolar CD signal level outside specification  
Message value:  Fault cause: %1 bin  
Drive object:  SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
Reaction:  NONE  
Acknowledge:  NONE  
Cause:  The unipolar level (CP/CN or DP/DN) for encoder 2 is outside the permissible tolerance.  
Alarm value (r2124, binary interpretation):  
Bit 0 = 1: Either CP or CN outside the tolerance.  
Bit 16 = 1: Either DP or DN outside the tolerance.  
The unipolar nominal signal level of the encoder must lie in the range 2500 mV +/- 500 mV.  
The response thresholds are < 1700 mV and > 3300 mV.  
Note:  The signal level is not evaluated unless the following conditions are satisfied:  
- Sensor Module properties available (r0459.31 = 1).  
- Monitoring active (p0437.31 = 1).  
Remedy:  
- check that the encoder cables and shielding are routed in compliance with EMC.  
- check the plug connections and contacts of the encoder cable.  
- are the C/D tracks connected correctly (have the signal lines CP and CN or DP and DN been interchanged)?  
- replace the encoder cable.  
Reaction upon F:  NONE (IASC/DCBRAKE, OFF1, OFF2, OFF3, STOP1, STOP2)  
Acknowl. upon F:  IMMEDIATELY  
Reaction upon N:  NONE  
Acknowl. upon N:  NONE  

A32460 (N) Encoder 2: Analog sensor channel A failed  
Message value:  %1  
Drive object:  SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN  
Reaction:  NONE  
Acknowledge:  NONE  
Cause:  The input voltage of the analog sensor is outside the permissible limits.  
Alarm value (r2124, interpret decimal):  
1: Input voltage outside detectable measuring range.  
2: Input voltage outside measuring range set in p4673.  
3: The absolute value of the input voltage has exceeded the range limit (p4676).
Faults and alarms

List of faults and alarms

Remedy:
Re alarm value = 1:
- check the output voltage of the analog sensor.
Re alarm value = 2:
- check the voltage setting for each encoder period (p4673).
Re alarm value = 3:
- check the range limit setting and increase it if necessary (p4676).

Reaction upon N: NONE
Acknowl. upon N: NONE

A32461 (N) Encoder 2: Analog sensor channel B failed
Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: The input voltage of the analog sensor is outside the permissible limits.
Alarm value (r2124, interpret decimal):
1: Input voltage outside detectable measuring range.
2: Input voltage outside the measuring range set in (p4675).
3: The absolute value of the input voltage has exceeded the range limit (p4676).

Remedy:
Re alarm value = 1:
- check the output voltage of the analog sensor.
Re alarm value = 2:
- check the voltage setting for each encoder period (p4675).
Re alarm value = 3:
- check the range limit setting and increase it if necessary (p4676).

Reaction upon N: NONE
Acknowl. upon N: NONE

A32462 (N) Encoder 2: Analog sensor, no channel active
Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: Channel A and B are not activated for the analog sensor.

Remedy:
- activate channel A and/or channel B (p4670).
- check the encoder configuration (p0404.17).
See also: p4670 (Analog sensor configuration)

Reaction upon N: NONE
Acknowl. upon N: NONE

A32463 (N) Encoder 2: Analog sensor position value exceeds limit value
Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: The position value has exceeded the permissible range of -0.5 ... 0.5.
Alarm value (r2124, interpret decimal):
1: Position value from the LVDT sensor.
2: Position value from the encoder characteristic.

Remedy:
Re alarm value = 1:
- Check the LVDT ratio (p4678).
- check the reference signal connection at track B.
Re alarm value = 2:
- check the coefficients of the characteristic (p4663 ... p4666).

Reaction upon N: NONE
Acknowl. upon N: NONE
### A32470 (F, N) Encoder 2: Soiling detected

**Message value:** -

**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:** In the case of the alternative encoder system interface on the Sensor Module Cabinet 30 (SMC30), encoder soiling is signaled via a 0 signal at terminal X521.7.

**Remedy:**
- check the plug connections
- replace the encoder or encoder cable

**Reaction upon F:** NONE (IASC/DCBRAKE, OFF1, OFF2, OFF3, STOP1, STOP2)

**Acknowl. upon F:** IMMEDIATELY

**Reaction upon N:** NONE

**Acknowl. upon N:** NONE

---

### F32500 (N, A) Encoder 2: Position tracking traversing range exceeded

**Message value:** -

**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

**Reaction:** OFF1 (NONE, OFF2, OFF3)

**Acknowledge:** IMMEDIATELY

**Cause:** For a configured linear axis without modulo correction, the drive/encoder has exceeded the maximum possible traversing range. The value should be read in p0412 and interpreted as the number of motor revolutions.

For p0411.0 = 1, the maximum traversing range for the configured linear axis is defined to be 64x (+/- 32x) of p0421.

For p0411.3 = 1, the maximum traversing range for the configured linear axis is pre-set (default value) to the highest possible value and is +/-p0412/2 (rounded off to complete revolutions). The highest possible value depends on the pulse number (p0408) and the fine resolution (p0419).

**Remedy:**
- The fault should be resolved as follows:
  - select encoder commissioning (p0010 = 4).
  - reset the position tracking as follows (p0411.2 = 1).
  - de-select encoder commissioning (p0010 = 0).

The fault should then be acknowledged and the absolute encoder adjusted.

**Reaction upon N:** NONE

**Acknowl. upon N:** NONE

**Reaction upon A:** NONE

**Acknowl. upon A:** NONE

---

### F32501 (N, A) Encoder 2: Position tracking encoder position outside tolerance window

**Message value:** %1

**Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN

**Reaction:** OFF1 (NONE, OFF2, OFF3)

**Acknowledge:** IMMEDIATELY

**Cause:** When powered down, the drive/encoder was moved through a distance greater than was parameterized in the tolerance window. It is possible that there is no longer any reference between the mechanical system and encoder.

Fault value (r0949, decimal interpretation):
Deviation (difference) to the last encoder position in increments of the absolute value.

The sign designates the traversing direction.

Note:
- The deviation (difference) found is also displayed in r0477.

**Remedy:**
- Reset the position tracking as follows:
  - select encoder commissioning (p0010 = 4).
  - reset the position tracking as follows (p0411.2 = 1).
  - de-select encoder commissioning (p0010 = 0).

The fault should then be acknowledged and, if necessary, the absolute encoder adjusted (p2507).

See also: p0010 (Drive commissioning parameter filter), p2507 (LR absolute encoder adjustment status)

**Reaction upon N:** NONE

**Acknowl. upon N:** NONE

**Reaction upon A:** NONE

**Acknowl. upon A:** NONE
### Faults and alarms

#### List of faults and alarms

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Message value</th>
<th>Drive object</th>
<th>Reaction</th>
<th>Acknowledge</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>A32700</td>
<td>Encoder 2: Effectivity test does not supply the expected value</td>
<td>Fault cause: %1 bin <em>Drive object</em>: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>NONE</td>
<td>NONE</td>
<td>NONE</td>
<td>The DRIVE-CLiQ encoder fault word supplies fault bits that have been set. Fault value (r0949, interpret binary): Bit x = 1: Effectivity test x unsuccessful.</td>
<td>Replace encoder.</td>
</tr>
<tr>
<td>N32800 (F)</td>
<td>Encoder 2: Group signal</td>
<td></td>
<td></td>
<td></td>
<td>NONE</td>
<td>The motor encoder has detected at least one fault.</td>
<td>Evaluates other actual messages.</td>
</tr>
</tbody>
</table>
| F32801 (N, A) | Encoder 2 DRIVE-CLiQ: Sign-of-life missing                                  | Component number: %1, fault cause: %2 *Drive object*: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN | OFF1 (IASC/DCBRAKE, NONE, OFF2, OFF3)                                       |          | IMMEDIATELY | A DRIVE-CLiQ communication error has occurred from the Control Unit to the encoder involved. Fault value (r0949, interpret hexadecimal): yyxx hex: yy = component number, xx = fault cause xx = 0A hex: The sign-of-life bit in the receive telegram is not set. | - check the electrical cabinet design and cable routing for EMC compliance  
- replace the component involved.  
See also: p9916 (DRIVE-CLiQ data transfer error shutdown threshold slave) |
| F32802 (N, A) | Encoder 2: Time slice overflow                                           | %1                                                                           |                                                                              |          | IMMEDIATELY | A time slice overflow has occurred in encoder 2.                  | Reduce the current controller frequency.                              |

---

**Fault value (r0949, interpret hexadecimal):**

yyxx hex: yy = component number, xx = fault cause

- 9: Time slice overflow of the fast (current controller clock cycle) time slice.
- 10: Time slice overflow of the average time slice.
- 12: Time slice overflow of the slow time slice.
- 999: Timeout when waiting for SYNO (e.g. unexpected return to non-cyclic operation).
### List of faults and alarms

#### Faults and alarms

**F32804 (N, A) Encoder 2: Checksum error**

- **Message value:** %1
- **Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
- **Reaction:** OFF1 (IASC/DCBRAKE, NONE, OFF2, OFF3)
- **Acknowledge:** IMMEDIATELY
- **Cause:** A checksum error has occurred when reading-out the program memory on the Sensor Module.
  
  Fault value (r0949, interpret hexadecimal):
  
  yyyyxxxx hex
  
  yyyy: Memory area involved.
  
  xxxx: Difference between the checksum at POWER ON and the actual checksum.
- **Remedy:**
  - check whether the permissible ambient temperature for the component is maintained.
  - replace the Sensor Module.

  **Reaction upon N:** NONE
  **Acknowledgment upon N:** NONE
  **Reaction upon A:** NONE
  **Acknowledgment upon A:** NONE

#### F32805 (N, A) Encoder 2: EPROM checksum error

- **Message value:** %1
- **Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
- **Reaction:** OFF1 (IASC/DCBRAKE, NONE, OFF2, OFF3)
- **Acknowledge:** IMMEDIATELY
- **Cause:** Internal parameter data is corrupted.
- **Fault value (r0949, interpret hexadecimal):**
  
  01: EEPROM access error.
  
  02: Too many blocks in the EEPROM.
- **Remedy:** Replace the module.

  **Reaction upon N:** NONE
  **Acknowledgment upon N:** NONE
  **Reaction upon A:** NONE
  **Acknowledgment upon A:** NONE

#### F32806 (N, A) Encoder 2: Initialization error

- **Message value:** %1
- **Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
- **Reaction:** OFF1 (IASC/DCBRAKE, NONE, OFF2, OFF3)
- **Acknowledge:** PULSE INHIBIT
- **Cause:** The encoder was not successfully initialized.
- **Fault value (r0949, interpret hexadecimal):**
  
  Bit 0, 1: Encoder initialization with the motor rotating has failed (deviation involving coarse and fine position in encoder pulses/4).
  
  Bit 2: Mid-voltage matching for track A unsuccessful.
  
  Bit 3: Mid-voltage matching for track B unsuccessful.
  
  Bit 4: Mid-voltage matching for acceleration input unsuccessful.
  
  Bit 5: Mid-voltage matching for track safety A unsuccessful.
  
  Bit 6: Mid-voltage matching for track safety B unsuccessful.
  
  Bit 7: Mid-voltage matching for track C unsuccessful.
  
  Bit 8: Mid-voltage matching for track D unsuccessful.
  
  Bit 9: Mid-voltage matching for track R unsuccessful.
  
  Bit 10: The difference in mid-voltages between A and B is too great (> 0.5 V)
  
  Bit 11: The difference in mid-voltages between C and D is too great (> 0.5 V)
  
  Bit 12: The difference in mid-voltages between safety A and safety B is too great (> 0.5 V)
  
  Bit 13: The difference in mid-voltages between A and safety B is too great (> 0.5 V)
  
  Bit 14: The difference in mid-voltages between B and safety A is too great (> 0.5 V)
  
  Bit 15: The standard deviation of the calculated mid-voltages is too great (> 0.3 V)
  
  Bit 16: Internal fault - fault reading a register (CAFE)
  
  Bit 17: Internal fault - fault writing a register (CAFE)
  
  Bit 18: Internal fault: No mid-voltage matching available
Faults and alarms
List of faults and alarms

Bit 19: Internal error - ADC access error.
Bit 20: Internal error - no zero crossover found.

Note:
Bit 0, 1: Up to 6SL3055-0AA00-5*A0
Bits 2 ... 20: 6SL3055-0AA00-5*A1 and higher

Remedy:
Acknowledge the fault.
If the fault cannot be acknowledged:
Bits 2 ... 9: Check encoder power supply.
Bits 2 ... 14: Check the corresponding cable.
Bit 15 with no other bits: Check track R, check settings in p0404.

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F32811 (N, A) Encoder 2: Encoder serial number changed
Message value:
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF1 (NONE, OFF2, OFF3)
Acknowledge: IMMEDIATELY
Cause: The encoder serial number has changed. The change is only checked for encoders with serial number (e.g. EnDat encoders).
- The encoder was replaced.
Note: With closed-loop position control, the serial number is accepted when starting the adjustment (p2507 = 2).
When the encoder is adjusted (p2507 = 3), the serial number is checked for changes and if required, the adjustment is reset (p2507 = 1).
Proceed as follows to hide serial number monitoring:
- set the following serial numbers for the corresponding Encoder Data Set: p0441= FF, p0442 = 0, p0442 = 0, p0444 = 0, p0445 = 0.
Remedy: Mechanically adjust the encoder. Accept the new serial number with p0440 = 1.

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F32812 (N, A) Encoder 2: Requested cycle or RX-/TX timing not supported
Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF2
Acknowledge: IMMEDIATELY
Cause: A cycle requested from the Control Unit or RX/TX timing is not supported.
Fault value (r0949, decimal interpretation):
0: Application cycle is not supported.
1: DRIVE-CLiQ cycle is not supported.
2: Distance between RX and TX instants in time too low.
3: TX instant in time too early.
Remedy: POWER ON all components (switch the power off and then back on again).

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE
F32813 Encoder 2: Hardware logic unit failed
Message value: Fault cause: %1 bin
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF1 (IASC/DCCBRAKE, NONE, OFF2, OFF3)
Acknowledge: PULSE INHIBIT
Cause: The DRIVE-CLiQ encoder fault word supplies fault bits that have been set.
Fault value (r0949, interpret binary):
Bit 0: ALU watchdog has responded.
Bit 1: ALU has detected a sign-of-life error.
Remedy: Replace encoder.

F32820 (N, A) Encoder 2 DRIVE-CLiQ: Telegram error
Message value: Component number: %1, fault cause: %2
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF1 (IASC/DCCBRAKE, NONE, OFF2, OFF3)
Acknowledge: IMMEDIATELY
Cause: A DRIVE-CLiQ communication error has occurred from the Control Unit to the encoder concerned.
Fault value (r0949, interpret hexadecimal):
yyxx hex: yy = component number, xx = fault cause
xx = 01 hex: CRC error.
xx = 02 hex: Telegram is shorter than specified in the length byte or in the receive list.
xx = 03 hex: Telegram is longer than specified in the length byte or in the receive list.
xx = 04 hex: The length of the receive telegram does not match the receive list.
xx = 05 hex: The type of the receive telegram does not match the receive list.
xx = 06 hex: The address of the component in the telegram and in the receive list do not match.
xx = 07 hex: A SYNC telegram is expected - but the received telegram is not a SYNC telegram.
xx = 08 hex: No SYNC telegram is expected - but the received telegram is one.
xx = 09 hex: The error bit in the receive telegram is set.
xx = 10 hex: The receive telegram is too early.
Remedy: - carry out a POWER ON.
- check the electrical cabinet design and cable routing for EMC compliance
- check the DRIVE-CLiQ wiring (interrupted cable, contacts, ...).
See also: p9916 (DRIVE-CLiQ data transfer error shutdown threshold slave)

F32835 (N, A) Encoder 2 DRIVE-CLiQ: Cyclic data transfer error
Message value: Component number: %1, fault cause: %2
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF1 (IASC/DCCBRAKE, NONE, OFF2, OFF3)
Acknowledge: IMMEDIATELY
Cause: A DRIVE-CLiQ communication error has occurred from the Control Unit to the encoder concerned. The nodes do not send and receive in synchronisation.
Faults and alarms

List of faults and alarms

Fault value (r0949, interpret hexadecimal):

- yyxx hex: yy = component number, xx = fault cause
- xx = 21 hex: The cyclic telegram has not been received.
- xx = 22 hex: Timeout in the telegram receive list.
- xx = 40 hex: Timeout in the telegram send list.

Remedy:
- carry out a POWER ON.
- replace the component involved.

See also: p9916 (DRIVE-CLiQ data transfer error shutdown threshold slave)

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F32836 (N, A) Encoder 2 DRIVE-CLiQ: Send error for DRIVE-CLiQ data

Message value: Component number: %1, fault cause: %2
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF1 (IASC/DCBRAKE, NONE, OFF2, OFF3)
Acknowledge: IMMEDIATELY
Cause: A DRIVE-CLiQ communication error has occurred from the Control Unit to the encoder involved. Data were not able to be sent.

Fault value (r0949, interpret hexadecimal):

- yyxx hex: yy = component number, xx = fault cause
- xx = 41 hex: Telegram type does not match send list.

Remedy: Carry out a POWER ON.

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F32837 (N, A) Encoder 2 DRIVE-CLiQ: Component fault

Message value: Component number: %1, fault cause: %2
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF1 (IASC/DCBRAKE, NONE, OFF2, OFF3)
Acknowledge: IMMEDIATELY
Cause: Fault detected on the DRIVE-CLiQ component concerned. Faulty hardware cannot be excluded.

Fault value (r0949, interpret hexadecimal):

- yyxx hex: yy = component number, xx = fault cause
- xx = 20 hex: Error in the telegram header.
- xx = 42 hex: Send error: The telegram buffer memory contains an error.
- xx = 43 hex: Send error: The telegram buffer memory contains an error.

Remedy:
- check the DRIVE-CLiQ wiring (interrupted cable, contacts, ...).
- check the electrical cabinet design and cable routing for EMC compliance
- if required, use another DRIVE-CLiQ socket (p9904).
- replace the component involved.

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE
<table>
<thead>
<tr>
<th>Fault Code</th>
<th>Description</th>
<th>Message Value</th>
<th>Drive Object</th>
<th>Reaction</th>
<th>Acknowledge</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>F32845 (N, A)</td>
<td>Encoder 2 DRIVE-CLiQ: Cyclic data transfer error</td>
<td>Component number: %1, fault cause: %2</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>OFF1 (IASC/DCBRAKE, NONE, OFF2, OFF3)</td>
<td>IMMEDIATELY</td>
<td>A DRIVE-CLiQ communication error has occurred from the Control Unit to the encoder involved.</td>
<td>Carry out a POWER ON.</td>
</tr>
<tr>
<td>F32850 (N, A)</td>
<td>Encoder 2: Encoder evaluation, internal software error</td>
<td>%1</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>OFF1 (IASC/DCBRAKE, NONE, OFF2, OFF3)</td>
<td>POWER ON</td>
<td>An internal software error has occurred in the Sensor Module of encoder 2.</td>
<td>- replace the Sensor Module.</td>
</tr>
<tr>
<td>F32851 (N, A)</td>
<td>Encoder 2 DRIVE-CLiQ (CU): Sign-of-life missing</td>
<td>Component number: %1, fault cause: %2</td>
<td>SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN</td>
<td>OFF1 (IASC/DCBRAKE, NONE, OFF2, OFF3)</td>
<td>IMMEDIATELY</td>
<td>A DRIVE-CLiQ communication error has occurred from the Sensor Module (encoder 2) involved to the Control Unit. The DRIVE-CLiQ component did not set the sign-of-life to the Control Unit.</td>
<td>Upgrade the firmware of the component involved.</td>
</tr>
</tbody>
</table>
Faults and alarms

List of faults and alarms

Reaction upon A: NONE
Acknowl. upon A: NONE

F32860 (N, A) Encoder 2 DRIVE-CLiQ (CU): Telegram error
Message value: Component number: %1, fault cause: %2
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF1 (IASC/DCBRAKE, NONE, OFF2, OFF3)
Acknowledge: IMMEDIATELY
Cause: A DRIVE-CLiQ communication error has occurred from the Sensor Module (encoder 2) involved to the Control Unit.
Fault value (r0949, interpret hexadecimal):
xx = yy hex: yy = component number, xx = fault cause
xx = 11 hex = 17 dec: CRC error and the receive telegram is too early.
xx = 01 hex = 01 dec: Checksum error (CRC error).
xx = 12 hex = 18 dec: The telegram is shorter than that specified in the length byte or in the receive list and the receive telegram is too early.
xx = 02 hex = 02 dec: The telegram is shorter than specified in the length byte or in the receive list.
xx = 13 hex = 19 dec: The telegram is longer than that specified in the length byte or in the receive list and the receive telegram is too early.
xx = 03 hex = 03 dec: The telegram is longer than specified in the length byte or in the receive list.
xx = 14 hex = 20 dec: The length of the receive telegram does not match the receive list and the receive telegram is too early.
xx = 04 hex = 04 dec: The length of the receive telegram does not match the receive list.
xx = 15 hex = 21 dec: The type of the receive telegram does not match the receive list and the receive telegram is too early.
xx = 05 hex = 05 dec: The type of the receive telegram does not match the receive list.
xx = 16 hex = 22 dec: The address of the power unit in the telegram and in the receive list does not match and the receive telegram is too early.
xx = 06 hex = 06 dec: The address of the power unit in the telegram and in the receive list do not match.
xx = 19 hex = 25 dec: The error bit in the receive telegram is set and the receive telegram is too early.
xx = 09 hex = 09 dec: The error bit in the receive telegram is set.
xx = 10 hex = 16 dec: The receive telegram is too early.
Remedy: - carry out a POWER ON.
- check the electrical cabinet design and cable routing for EMC compliance
- check the DRIVE-CLiQ wiring (interrupted cable, contacts, ...).
See also: p9915 (DRIVE-CLiQ data transfer error shutdown threshold master)

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F32885 (N, A) Encoder 2 DRIVE-CLiQ (CU): Cyclic data transfer error
Message value: Component number: %1, fault cause: %2
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF1 (IASC/DCBRAKE, NONE, OFF2, OFF3)
Acknowledge: IMMEDIATELY
Cause: A DRIVE-CLiQ communication error has occurred from the Sensor Module (encoder 2) involved to the Control Unit.
The nodes do not send and receive in synchronism.
Faults and alarms

List of faults and alarms

Fault value (r0949, interpret hexadecimal):
yyxx hex: yy = component number, xx = fault cause
xx = 1A hex = 26 dec:
Sign-of-life bit in the receive telegram not set and the receive telegram is too early.
xx = 21 hex = 33 dec:
The cyclic telegram has not been received.
xx = 22 hex = 34 dec:
Timeout in the telegram receive list.
xx = 40 hex = 64 dec:
Timeout in the telegram send list.
xx = 62 hex = 98 dec:
Error at the transition to cyclic operation.

Remedy:
- check the power supply voltage of the component involved.
- carry out a POWER ON.
- replace the component involved.
See also: p9915 (DRIVE-CLiQ data transfer error shutdown threshold master)

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F32886 (N, A) Encoder 2 DRIVE-CLiQ (CU): Error when sending DRIVE-CLiQ data
Message value:
Component number: %1, fault cause: %2
Drive object:
SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction:
OFF1 (IASC/DCBRAKE, NONE, OFF2, OFF3)
Acknowledge:
IMMEDIATELY
Cause:
A DRIVE-CLiQ communication error has occurred from the Sensor Module (encoder 2) involved to the Control Unit. Data were not able to be sent.
Fault value (r0949, interpret hexadecimal):
yyxx hex: yy = component number, xx = fault cause
xx = 41 hex:
Telegram type does not match send list.

Remedy:
Carry out a POWER ON.

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F32887 (N, A) Encoder 2 DRIVE-CLiQ (CU): Component fault
Message value:
Component number: %1, fault cause: %2
Drive object:
SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction:
OFF1 (IASC/DCBRAKE, NONE, OFF2, OFF3)
Acknowledge:
IMMEDIATELY
Cause:
Fault detected on the DRIVE-CLiQ component involved (Sensor Module for encoder 2). Faulty hardware cannot be excluded.
Fault value (r0949, interpret hexadecimal):
yyxx hex: yy = component number, xx = fault cause
xx = 20 hex:
Error in the telegram header.
xx = 23 hex:
Receive error: The telegram buffer memory contains an error.
xx = 42 hex:
Send error: The telegram buffer memory contains an error.
xx = 43 hex:
Send error: The telegram buffer memory contains an error.
xx = 60 hex:
Response received too late during runtime measurement.
xx = 61 hex:
Time taken to exchange characteristic data too long.
Faults and alarms

List of faults and alarms

Remedy:  
- check the DRIVE-CLiQ wiring (interrupted cable, contacts, ...).
- check the electrical cabinet design and cable routing for EMC compliance
- if required, use another DRIVE-CLiQ socket (p9904).
- replace the component involved.

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F32895 (N, A)  Encoder 2 DRIVE-CLiQ (CU): Alternating cyclic data transfer error
Message value:  Component number: %1, fault cause: %2
Drive object:  SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction:  OFF1 (IASC/DCBRAKE, NONE, OFF2, OFF3)
Acknowledge:  IMMEDIATELY
Cause:  A DRIVE-CLiQ communication error has occurred from the Sensor Module (encoder 2) involved to the Control Unit. Fault value (r0949, interpret hexadecimal): yyxx hex: yy = component number, xx = fault cause xx = 0B hex: Synchronization error during alternating cyclic data transfer.
Remedy:  Carry out a POWER ON.
See also: p9915 (DRIVE-CLiQ data transfer error shutdown threshold master)

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F32896 (N, A)  Encoder 2 DRIVE-CLiQ (CU): Inconsistent component properties
Message value:  Component number: %1
Drive object:  SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction:  OFF2 (IASC/DCBRAKE, NONE, OFF1, OFF3, STOP1, STOP2)
Acknowledge:  IMMEDIATELY
Cause:  The properties of the DRIVE-CLiQ component (Sensor Module for encoder 2), specified by the fault value, have changed in an incompatible fashion with respect to the properties when booted. One cause can be, e.g. that a DRIVE-CLiQ cable or DRIVE-CLiQ component has been replaced. Fault value (r0949, decimal interpretation): Component number.
Remedy:  - carry out a POWER ON.
- when a component is replaced, the same component type and if possible the same firmware version should be used.
- when a cable is replaced, only cables whose length is the same as or as close as possible to the length of the original cables should be used (ensure compliance with the maximum cable length).

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

F32899 (N, A)  Encoder 2: Unknown fault
Message value:  New message: %1
Drive object:  SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction:  OFF1 (IASC/DCBRAKE, NONE, OFF2, OFF3, STOP1, STOP2)
Acknowledge:  IMMEDIATELY (POWER ON)
Cause:  A fault occurred on the Sensor Module for encoder 2 that cannot be interpreted by the Control Unit firmware. This can occur if the firmware on this component is more recent than the firmware on the Control Unit. Fault value (r0949, decimal interpretation): Fault number.
Note:  If required, the significance of this new fault can be read about in a more recent description of the Control Unit.
**Remedy:**
- replace the firmware on the Sensor Module by an older firmware version (r0148).
- upgrade the firmware on the Control Unit (r0018).

**A32902 (F, N) Encoder 2: SPI-BUS error occurred**

- **Message value:** %1
- **Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
- **Reaction:** NONE
- **Acknowledge:** NONE
- **Cause:** Error when operating the internal SPI bus.
  Fault value (r0949, interpret hexadecimal):
  Only for internal Siemens troubleshooting.
- **Remedy:**
  - replace the Sensor Module.
  - if required, upgrade the firmware in the Sensor Module.
  - contact the Hotline.
- **Reaction upon F:** NONE (ENCODER, IASC/DCBRAKE, OFF1, OFF2, OFF3, STOP1, STOP2)
- **Acknowl. upon F:** IMMEDIATELY
- **Reaction upon N:** NONE
- **Acknowl. upon N:** NONE

**A32903 (F, N) Encoder 2: I2C-BUS error occurred**

- **Message value:** %1
- **Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
- **Reaction:** NONE
- **Acknowledge:** NONE
- **Cause:** Error when operating the internal I2C bus.
  Fault value (r0949, interpret hexadecimal):
  Only for internal Siemens troubleshooting.
- **Remedy:**
  - replace the Sensor Module.
  - if required, upgrade the firmware in the Sensor Module.
  - contact the Hotline.
- **Reaction upon F:** NONE (ENCODER, IASC/DCBRAKE, OFF1, OFF2, OFF3, STOP1, STOP2)
- **Acknowl. upon F:** IMMEDIATELY
- **Reaction upon N:** NONE
- **Acknowl. upon N:** NONE

**F32905 (N, A) Encoder 2: Parameterization error**

- **Message value:** Parameter: %1, supplementary information: %2
- **Drive object:** SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
- **Reaction:** OFF1 (IASC/DCBRAKE, NONE, OFF2, OFF3, STOP1, STOP2)
- **Acknowledge:** IMMEDIATELY
- **Cause:** A parameter of encoder 2 was detected as being incorrect.
  It is possible that the parameterized encoder type does not match the connected encoder.
  The parameter involved can be determined as follows:
  - determine the parameter number using the fault value (r0949).
  - determine the parameter index (p0187).
  Fault value (r0949, decimal interpretation):
  yyyyxxxx dec: yyyy = supplementary information, xxxx = parameter
  yyyy = 0:
  No information available.
  yyyy = 1:
  The component does not support HTL level (p0405.1 = 0) combined with track monitoring A/B <> -A/B (p0405.2 = 1).
Faults and alarms

List of faults and alarms

 yyyy = 2:
 A code number for an identified encoder has been entered into p0400, however, no identification was carried out. Please start a new encoder identification.

 yyyy = 3:
 A code number for an identified encoder has been entered into p0400, however, no identification was carried out. Please select a listed encoder in p0400 with a code number < 10000.

 yyyy = 4:
 This component does not support SSI encoders (p0404.9 = 1) without track A/B.

 yyyy = 5:
 For SQW encoder, value in p4686 greater than in p0425.

 yyyy = 6:
 DRIVE-CLIQ encoder cannot be used with this firmware version.

 yyyy = 7:
 For the SQW encoder, the Xact1 correction (p0437.2) is only permitted with equidistant zero marks.

 yyyy = 8:
 The motor pole pair width is not supported by the linear scale being used.

 Remedy:
 - check whether the connected encoder type matches the encoder that has been parameterized.
 - correct the parameter specified by the fault value (r0949) and p0187.
 - re parameter number = 314:
   - check the pole pair number and measuring gear ratio. The quotient of the "pole pair number" divided by the "measuring gear ratio" must be less than or equal to 1000 ((r0313 * p0433) / p0432 <= 1000).

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

A32915 (F, N) Encoder 2: Configuration error

Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause: The configuration for encoder 2 is incorrect.
Alarm value (r2124, interpret decimal):
1: Re-parameterization between fault/alarm is not permissible.
419: When the fine resolution Gx_XIST2 is configured, the encoder identifies a maximum possible absolute position actual value (r0483) that can no longer be represented within 32 bits.

Remedy:
Re alarm value = 1:
No re-parameterization between fault/alarm.
Re alarm value = 419:
Reduce the fine resolution (p0419).

Reaction upon F: NONE (IASC/DCBRAKE)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

F32916 (N, A) Encoder 2: Parameterization fault

Message value: Parameter: %1, supplementary information: %2
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: OFF1 (IASC/DCBRAKE, NONE, OFF2, OFF3, STOP1, STOP2)
Acknowledge: IMMEDIATELY
Cause: A parameter of encoder 2 was detected as being incorrect.
It is possible that the parameterized encoder type does not match the connected encoder.
The parameter involved can be determined as follows:
- determine the parameter number using the fault value (r0949).
- determine the parameter index (p0187).
Fault value (r0949, decimal interpretation):
Parameter number.
Note:
This fault is only output for encoders where r0404.10 = 1 or r0404.11 = 1. It corresponds to A32905 with encoders where r0404.10 = 0 and r0404.11 = 0.

Remedy:
- check whether the connected encoder type matches the encoder that has been parameterized.
- correct the parameter specified by the fault value (r0949) and p0187.

Reaction upon N: NONE
Acknowl. upon N: NONE
Reaction upon A: NONE
Acknowl. upon A: NONE

A32920 (F, N) Encoder 2: Temperature sensor fault
Message value:
Fault cause: %1, channel number: %2
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause:
When evaluating the temperature sensor, an error occurred.
Alarm value (r2124, interpret decimal):
yyxx hex: yy: channel number, xx = fault cause
xx = 1: Wire breakage or sensor not connected (KTY: R > 1630 Ohm).
xx = 2: Measured resistance too low (PTC: R < 20 Ohm, KTY: R < 50 Ohm).
xx = Additional values:
Only for internal Siemens troubleshooting.
Remedy:
- check that the encoder cable is the correct type and is correctly connected.
- check the temperature sensor selection in p0600 to p0603.
- replace the Sensor Module (hardware defect or incorrect calibration data).
Reaction upon F: NONE (IASC/DBRAKE, OFF1, OFF2, OFF3, STOP1, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

A32940 (F, N) Sensor 2: Spindle clamping state error
Message value: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause:
The spindle clamping state is incorrect.
Fault value (r0949, decimal interpretation):
Signal level from sensor S1.
Note:
A signal level of 500 mV corresponds to the numerical value 500 dec.
Remedy:
- Check the clamped tool.
- Check the tolerance and if required, adapt (p5040).
- Check the thresholds and if required, adapt (p5041).
- Check analog sensor S1 and connections.
Reaction upon F: NONE (IASC/DCBRAKE, OFF1, OFF2, OFF3, STOP1, STOP2)
Acknowl. upon F: IMMEDIATELY
Reaction upon N: NONE
Acknowl. upon N: NONE

A32999 (F, N) Encoder 2: Unknown alarm
Message value: New message: %1
Drive object: SERVO_S110-CAN, SERVO_S110-DP, SERVO_S110-PN
Reaction: NONE
Acknowledge: NONE
Cause:
A alarm has occurred on the Sensor Module for encoder 2 that cannot be interpreted by the Control Unit firmware.
This can occur if the firmware on this component is more recent than the firmware on the Control Unit.
Faults and alarms

List of faults and alarms

A50001 (F)  PROFINET configuration error

Message value: %1

Drive object: CU_S110-CAN, CU_S110-DP, CU_S110-PN

Reaction: NONE

Acknowledge: NONE

Cause: A PROFINET controller attempts to establish a connection using an incorrect configuring telegram. The "Shared Device" function has been activated (p8929 = 2).

Alarm value (r2124, interpret decimal):

- 10: A CPU sends a PROFIsafe telegram.
- 11: F CPU sends a PZD telegram.
- 12: F CPU without an A CPU.
- 13: F CPU with more PROFIsafe subslots than activated with p9601.3.
- 14: F CPU with fewer PROFIsafe subslots than activated with p9601.3.

See also: p8929 (PN remote controller number), p9601 (SI enable, functions integrated in the drive (processor 1))

Remedy: Check the configuration of the PROFINET controllers as well as the p8929 and p9601.3 setting.

A50020 (F)  PROFINET: Second controller missing

Message value: -

Drive object: CU_S110-CAN, CU_S110-DP, CU_S110-PN

Reaction: NONE

Acknowledge: NONE

Cause: The PROFINET function "Shared Device" has been activated (p8929 = 2). However, only the connection to a PROFINET controller is present.

Remedy: Check the configuration of the PROFINET controllers as well as the p8929 setting.

F50510  FBLOCKS: Logon of the run-time group rejected

Message value: -

Drive object: All objects

Reaction: NONE

Acknowledge: IMMEDIATELY

Cause: When the run-time groups of the free function blocks attempted to log on with the sampling time management, the logon of at least one run-time group was rejected.

Too many different hardware sampling times may have been assigned to the free function blocks.

Remedy: - check number of different hardware sampling times (r20008, r7903).
- if necessary, deactivate again the drive object on which the function module "free function blocks" was last activated (p0108[0...15].18 = 0). Then carry out a POWER ON.

Note: The assignment of drive object numbers to the index numbers of p0108[0...15] can be read out in p0101[0...15]: the assignment to the drive object types can be read out in p0107[0...15] on the drive object of the CU or CX (only with SM150).
### F50511
**FBLOCKS: Memory no longer available for free function blocks**

**Message value:** -

**Drive object:** All objects

**Reaction:** NONE

**Acknowledge:** IMMEDIATELY

**Cause:** When the free function blocks were activated, more memory was requested than was available on the Control Unit.

**Remedy:** Deactivate again the drive object on which the function module "free function blocks" was last activated (p0108[0...15].18 = 0). Then carry out a POWER ON.

**Note:** The assignment of drive object numbers to the index numbers of p0108[0...15] can be read out in p0101[0...15]; the assignment to the drive object types can be read out in p0107[0...15] on the drive object of the CU or CX (only with SM150).

### A50513 (F)
**FBLOCKS: Run sequence value already assigned**

**Message value:** -

**Drive object:** All objects

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:** An attempt was made to assign a run sequence value already assigned to a function block on this drive object to another additional function block on the same drive object. A run sequence value can only be precisely assigned to one function block on one drive object.

**Remedy:** Set another value that is still available on this drive object for the run sequence.

**Reaction upon F:** NONE

**Acknowl. upon F:** IMMEDIATELY

### A50514
**FBLOCKS: Sampling time of fixed run-time group differs**

**Message value:** -

**Drive object:** All objects

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:** The sampling time of a system function was set to a value (p0112, p0115) lower than the smallest permissible sampling time that is allowed for the fixed run-time group belonging to this system block (1 ms). The fixed run-time group involved is assigned as a minimum to one block.

**Remedy:** Using p0112 or p0115, increase the sampling time of the system function to the minimum permissible sampling time for the run-time groups of 1 ms or change the sampling time assignment of this run-time group in p20000[0...9].

### A50517
**FBLOCKS: Int. meas. active**

**Message value:** -

**Drive object:** All objects

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:** A Siemens internal measurement has been activated.

**Remedy:** Carry out a POWER ON (power off/on) for the Control Unit involved.

### F50518
**FBLOCKS: Sampling time of free run-time group differs at download**

**Message value:** %1

**Drive object:** All objects

**Reaction:** NONE

**Acknowledge:** IMMEDIATELY

**Cause:** In the STARTER/SCOUT project that was downloaded, the hardware sampling time of a free run-time group (1 <= p20000[i] <= 256) was set to a value that was either too low or too high. The sampling time must be between 1 ms and the value r20003 - r20002.

If the sampling time of the selected free run-time group is < 1 ms, the equivalent value of 1 ms is used. If the value >= r20003, then the sampling time is set to the next higher or the same software sampling time >= r21003.
Fault value (r0949, decimal interpretation):
Number of the p20000 index of the run-time group where the sampling time is incorrectly set.
Number of the run-time group = fault value + 1

Note:
For SIMOTION D410, r20003 (unlike all the other Control Units) is automatically set the same as the PROFIBUS sampling time.
See also: r20008 (Hardware sampling times available)

**Remedy:**
- correctly set the sampling time of the run-time group.
- if required, take all of the blocks from the run-time group.

Note:
Fault F50518 only detects an incorrectly parameterized run-time group. If, after correcting p20000[i] in the project, this error occurs again at download, then the run-time group involved should be identified using the fault value (r0949) and the sampling time correctly set.
## Appendix

### Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.1 ASCII table (excerpt)</td>
<td>A-1238</td>
</tr>
<tr>
<td>A.2 List for motor code/encoder code</td>
<td>A-1239</td>
</tr>
</tbody>
</table>
A.1 ASCII table (excerpt)

The following table includes the decimal and hexadecimal notation of selected ASCII characters.

Table A-1 ASCII table (excerpt)

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<tr>
<th>Character</th>
<th>Decimal</th>
<th>Hexadecimal</th>
<th>Character</th>
<th>Decimal</th>
<th>Hexadecimal</th>
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<td>-</td>
<td>45</td>
<td>2D</td>
<td>I</td>
<td>73</td>
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<td>47</td>
<td>Z</td>
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</table>
A.2 List for motor code/encoder code

A.2.1 Motor code

Induction motors (Version: 4402000)

Table A-2 Motor code for induction motors

<table>
<thead>
<tr>
<th>Order number</th>
<th>Motor type (p0300)</th>
<th>Motor code (p0301)</th>
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</thead>
<tbody>
<tr>
<td>1PH4103-4NF2x-xxxx</td>
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<td>10401</td>
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<tr>
<td>1PH4103-4xF5x-xxxx</td>
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<td>1PH4163-4xF5x-xxxx</td>
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<td>1PH4163-xxF2x(L37)</td>
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</table>
## List for motor code/encoder code

### Table A-2 Motor code for induction motors, continued

<table>
<thead>
<tr>
<th>Order number</th>
<th>Motor type (p0300)</th>
<th>Motor code (p0301)</th>
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<td>1PH7103-xxGxx-xLxx</td>
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Table A-2  Motor code for induction motors, continued

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### List for motor code/encoder code

#### Table A-2  Motor code for induction motors, continued

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### Table A-2  Motor code for induction motors, continued

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Synchronous motors (Version: 4402000)

Table A-3  Motor code for synchronous motors

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Table A-3  Motor code for synchronous motors, continued

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Table A-3  Motor code for synchronous motors, continued

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## Appendix

### List for motor code/encoder code

Table A-3  Motor code for synchronous motors, continued

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### Table A-3  Motor code for synchronous motors, continued

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## List for motor code/encoder code

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### Table A-3  Motor code for synchronous motors, continued

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Table A-3  Motor code for synchronous motors, continued

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### A.2.2 Encoder code

#### 1FK6 encoders

Table A-4 Encoder code for 1FK6 encoders

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<td>1FK6xxx-xxxxx-xSxx</td>
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<td>4p (2-speed), 6p (3-speed), 8p (4-speed)</td>
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<td>The pole number of the resolver corresponds to the pole number of the motor (see catalog).</td>
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#### 1FK7 encoders

Table A-5 Encoder code for 1FK7 encoders

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### 1FT6 encoders

Table A-6   Encoder code for 1FT6 encoders

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</table>

### 1PH4 encoders

Table A-7   Encoder code for 1PH4 encoders

<table>
<thead>
<tr>
<th>Order number</th>
<th>Encoder code (p0400)</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1PH4xxx-xNxxx-xxxx</td>
<td>2002</td>
<td>-</td>
</tr>
</tbody>
</table>

### 1PH7 encoders

Table A-8   Encoder code for 1PH7 encoders

<table>
<thead>
<tr>
<th>Order number</th>
<th>Encoder code (p0400)</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1PH7xxx-xExxx-xxxx</td>
<td>2051</td>
<td>-</td>
</tr>
<tr>
<td>1PH7xxx-xHxxx-xxxx</td>
<td>3002</td>
<td>-</td>
</tr>
<tr>
<td>1PH7xxx-xJxxx-xxxx</td>
<td>3003</td>
<td>-</td>
</tr>
<tr>
<td>1PH7xxx-xMxxx-xxxx</td>
<td>2001</td>
<td>-</td>
</tr>
<tr>
<td>1PH7xxx-xNxxx-xxxx</td>
<td>2002</td>
<td>-</td>
</tr>
<tr>
<td>1PH7xxx-xRxxx-xxxx</td>
<td>1001</td>
<td>-</td>
</tr>
</tbody>
</table>
# List of abbreviations

**Note:**
The following list of abbreviations includes all abbreviations and their meanings used in the entire SINAMICS family of drives.

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Source of abbreviation</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Alarm</td>
<td>Alarm</td>
</tr>
<tr>
<td>A...</td>
<td>Alternating Current</td>
<td>Alternating current</td>
</tr>
<tr>
<td>AC</td>
<td>Analog Digital Converter</td>
<td>A-D converter</td>
</tr>
<tr>
<td>AI</td>
<td>Analog Input</td>
<td>Analog input</td>
</tr>
<tr>
<td>AIM</td>
<td>Active Interface Module</td>
<td>Active Interface Module</td>
</tr>
<tr>
<td>ALM</td>
<td>Active Line Module</td>
<td>Active Line Module</td>
</tr>
<tr>
<td>AO</td>
<td>Analog Output</td>
<td>Analog output</td>
</tr>
<tr>
<td>AOP</td>
<td>Advanced Operator Panel</td>
<td>Advanced operator panel</td>
</tr>
<tr>
<td>APC</td>
<td>Advanced Positioning Control</td>
<td>Advanced positioning control</td>
</tr>
<tr>
<td>AR</td>
<td>Automatic Restart</td>
<td>Automatic restart</td>
</tr>
<tr>
<td>ASC</td>
<td>Armature Short-Circuit</td>
<td>Armature short-circuit</td>
</tr>
<tr>
<td>ASCII</td>
<td>American Standard Code for Information Interchange</td>
<td>American standard code for information interchange</td>
</tr>
<tr>
<td>ASM</td>
<td>Asynchronmotor</td>
<td>Induction motor</td>
</tr>
<tr>
<td>BB</td>
<td>Betriebsbedingung</td>
<td>Operating condition</td>
</tr>
<tr>
<td>BERO</td>
<td>Binector Input</td>
<td>Contactless proximity switch</td>
</tr>
<tr>
<td>BI</td>
<td>Binector Input</td>
<td>Binector input</td>
</tr>
<tr>
<td>BIA</td>
<td>Berufsgenossenschaftliches Institut für Arbe-Germany's Institute for Occupational Safety itssicherheit</td>
<td>Germany's Institute for Occupational Safety and Health</td>
</tr>
<tr>
<td>BICO</td>
<td>Binector Connector Technology</td>
<td>Binector connector technology</td>
</tr>
<tr>
<td>BLM</td>
<td>Basic Line Module</td>
<td>Basic Line Module</td>
</tr>
<tr>
<td>BO</td>
<td>Binector Output</td>
<td>Binector output</td>
</tr>
<tr>
<td>BOP</td>
<td>Basic Operator Panel</td>
<td>Basic operator panel</td>
</tr>
<tr>
<td>C</td>
<td>Capacitance</td>
<td>Capacitance</td>
</tr>
<tr>
<td>C...</td>
<td>-</td>
<td>Safety message</td>
</tr>
<tr>
<td>CAN</td>
<td>Controller Area Network</td>
<td>Serial bus system</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Source of abbreviation</td>
<td>Meaning</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------------------</td>
<td>---------</td>
</tr>
<tr>
<td>CBC</td>
<td>Communication Board CAN</td>
<td>Communication Board CAN</td>
</tr>
<tr>
<td>CD</td>
<td>Compact Disc</td>
<td>Compact Disc</td>
</tr>
<tr>
<td>CDS</td>
<td>Command Data Set</td>
<td>Command data set</td>
</tr>
<tr>
<td>CF Card</td>
<td>CompactFlash Card</td>
<td>CompactFlash memory card</td>
</tr>
<tr>
<td>CI</td>
<td>Connector Input</td>
<td>Connector input</td>
</tr>
<tr>
<td>CLC</td>
<td>Clearance Control</td>
<td>Clearance control</td>
</tr>
<tr>
<td>CNC</td>
<td>Computer Numerical Control</td>
<td>Computerized numerical control</td>
</tr>
<tr>
<td>CO</td>
<td>Connector Output</td>
<td>Connector output</td>
</tr>
<tr>
<td>CO/BO</td>
<td>Connector Output/Binector Output</td>
<td>Connector/binector output</td>
</tr>
<tr>
<td>COB ID</td>
<td>CAN Object Identification</td>
<td>CAN object identification</td>
</tr>
<tr>
<td>COM</td>
<td>Common contact of a changeover relay</td>
<td>Center contact on a changeover contact</td>
</tr>
<tr>
<td>COMM</td>
<td>Commissioning</td>
<td>Commissioning</td>
</tr>
<tr>
<td>CP</td>
<td>Communications Processor</td>
<td>Communications processor</td>
</tr>
<tr>
<td>CPU</td>
<td>Central Processing Unit</td>
<td>Central processing unit</td>
</tr>
<tr>
<td>CRC</td>
<td>Cyclic Redundancy Check</td>
<td>Cyclic redundancy check</td>
</tr>
<tr>
<td>CSM</td>
<td>Control Supply Module</td>
<td>Control Supply Module</td>
</tr>
<tr>
<td>CU</td>
<td>Control Unit</td>
<td>Control Unit</td>
</tr>
<tr>
<td>CUA</td>
<td>Control Unit Adapter</td>
<td>Control Unit Adapter</td>
</tr>
<tr>
<td>CUD</td>
<td>Control Unit DC MASTER</td>
<td>Control Unit DC MASTER</td>
</tr>
<tr>
<td>DAC</td>
<td>Digital Analog Converter</td>
<td>D-A converter</td>
</tr>
<tr>
<td>DC</td>
<td>Direct Current</td>
<td>DC current</td>
</tr>
<tr>
<td>DCB</td>
<td>Drive Control Block</td>
<td>Drive Control Block</td>
</tr>
<tr>
<td>DCBRK</td>
<td>DC Brake</td>
<td>DC brake</td>
</tr>
<tr>
<td>DCC</td>
<td>Drive Control Chart</td>
<td>Drive Control Chart</td>
</tr>
<tr>
<td>DCN</td>
<td>Direct Current Negative</td>
<td>DC current negative</td>
</tr>
<tr>
<td>DCP</td>
<td>Direct Current Positive</td>
<td>DC current positive</td>
</tr>
<tr>
<td>DDS</td>
<td>Drive Data Set</td>
<td>Drive data set</td>
</tr>
<tr>
<td>DI</td>
<td>Digital Input</td>
<td>Digital input</td>
</tr>
<tr>
<td>DI/DO</td>
<td>Digital Input/Digital Output</td>
<td>Digital input/output, bidirectional</td>
</tr>
<tr>
<td>DMC</td>
<td>DRIVE-CLiQ Hub Module Cabinet</td>
<td>DRIVE-CLiQ Hub Module Cabinet</td>
</tr>
<tr>
<td>DME</td>
<td>DRIVE-CLiQ Hub Module External</td>
<td>DRIVE-CLiQ Hub Module External</td>
</tr>
<tr>
<td>DO</td>
<td>Digital Output</td>
<td>Digital output</td>
</tr>
<tr>
<td>DO</td>
<td>Drive Object</td>
<td>Drive object</td>
</tr>
<tr>
<td>DP</td>
<td>Decentralized Peripherals</td>
<td>Distributed I/Os</td>
</tr>
<tr>
<td>DPRAM</td>
<td>Dual-Port Random Access Memory</td>
<td>Memory with dual access</td>
</tr>
<tr>
<td>DRAM</td>
<td>Dynamic Random Access Memory</td>
<td>Dynamic memory</td>
</tr>
<tr>
<td>DRIVE-CLiQ</td>
<td>Drive Component Link with IQ</td>
<td>Drive Component Link with IQ</td>
</tr>
<tr>
<td>DSC</td>
<td>Dynamic Servo Control</td>
<td>Dynamic Servo Control</td>
</tr>
<tr>
<td>DTC</td>
<td>Digital Time Clock</td>
<td>Time switch</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Source of abbreviation</td>
<td>Meaning</td>
</tr>
<tr>
<td>--------------</td>
<td>------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>EASC</td>
<td>External Armature Short-Circuit</td>
<td>External armature short-circuit</td>
</tr>
<tr>
<td>EDS</td>
<td>Encoder Data Set</td>
<td>Encoder data set</td>
</tr>
<tr>
<td>EGB</td>
<td>Elektrostatisch gefährdete Baugruppen</td>
<td>Electrostatically sensitive devices (ESD)</td>
</tr>
<tr>
<td>ELCB</td>
<td>Earth Leakage Circuit Breaker</td>
<td>Residual current operated circuit breaker</td>
</tr>
<tr>
<td>ELP</td>
<td>Earth Leakage Protection</td>
<td>Ground-fault monitoring</td>
</tr>
<tr>
<td>EMC</td>
<td>Electromagnetic Compatibility</td>
<td>Electromagnetic compatibility</td>
</tr>
<tr>
<td>EMF</td>
<td>Electromagnetic Force</td>
<td>Electromagnetic force</td>
</tr>
<tr>
<td>EMK</td>
<td>Elektromagnetische Kraft</td>
<td>Electromagnetic force</td>
</tr>
<tr>
<td>EMV</td>
<td>Elektromagnetische Verträglichkeit</td>
<td>Electromagnetic compatibility (EMC)</td>
</tr>
<tr>
<td>EN</td>
<td>Europäische Norm</td>
<td>European standard</td>
</tr>
<tr>
<td>EnDat</td>
<td>Encoder Data Interface</td>
<td>Encoder interface</td>
</tr>
<tr>
<td>EP</td>
<td>Enable Pulses</td>
<td>Pulse enable</td>
</tr>
<tr>
<td>EPOS</td>
<td>Einfachpositionierer</td>
<td>Basic positioner</td>
</tr>
<tr>
<td>ES</td>
<td>Engineering System</td>
<td>Engineering system</td>
</tr>
<tr>
<td>ESB</td>
<td>Ersatzschaltbild</td>
<td>Equivalent circuit diagram</td>
</tr>
<tr>
<td>ESD</td>
<td>Electrostatically Sensitive Devices</td>
<td>Electrostatically Sensitive Devices (ESD)</td>
</tr>
<tr>
<td>ESR</td>
<td>Extended Stop and Retract</td>
<td>Extended stop and retract</td>
</tr>
<tr>
<td>F</td>
<td>Fault</td>
<td>Fault</td>
</tr>
<tr>
<td>FAQs</td>
<td>Frequently Asked Questions</td>
<td>Frequently asked questions</td>
</tr>
<tr>
<td>FBL</td>
<td>Free Blocks</td>
<td>Free function blocks</td>
</tr>
<tr>
<td>FCC</td>
<td>Function Control Chart</td>
<td>Function Control Chart</td>
</tr>
<tr>
<td>FCC</td>
<td>Flux Current Control</td>
<td>Flux current control</td>
</tr>
<tr>
<td>FD</td>
<td>Function Diagram</td>
<td>Function diagram</td>
</tr>
<tr>
<td>F-DI</td>
<td>Failsafe Digital Input</td>
<td>Failsafe digital input</td>
</tr>
<tr>
<td>F-DO</td>
<td>Failsafe Digital Output</td>
<td>Failsafe digital output</td>
</tr>
<tr>
<td>FEM</td>
<td>Fremderregter Synchronmotor</td>
<td>Separately excited synchronous motor</td>
</tr>
<tr>
<td>FEPROM</td>
<td>Flash EPROM</td>
<td>Non volatile read/write memory</td>
</tr>
<tr>
<td>FG</td>
<td>Function Generator</td>
<td>Function generator</td>
</tr>
<tr>
<td>FI</td>
<td>-</td>
<td>Fault current</td>
</tr>
<tr>
<td>FOC</td>
<td>Fiber-Optic Cable</td>
<td>Fiber-optic cable</td>
</tr>
<tr>
<td>FP</td>
<td>Funktionsplan</td>
<td>Function diagram</td>
</tr>
<tr>
<td>FPGA</td>
<td>Field Programmable Gate Array</td>
<td>Field Programmable Gate Array</td>
</tr>
<tr>
<td>FW</td>
<td>Firmware</td>
<td>Firmware</td>
</tr>
<tr>
<td>GB</td>
<td>Gigabyte</td>
<td>Gigabyte</td>
</tr>
<tr>
<td>GC</td>
<td>Global Control</td>
<td>Global Control Telegram (Broadcast Telegramm)</td>
</tr>
<tr>
<td>GND</td>
<td>Ground</td>
<td>Reference potential for all signal and operating voltages, usually defined as 0 V (also referred to as G)</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Source of abbreviation</td>
<td>Meaning</td>
</tr>
<tr>
<td>--------------</td>
<td>------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>GSD</td>
<td>GSD file</td>
<td>Device master data file: Describes the characteristics of a PROFIBUS slave</td>
</tr>
<tr>
<td>GSV</td>
<td>Gate Supply Voltage</td>
<td>Gate supply voltage</td>
</tr>
<tr>
<td>GUID</td>
<td>Globally Unique Identifier</td>
<td>Globally unique identifier</td>
</tr>
<tr>
<td>H</td>
<td>High Frequency</td>
<td>High frequency</td>
</tr>
<tr>
<td>HFD</td>
<td>Hochfrequenzdrossel</td>
<td>High-frequency reactor</td>
</tr>
<tr>
<td>HLG</td>
<td>Hochlaufgeber</td>
<td>Ramp-function generator</td>
</tr>
<tr>
<td>HMI</td>
<td>Human Machine Interface</td>
<td>Human Machine Interface</td>
</tr>
<tr>
<td>HTL</td>
<td>High-Threshold Logic</td>
<td>Logic with a high fault threshold</td>
</tr>
<tr>
<td>HW</td>
<td>Hardware</td>
<td>Hardware</td>
</tr>
<tr>
<td>I</td>
<td>i. V. In Vorbereitung</td>
<td>Under development: This feature is not currently available</td>
</tr>
<tr>
<td>I/O</td>
<td>Input/Output</td>
<td>Input/output</td>
</tr>
<tr>
<td>I2C</td>
<td>Inter-Integrated Circuit</td>
<td>Internal serial data bus</td>
</tr>
<tr>
<td>IASC</td>
<td>Internal Armature Short-Circuit</td>
<td>Internal armature short-circuit</td>
</tr>
<tr>
<td>IBN</td>
<td>Inbetriebnahme</td>
<td>Commissioning</td>
</tr>
<tr>
<td>ID</td>
<td>Identifier</td>
<td>Identification</td>
</tr>
<tr>
<td>IE</td>
<td>Industrial Ethernet</td>
<td>Industrial Ethernet</td>
</tr>
<tr>
<td>IEC</td>
<td>International Electrotechnical Commission</td>
<td>International electrotechnical commission</td>
</tr>
<tr>
<td>IF</td>
<td>Interface</td>
<td>Interface</td>
</tr>
<tr>
<td>IGBT</td>
<td>Insulated Gate Bipolar Transistor</td>
<td>Insulated gate bipolar transistor</td>
</tr>
<tr>
<td>IGCT</td>
<td>Integrated Gate-Controlled Thyristor</td>
<td>Semiconductor circuit breaker with integrated control electrode</td>
</tr>
<tr>
<td>IL</td>
<td>Impulslöschung</td>
<td>Pulse suppression</td>
</tr>
<tr>
<td>IP</td>
<td>Internet Protocol</td>
<td>Internet Protocol</td>
</tr>
<tr>
<td>IPO</td>
<td>Interpolator</td>
<td>Interpolator</td>
</tr>
<tr>
<td>IT</td>
<td>Isolé Terré</td>
<td>Non-grounded three-phase power supply</td>
</tr>
<tr>
<td>IVP</td>
<td>Internal Voltage Protection</td>
<td>Internal voltage protection</td>
</tr>
<tr>
<td>J</td>
<td></td>
<td>Jogging</td>
</tr>
<tr>
<td>K</td>
<td>Kreuzweiser Datenvergleich</td>
<td>Crosswise data comparison</td>
</tr>
<tr>
<td>KIP</td>
<td>Kinetische Pufferung</td>
<td>Kinetic buffering</td>
</tr>
<tr>
<td>Kp</td>
<td>-</td>
<td>Proportional gain</td>
</tr>
<tr>
<td>KTY</td>
<td>-</td>
<td>Special temperature sensor</td>
</tr>
<tr>
<td>L</td>
<td></td>
<td>Formula symbol for inductance</td>
</tr>
<tr>
<td>LED</td>
<td>Light Emitting Diode</td>
<td>Light-emitting diode</td>
</tr>
<tr>
<td>LIN</td>
<td>Linear motor</td>
<td>Linear motor</td>
</tr>
<tr>
<td>LR</td>
<td>Lageregel</td>
<td>Position controller</td>
</tr>
</tbody>
</table>
## List of abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Source of abbreviation</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>LSB</td>
<td>Least Significant Bit</td>
<td>Least significant bit</td>
</tr>
<tr>
<td>LSC</td>
<td>Line-Side Converter</td>
<td>Line-side converter</td>
</tr>
<tr>
<td>LSS</td>
<td>Line Side Switch</td>
<td>Line side switch</td>
</tr>
<tr>
<td>LU</td>
<td>Length Unit</td>
<td>Length unit</td>
</tr>
<tr>
<td>LWL</td>
<td>Lichtwellenleiter</td>
<td>Fiber-optic cable</td>
</tr>
<tr>
<td>M</td>
<td>Masse (ground)</td>
<td>Reference potential for all signal and operating voltages, usually defined as 0 V (also referred to as GND)</td>
</tr>
<tr>
<td>MB</td>
<td>Megabyte</td>
<td>Megabyte</td>
</tr>
<tr>
<td>MCC</td>
<td>Motion Control Chart</td>
<td>Motion Control Chart</td>
</tr>
<tr>
<td>MDI</td>
<td>Manual Data Input</td>
<td>Manual data input</td>
</tr>
<tr>
<td>MDS</td>
<td>Motor Data Set</td>
<td>Motor data set</td>
</tr>
<tr>
<td>MLFB</td>
<td>Maschinenlesbare Fabrikatebezeichnung</td>
<td>Machine-Readable Product Code</td>
</tr>
<tr>
<td>MMC</td>
<td>Man-Machine Communication</td>
<td>Man-machine communication</td>
</tr>
<tr>
<td>MMS</td>
<td>Most Significant Bit</td>
<td>Most significant bit</td>
</tr>
<tr>
<td>MSC</td>
<td>Motor-Side Converter</td>
<td>Motor-side converter</td>
</tr>
<tr>
<td>MSCY_C1</td>
<td>Master Slave Cycle Class 1</td>
<td>Cyclic communication between master (Class 1) and slave</td>
</tr>
<tr>
<td>MSR</td>
<td>Motorstromrichter</td>
<td>Motor-side converter</td>
</tr>
<tr>
<td>MT</td>
<td>Probe</td>
<td>Probe</td>
</tr>
<tr>
<td>N</td>
<td>N. C.</td>
<td>Not connected</td>
</tr>
<tr>
<td>N...</td>
<td>No Report</td>
<td>No message or internal message</td>
</tr>
<tr>
<td>NAMUR</td>
<td>Normenerarbeitsgemeinschaft für Mess- und Regeltechnik in der chemischen Industrie</td>
<td>Standardization association for measurement and control in chemical industries</td>
</tr>
<tr>
<td>NC</td>
<td>Normally Closed (contact)</td>
<td>NC contact</td>
</tr>
<tr>
<td>NC</td>
<td>Numerical Control</td>
<td>Numerical control</td>
</tr>
<tr>
<td>NEMA</td>
<td>National Electrical Manufacturers Association</td>
<td>Standardization body in the USA (United States of America)</td>
</tr>
<tr>
<td>NM</td>
<td>Nullmarke</td>
<td>Zero mark</td>
</tr>
<tr>
<td>NO</td>
<td>Normally Open (contact)</td>
<td>NO contact</td>
</tr>
<tr>
<td>NSR</td>
<td>Netzstromrichter</td>
<td>Line-side converter</td>
</tr>
<tr>
<td>NVRAM</td>
<td>Non-Volatile Random Access Memory</td>
<td>Non-volatile read/write memory</td>
</tr>
<tr>
<td>OA</td>
<td>Open Architecture</td>
<td>Open Architecture</td>
</tr>
<tr>
<td>OC</td>
<td>Operating Condition</td>
<td>Operating condition</td>
</tr>
<tr>
<td>OEM</td>
<td>Original Equipment Manufacturer</td>
<td>Original equipment manufacturer</td>
</tr>
<tr>
<td>OLP</td>
<td>Optical Link Plug</td>
<td>Fiber-optic bus connector</td>
</tr>
<tr>
<td>OMI</td>
<td>Option Module Interface</td>
<td>Option module interface</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Source of abbreviation</td>
<td>Meaning</td>
</tr>
<tr>
<td>--------------</td>
<td>------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>p...</td>
<td>-</td>
<td>Adjustable parameters</td>
</tr>
<tr>
<td>P1</td>
<td>Processor 1</td>
<td>Processor 1</td>
</tr>
<tr>
<td>P2</td>
<td>Processor 2</td>
<td>Processor 2</td>
</tr>
<tr>
<td>PB</td>
<td>PROFIBUS</td>
<td>PROFIBUS</td>
</tr>
<tr>
<td>PcCtrl</td>
<td>PC Control</td>
<td>Control for master</td>
</tr>
<tr>
<td>PD</td>
<td>PROFIdrive</td>
<td>PROFIdrive</td>
</tr>
<tr>
<td>PDS</td>
<td>Power unit Data Set</td>
<td>Power unit data set</td>
</tr>
<tr>
<td>PE</td>
<td>Protective Earth</td>
<td>Protective earth (ground)</td>
</tr>
<tr>
<td>PELV</td>
<td>Protective Extra Low Voltage</td>
<td>Protective extra low voltage</td>
</tr>
<tr>
<td>PEM</td>
<td>Permanenterregter Synchronmotor</td>
<td>Permanent-magnet synchronous motor</td>
</tr>
<tr>
<td>PG</td>
<td>Programmiergerät</td>
<td>Programming device</td>
</tr>
<tr>
<td>PI</td>
<td>Proportional Integral</td>
<td>Proportional integral</td>
</tr>
<tr>
<td>PID</td>
<td>Proportional Integral Differential</td>
<td>Proportional integral differential</td>
</tr>
<tr>
<td>PLC</td>
<td>Programmable Logic Controller</td>
<td>Programmable logic controller</td>
</tr>
<tr>
<td>PLL</td>
<td>Phase-Locked Loop</td>
<td>Phase-locked loop</td>
</tr>
<tr>
<td>PN</td>
<td>PROFINET</td>
<td>PROFINET</td>
</tr>
<tr>
<td>PNO</td>
<td>PROFIBUS Nutzerorganisation</td>
<td>PROFIBUS user organization</td>
</tr>
<tr>
<td>PPI</td>
<td>Point-to-Point Interface</td>
<td>Point-to-point interface</td>
</tr>
<tr>
<td>PRBS</td>
<td>Pseudo Random Binary Signal</td>
<td>White noise</td>
</tr>
<tr>
<td>PROFIBUS</td>
<td>Process Field Bus</td>
<td>Serial data bus</td>
</tr>
<tr>
<td>PS</td>
<td>Power Supply</td>
<td>Power supply</td>
</tr>
<tr>
<td>PSA</td>
<td>Power Stack Adapter</td>
<td>Power Stack Adapter</td>
</tr>
<tr>
<td>PTC</td>
<td>Positive Temperature Coefficient</td>
<td>Positive temperature coefficient</td>
</tr>
<tr>
<td>PTP</td>
<td>Point-To-Point</td>
<td>Point-to-point</td>
</tr>
<tr>
<td>PWM</td>
<td>Pulse Width Modulation</td>
<td>Pulse width modulation</td>
</tr>
<tr>
<td>PZD</td>
<td>Prozessesdaten</td>
<td>Process data</td>
</tr>
<tr>
<td>r...</td>
<td>-</td>
<td>Display parameters (read-only)</td>
</tr>
<tr>
<td>RAM</td>
<td>Random Access Memory</td>
<td>Read/write memory</td>
</tr>
<tr>
<td>RCCB</td>
<td>Residual Current Circuit Breaker</td>
<td>Residual current operated circuit breaker</td>
</tr>
<tr>
<td>RCD</td>
<td>Residual Current Device</td>
<td>Residual current operated circuit breaker</td>
</tr>
<tr>
<td>RCM</td>
<td>Residual Current Monitor</td>
<td>Residual current monitor</td>
</tr>
<tr>
<td>RFG</td>
<td>Ramp-Function Generator</td>
<td>Ramp-function generator</td>
</tr>
<tr>
<td>RJ45</td>
<td>Registered Jack 45</td>
<td>Term for an 8-pin socket system for data transmission with shielded or non-shielded multi-wire copper cables</td>
</tr>
<tr>
<td>RKA</td>
<td>Rückkühlanlage</td>
<td>Cooling unit</td>
</tr>
<tr>
<td>RO</td>
<td>Read Only</td>
<td>Read only</td>
</tr>
<tr>
<td>RPDO</td>
<td>Receive Process Data Object</td>
<td>Receive process data object</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Source of abbreviation</td>
<td>Meaning</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>RS232</td>
<td>Recommended Standard 232</td>
<td>Interface standard for cable-connected serial data transmission between a sender and receiver (also known under EIA232)</td>
</tr>
<tr>
<td>RS485</td>
<td>Recommended Standard 485</td>
<td>Interface standard for a cable-connected differential, parallel, and/or serial bus system (data transmission between a number of senders and receivers, also known under EIA485)</td>
</tr>
<tr>
<td>RTC</td>
<td>Real Time Clock</td>
<td>Real time clock</td>
</tr>
<tr>
<td>RZA</td>
<td>Raumzeigerapproximation</td>
<td>Space vector approximation</td>
</tr>
<tr>
<td>S1</td>
<td>-</td>
<td>Continuous operation</td>
</tr>
<tr>
<td>S3</td>
<td>-</td>
<td>Intermittent operation</td>
</tr>
<tr>
<td>SAM</td>
<td>Safe Acceleration Monitor</td>
<td>Safe acceleration monitoring</td>
</tr>
<tr>
<td>SBC</td>
<td>Safe Brake Control</td>
<td>Safe brake control</td>
</tr>
<tr>
<td>SBH</td>
<td>Sicher Betriebshalt</td>
<td>Safe operating stop</td>
</tr>
<tr>
<td>SBR</td>
<td>Safe Brake Ramp</td>
<td>Safe brake ramp monitoring</td>
</tr>
<tr>
<td>SCA</td>
<td>Safe Cam</td>
<td>Safe cam</td>
</tr>
<tr>
<td>SD Card</td>
<td>SecureDigital Card</td>
<td>Secure digital memory card</td>
</tr>
<tr>
<td>SDI</td>
<td>Safe Direction</td>
<td>Safe motion direction</td>
</tr>
<tr>
<td>SE</td>
<td>Sicherer Software-Endschalter</td>
<td>Safe software limit switch</td>
</tr>
<tr>
<td>SG</td>
<td>Sicher reduzierte Geschwindigkeit</td>
<td>Safely reduced speed</td>
</tr>
<tr>
<td>SGA</td>
<td>Sicherheitsgerichteter Ausgang</td>
<td>Safety-related output</td>
</tr>
<tr>
<td>SGE</td>
<td>Sicherheitsgerichteter Eingang</td>
<td>Safety-related input</td>
</tr>
<tr>
<td>SH</td>
<td>Sicherer Halt</td>
<td>Safe standstill</td>
</tr>
<tr>
<td>SI</td>
<td>Safety Integrated</td>
<td>Safety Integrated</td>
</tr>
<tr>
<td>SIL</td>
<td>Safety Integrity Level</td>
<td>Safety Integrity Level</td>
</tr>
<tr>
<td>SLM</td>
<td>Smart Line Module</td>
<td>Smart Line Module</td>
</tr>
<tr>
<td>SLP</td>
<td>Safely-Limited Position</td>
<td>Safely-limited position</td>
</tr>
<tr>
<td>SLS</td>
<td>Safely Limited Speed</td>
<td>Safely limited speed</td>
</tr>
<tr>
<td>SLVC</td>
<td>Sensorless Vector Control</td>
<td>Vector control without sensor (encoder)</td>
</tr>
<tr>
<td>SM</td>
<td>Sensor Module</td>
<td>Sensor Module</td>
</tr>
<tr>
<td>SMC</td>
<td>Sensor Module Cabinet</td>
<td>Sensor Module Cabinet</td>
</tr>
<tr>
<td>SME</td>
<td>Sensor Module External</td>
<td>Sensor Module External</td>
</tr>
<tr>
<td>SMI</td>
<td>SINAMICS Sensor Module Integrated</td>
<td>SINAMICS Sensor Module Integrated</td>
</tr>
<tr>
<td>SN</td>
<td>Sicherer Software-Nocken</td>
<td>Safe software cam</td>
</tr>
<tr>
<td>SOS</td>
<td>Safe Operating Stop</td>
<td>Safe operating stop</td>
</tr>
<tr>
<td>SP</td>
<td>Service Pack</td>
<td>Service pack</td>
</tr>
<tr>
<td>SPC</td>
<td>Setpoint Channel</td>
<td>Setpoint channel</td>
</tr>
<tr>
<td>SPI</td>
<td>Serial Peripheral Interface</td>
<td>Serial interface for connecting peripherals</td>
</tr>
<tr>
<td>SPS</td>
<td>Speicherprogrammierbare Steuerung</td>
<td>Programmable logic controller</td>
</tr>
</tbody>
</table>
### List of abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Source of abbreviation</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>SS1</td>
<td>Safe Stop 1</td>
<td>Safe stop 1 (monitored for time and ramping up)</td>
</tr>
<tr>
<td>SS2</td>
<td>Safe Stop 2</td>
<td>Safe stop 2</td>
</tr>
<tr>
<td>SSI</td>
<td>Synchronous Serial Interface</td>
<td>Synchronous serial interface</td>
</tr>
<tr>
<td>SSM</td>
<td>Safe Speed Monitor</td>
<td>Safe feedback from speed monitor</td>
</tr>
<tr>
<td>SSP</td>
<td>SINAMICS Support Package</td>
<td>SINAMICS support package</td>
</tr>
<tr>
<td>STO</td>
<td>Safe Torque Off</td>
<td>Safe torque off</td>
</tr>
<tr>
<td>STW</td>
<td>Steuerwort</td>
<td>Control word</td>
</tr>
<tr>
<td>TB</td>
<td>Terminal Board</td>
<td>Terminal Board</td>
</tr>
<tr>
<td>TIA</td>
<td>Totally Integrated Automation</td>
<td>Totally Integrated Automation</td>
</tr>
<tr>
<td>TM</td>
<td>Terminal Module</td>
<td>Terminal module</td>
</tr>
<tr>
<td>TN</td>
<td>Terre Neutre</td>
<td>Grounded three-phase power supply</td>
</tr>
<tr>
<td>Tn</td>
<td>-</td>
<td>Integral time</td>
</tr>
<tr>
<td>TPDO</td>
<td>Transmit Process Data Object</td>
<td>Transmit process data object</td>
</tr>
<tr>
<td>TT</td>
<td>Terre Terre</td>
<td>Grounded three-phase power supply</td>
</tr>
<tr>
<td>TTL</td>
<td>Transistor-Transistor Logic</td>
<td>Transistor-transistor logic</td>
</tr>
<tr>
<td>Tv</td>
<td>-</td>
<td>Rate time</td>
</tr>
<tr>
<td>UL</td>
<td>Underwriters Laboratories Inc.</td>
<td>Underwriters Laboratories Inc.</td>
</tr>
<tr>
<td>UPS</td>
<td>Uninterruptible Power Supply</td>
<td>Uninterruptible power supply</td>
</tr>
<tr>
<td>USV</td>
<td>Unterbrechungsfreie Stromversorgung</td>
<td>Uninterruptible power supply</td>
</tr>
<tr>
<td>UTC</td>
<td>Universal Time Coordinated</td>
<td>Universal time coordinated</td>
</tr>
<tr>
<td>VC</td>
<td>Vector Control</td>
<td>Vector control</td>
</tr>
<tr>
<td>Vdc</td>
<td>-</td>
<td>DC link voltage</td>
</tr>
<tr>
<td>VdcN</td>
<td>-</td>
<td>Partial DC link voltage, negative</td>
</tr>
<tr>
<td>VdcP</td>
<td>-</td>
<td>Partial DC link voltage, positive</td>
</tr>
<tr>
<td>VDE</td>
<td>Verband Deutscher Elektrotechniker</td>
<td>Association of German Electrical Engineers</td>
</tr>
<tr>
<td>VDI</td>
<td>Verein Deutscher Ingenieure</td>
<td>Association of German Engineers</td>
</tr>
<tr>
<td>VPM</td>
<td>Voltage Protection Module</td>
<td>Voltage Protection Module</td>
</tr>
<tr>
<td>Vpp</td>
<td>Volt peak to peak</td>
<td>Volt peak to peak</td>
</tr>
<tr>
<td>VSM</td>
<td>Voltage Sensing Module</td>
<td>Voltage Sensing Module</td>
</tr>
<tr>
<td>WEA</td>
<td>Wiedereinschaltautomatik</td>
<td>Automatic restart</td>
</tr>
<tr>
<td>WZM</td>
<td>Werkzeugmaschine</td>
<td>Machine tool</td>
</tr>
<tr>
<td>XML</td>
<td>Extensible Markup Language</td>
<td>Standard language for Web publishing and document management</td>
</tr>
</tbody>
</table>
## List of abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Source of abbreviation</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Z</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ZK</td>
<td>Zwischenkreis</td>
<td>DC link</td>
</tr>
<tr>
<td>ZM</td>
<td>Zero Mark</td>
<td>Zero mark</td>
</tr>
<tr>
<td>ZSW</td>
<td>Zustandswort</td>
<td>Status word</td>
</tr>
</tbody>
</table>
Index

Numbers
1020  Explanation of the symbols (Part 1), 2-754
1021  Explanation of the symbols (Part 2), 2-755
1022  Explanation of the symbols (Part 3), 2-756
1030  Handling BICO technology, 2-757
1510  CU305 input/output terminals, 2-759
1520  PROFIdrive, 2-760
1530  Internal control/status words, data sets, 2-761
1550  Setpoint channel, 2-762
1580  Servo control, encoder evaluation (position, speed, temperature), 2-763
1590  Servo control, speed control and U/f-control, 2-764
1610  Servo control, generation of the torque limits, 2-765
1630  Servo control, current control, 2-766
1750  Monitoring functions, faults, alarms, 2-767
2020  CU305 Digital inputs/output terminals, electrically isolated (DI 0 ... DI 3), 2-769
2021  CU305 Digital inputs/output terminals, electrically isolated (DI 16 ... DI 19), 2-770
2022  CU305 Digital inputs/output terminals, electrically isolated (DI 20 to DI 22), 2-771
2030  CU305 Digital inputs/outputs, bidirectional (DI/DO 8 to DI/DO 9), 2-772
2031  CU305 Digital inputs/outputs, bidirectional (DI/DO 10 to DI/DO 11), 2-773
2038  CU305 digital output (DO 16), 2-774
2040  CU305 Analog input (AI), 2-775
2410  PROFIBUS (PB), addresses and diagnostics, 2-778
2420  Standard telegrams and process data, 2-779
2422  Manufacturer-specific telegrams and process data, 2-780
2424  Manufacturer-specific/free telegrams and process data, 2-781
2439  PZD receive signals, interconnection profile-specific, 2-782
2440  PZD receive signals, interconnection manufacturer-specific, 2-783
2442  STW1 control word interconnection (p2038 = 0), 2-784
2443  STW1 control word interconnection (p2038 = 1), 2-785
2444  STW2 control word interconnection (p2038 = 0), 2-786
2445  STW2 control word interconnection (p2038 = 1), 2-787
2449  PZD send signals, interconnection profile-specific, 2-788
PZD send signals, interconnection manufacturer-specific, 2-789

ZSW1 status word interconnection (p2038 = 0), 2-790

ZSW1 status word interconnection (p2038 = 1), 2-791

ZSW2 status word interconnection (p2038 = 0), 2-792

ZSW2 status word interconnection (p2038 = 1), 2-793

MELDW status word interconnection, 2-794

PosSTW-Pos control word interconnection (r0108.4 = 1), 2-795

POS_STW1 positioning control word 1 interconnection (r0108.4 = 1), 2-796

POS_STW2 positioning control word 2 interconnection (r0108.4 = 1), 2-797

POS_ZSW1 positioning status word 1 interconnection (r0108.4 = 1), 2-798

POS_ZSW2 positioning status word 2 interconnection (r0108.4 = 1), 2-799

IF1 receive telegram, free interconnection via BICO (p0922 = 999), 2-800

IF1 send telegram, free interconnection via BICO (p0922 = 999), 2-801

IF1 status words, free interconnection, 2-802

STW1 control word 1 interconnection (r0108.4 = 1), 2-803

SATZANW-Pos block selection interconnection (r0108.4 = 1), 2-804

ZSW1 status word 1 interconnection (r0108.4 = 1), 2-805

MDIMode interconnection (r0108.4 = 1), 2-806

IF1 receive telegram, free interconnection via BICO (p0922 = 999), 2-807

IF1 send telegram, free interconnection via BICO (p0922 = 999), 2-808

CU_STW control word, Control Unit interconnection, 2-809

CU_ZSW status word, Control Unit interconnection, 2-810

A_DIGITAL interconnection, 2-811

E_DIGITAL interconnection, 2-812

Control word, sequence control, 2-814

Status word, sequence control, 2-815

Control word, setpoint channel, 2-816

Control word, speed controller, 2-817

Status word, speed controller, 2-818

Status word, closed-loop control, 2-819

Status word, closed-loop current control, 2-820

Status word, monitoring functions 1, 2-821

Status word, monitoring functions 2, 2-822

Status word, monitoring functions 3, 2-823

Control word, faults/alarms, 2-824

Status word, faults/alarms 1 and 2, 2-825

Sequencer, 2-827

Missing enable signals, line contactor control, 2-828
2701
Basic brake control (r0108.14 = 0), 2-830
2704
Extended brake control, zero-speed
detection (r0108.14 = 1), 2-831
2707
Extended brake control, open/close brake
(r0108.14 = 1), 2-832
2711
Extended brake control, signal outputs
(r0108.14 = 1), 2-833
2800
Basic Functions, parameter manager, 2-835
2802
Basic functions, monitoring functions and
faults/alarms, 2-836
2804
Basic Functions, status words, 2-837
2810
Basic Functions, STO (Safe Torque
Off)/SS1 (Safe Stop 1), 2-838
2811
Basic Functions, STO (Safe Torque Off),
safe pulse cancellation, 2-839
2814
Basic Functions,
SBC (Safe Brake Control), 2-840
2820
Extended Functions,
SLS (Safely-Limited Speed), 2-841
2825
Extended Functions, SS1, SS2, SOS,
Internal STOP B, C, D, F, 2-842
2840
Extended Functions, control word and
status word, 2-843
2846
Extended Functions, parameter manager,
2-844
2850
Extended Functions (F-DI 0 ... F-DI 2),
2-845
2853
Extended Functions (F-DO/ 0), 2-846
2855
Extended Functions, control interface,
2-847
2856
Extended Functions, Safe State selection,
2-848
2857
Extended Functions, assignment
(F-DO 0), 2-849
2858
Extended Functions, control via
PROFIsafe (p9601.2 = p9601.3 = 1),
2-850
2860
Extended Functions, SSM (Safe Speed
Monitor), 2-851
2861
Extended Functions, SDI (Safe Direction),
2-852
3010
Fixed speed setpoints, 2-854
3020
Motorized potentiometer, 2-855
3030
Main/supplementary setpoint, setpoint
scaling, jogging, 2-856
3040
Direction limitation and direction reversal,
2-857
3050
Skip frequency bands and speed
limitations, 2-858
3060
Basic ramp-function generator, 2-859
3070
Extended ramp-function generator, 2-860
3080
Ramp-function generator selection, status
word, tracking, 2-861
3095
Generating the speed limits (r0108.8 = 0),
2-863
3610
Jog mode (r0108.4 = 1), 2-865
3612
Referencing/reference point approach
mode (r0108.4 = 1)
(p2597 = 0-signal), 2-866
3614
Flying referencing mode (r0108.4 = 1)
(p2597 = 1 signal), 2-867
3615
Traversing blocks, external block change
mode (r0108.4 = 1), 2-868
3616
Traversing blocks mode (r0108.4 = 1),
2-869
3617
Travel to fixed stop (r0108.4 = 1), 2-870
Index

3618
  Direct setpoint input/MDI mode, dynamic values (r0108.4 = 1), 2-871
3620
  Direct setpoint input/MDI mode (r0108.4 = 1), 2-872
3625
  Mode control (r0108.4 = 1), 2-873
3630
  Traversing range limits (r0108.4 = 1), 2-874
3635
  Interpolator (r0108.4 = 1), 2-875
3640
  Control word block selection/MDI selection (r0108.4 = 1), 2-876
3645
  Status word 1 (r0108.3 = 1, r0108.4 = 1), 2-877
3646
  Status word 2 (r0108.3 = 1, r0108.4 = 1), 2-878
3650
  Status word, active traversing block/MDI active (r0108.4 = 1), 2-879
4010
  Position actual value preprocessing (r0108.3 = 1), 2-881
4015
  Position controller (r0108.3 = 1), 2-882
4020
  Standstill/positioning monitoring (r0108.3 = 1), 2-883
4025
  Dynamic following error monitoring, cam controllers (r0108.3 = 1), 2-884
4704
  Position and temperature sensing, encoders 1 ... 2, 2-886
4710
  Speed actual value and pole position sensing, motor encoder (encoder 1), 2-887
4720
  Encoder interface, receive signals, encoders 1 ... 2, 2-888
4730
  Encoder interface, send signals, encoders 1 ... 2, 2-889
4735
  Reference mark search with equivalent zero mark, encoders 1, 2-890
4740
  Measuring probe evaluation, measured value memory, encoders 1 to 2, 2-891
5020
  Speed setpoint filter and speed pre-control, 2-893
5030
  Reference model/pre-control balancing/speed limitation, 2-894
5040
  Speed controller with encoder, 2-895
5042
  Speed controller, torque/speed pre-control with encoder (p1402 = 1), 2-896
5050
  Kp_n-/Tn_n adaptation, 2-897
5060
  Torque setpoint, control type changeover, 2-898
5210
  Speed controller without encoder, 2-899
5300
  U/f control for diagnostics, 2-900
5301
  Signaling function variable, 2-901
5490
  Speed control configuration, 2-902
5610
  Torque limiting/reduction/interpolator, 2-903
5620
  Motoring/generating torque limit, 2-904
5630
  Upper/lower torque limit, 2-905
5640
  Mode changeover, power/current limiting, 2-906
5650
  Vdc_max controller and Vdc_min controller, 2-907
5710
  Current setpoint filter, 2-908
5714
  Iq and Id controller, 2-909
5722
  Field current/flux input, flux reduction, flux controller, 2-910
5730
  Interface to the Motor Module (gating signals, current actual values), 2-911
7014  
  External Armature Short-Circuit (EASC, p0300 = 2xx or 4xx), 2-913
7017  
  DC brake (p0300 = 1xx), 2-914
7200  
  General information, 2-916
7210  
  AND (AND function block with 4 inputs), 2-917
7212  
  OR (OR function block with 4 inputs), 2-918
7214  
  XOR (XOR function block with 4 inputs), 2-919
7216  
  NOT (inverter), 2-920
7220  
  ADD (adder with 4 inputs), SUB (subtractor), 2-921
7222  
  MUL (multiplier), DIV (divider), 2-922
7224  
  AVA (absolute value generator), 2-923
7230  
  MFP (pulse generator), PCL (pulse contractor), 2-924
7232  
  PDE (ON delay), PDF (OFF delay), 2-925
7234  
  PST (pulse stretcher), 2-926
7240  
  RSR (RS flip-flop), DFR (D flip-flop), 2-927
7250  
  BSW (binary switch), NSW (numeric switch), 2-928
7260  
  LIM (limiter), 2-929
7262  
  PT1 (smoothing element), 2-930
7264  
  INT (integrator), DIF (derivative-action element), 2-931
7270  
  LVM (double-sided limit monitor with hysteresis), 2-932
7950  
  Fixed values (r0108.16 = 1), 2-934
7951  
  Fixed values, direct selection (p2216 = 1), 2-935
7954  
  Motorized potentiometer (r0108.16 = 1), 2-936
7958  
  Closed-loop control (r0108.16 = 1), 2-937
8010  
  Speed signals 1, 2-939
8011  
  Speed signals 2, 2-940
8012  
  Torque signals, motor locked/stalled, 2-941
8014  
  Thermal monitoring, power unit, 2-942
8016  
  Thermal monitoring, motor, 2-943
8060  
  Fault buffer, 2-945
8065  
  Alarm buffer, 2-946
8070  
  Fault/alarm trigger word (r2129), 2-947
8075  
  Fault/alarm configuration, 2-948
8134  
  Measuring sockets, 2-949
8560  
  Command Data Sets (CDS), 2-951
8565  
  Drive Data Sets (DDS), 2-952
8570  
  Encoder Data Sets (EDS), 2-953
8575  
  Motor Data Sets (MDS), 2-954
9204  
  Receive telegram, free PDO mapping (p8744 = 2), 2-956
9206  
  Receive telegram, Predefined Connection Set (p8744 = 1), 2-957
9208  
  Send telegram, free PDO mapping (p8744 = 2), 2-958
9210  
  Send telegram, Predefined Connection Set (p8744 = 1), 2-959
9220  
  Control word, CANopen, 2-960
Index

9226
  Status word, CANopen, 2-961
9912
  BOP20 control word interconnection, 2-963

A
Access level (parameter), 1-17
Acknowledgment
  Adjustable, 3-972
  Default, 3-972
  IMMEDIATELY, 3-969
  POWER ON, 3-969
  PULSE INHIBIT, 3-969
Address
  PROFIBUS, 2-778
  Technical Support, Preface-7
Adjustable parameters, 1-13
Alarm
  Cause, 3-972
  Display, 3-966
  Drive object, 3-971
  Explanation of list, 3-970
  Fault location, 3-971
  General information, 3-966
  How to distinguish an alarm from a fault, 3-966
  List of all alarms, 3-975
  Message value, 3-971
  Name, 3-971
  Number, 3-970
  Number range, 3-975
  Remedy, 3-972
Alarm buffer, 2-944
Alarm value, 3-972
ASCII table, A-1238
Axxxx, 3-970

B
Basic Operator Panel (BOP), 2-962
Basic positioner (EPOS), 2-864
BI, Binector Input, 1-14
BICO technology, 2-757
Binector
  Input (BI), 1-14
  Output (BO), 1-14
Bit array (parameter), 1-24
BO, Binector Output, 1-14
Brake control, 2-829

C
C1(x) - Status commissioning device, 1-16
C2(x) - Status commissioning drive, 1-16
Calculated (parameter), 1-17
Can be changed (parameter, C1(x), C2(x), U, T), 1-16
CANopen interface, 2-955
CDS, Command Data Set, 2-950, 2-951
CDS, command data set, 1-19
CI, Connector Input, 1-14
CO, Connector Output, 1-14
CO/BO, Connector/Binector Output, 1-14
Command data sets, 2-950
Configuring messages, 2-944
Connector
  Input (CI), 1-14
  Output (CO), 1-14
Control
  Servo, 2-892
  Technology controller, 2-937
Control type, 2-898
Control Unit 305 (CU305)
  Digital inputs, 2-768
  Digital inputs/outputs, 2-768
Control words, 2-776
  Internal, 2-813
  Standard telegrams, 2-776
Converter
  Binector/connector, 2-802
  Connector/binector, 2-800, 2-807
Cxxxxx, 3-970

D
Data set, 1-19, 2-950
  Command data set, 1-19
  Command data set, DDS, 1-19
  Drive data set, 1-19
  Drive data set, DDS, 1-19
  Encoder data set, 1-19
  Encoder data set, EDS, 1-19
  Motor data set, 1-19
  Motor data set, MDS, 1-19
  Power unit data set, 1-19
  Power unit data set, PDS, 1-19
Data type (parameter, signal source), 1-18
DCBRAKE, 3-968
DDS, Drive Data Set, 2-950, 2-952
DDS, drive data set, 1-19
Dependency (parameter), 1-24
Description (parameter), 1-24
Digital inputs
  Control Unit 305 (CU305), 2-768
Index

Digital inputs/outputs
Control Unit 305 (CU305), 2-768
Digital outputs
Control Unit 305 (CU305), 2-768
Direction limitation, 2-853
Direction reversal, 2-853
Display
Alarms, 3-966
Faults, 3-966
Display parameters, 1-13
DO, Drive Object, 1-14
Drive data sets, 2-950
Drive object, 1-14

E
EC Declaration of Conformity, Preface-7
EDS, Encoder Data Set, 2-950, 2-953
EDS, encoder data set, 1-19
Effective (parameter, C1(x), C2(x), U, T), 1-16
ENCODER, 3-968
Encoder code, A-1260
Encoder data sets, 2-950
Encoder evaluation, 2-885
Expert list, 1-23
Explanations on function diagrams, 2-753

F
Factory setting, 1-23
Fault
Acknowledgment, 3-969, 3-972
Cause, 3-972
Display, 3-966
Drive object, 3-971
Explanation of list, 3-970
Fault location, 3-971
Fault reaction, 3-967, 3-971
General information, 3-966
How to distinguish a fault from an alarm, 3-966
List of all faults, 3-975
Message value, 3-971
Name, 3-971
Number, 3-970
Number range, 3-975
Remedy, 3-972
Fault buffer, 2-944
Structure, 2-945
Fault value, 3-972
Fixed speed setpoints, 2-853
Fixed values, 2-755, 2-934
Free function blocks, 2-915
Free interconnection via BICO, 2-776
Free interconnection, status words, 2-802
Function (parameter), 1-24
Function diagrams, Basic Operator Panel 20 (BOP20)
Control word BOP20 interconnection, 2-963
Function diagrams, basic positioner (EPOS)
Control word block selection/MDI selection (r0108.4 = 1), 2-876
Direct setpoint input/MDI mode (r0108.4 = 1), 2-872
Direct setpoint input/MDI mode, dynamic values (r0108.4 = 1), 2-871
Flying referencing mode (r0108.4 = 1)
(p2597 = 1 signal), 2-867
Interpolator (r0108.4 = 1), 2-875
Jog mode (r0108.4 = 1), 2-865
Mode control (r0108.4 = 1), 2-873
Referencing/reference point approach mode (r0108.4 = 1)
(p2597 = 0-signal), 2-866
Status word 1 (r0108.3 = 1, r0108.4 = 1), 2-877
Status word 2 (r0108.3 = 1, r0108.4 = 1), 2-878
Status word, active traversing block/MDI active (r0108.4 = 1), 2-879
Travel to fixed stop (r0108.4 = 1), 2-870
Traversing blocks mode (r0108.4 = 1), 2-869
Traversing blocks, external block change mode (r0108.4 = 1), 2-868
Traversing range limits (r0108.4 = 1), 2-874
Function diagrams, brake control
Basic brake control (r0108.14 = 0), 2-830
Extended brake control, open/close brake (r0108.14 = 1), 2-832
Extended brake control, signal outputs (r0108.14 = 1), 2-833
Extended brake control, zero-speed detection (r0108.14 = 1), 2-831
Function diagrams, CANopen interface
Control word, CANopen, 2-960
Receive telegram, free PDO mapping (p8744 = 2), 2-956
Receive telegram, Predefined Connection Set (p8744 = 1), 2-957
Send telegram, free PDO mapping (p8744 = 2), 2-958
Send telegram, Predefined Connection Set (p8744 = 1), 2-959
Status word, CANopen, 2-961
Function diagrams, CU305 input/output terminals
- Analog input (AI), 2-775
- Digital inputs, electrically isolated (DI 0 to DI 3), 2-769
- Digital inputs, electrically isolated (DI 16 to DI 19), 2-770
- Digital inputs, electrically isolated (DI 20 to DI 22), 2-771
- Digital inputs/outputs, bidirectional (DI/DO 10 to DI/DO 11), 2-773
- Digital inputs/outputs, bidirectional (DI/DO 8 to DI/DO 9), 2-772
- Digital output (DO 16), 2-774

Function diagrams, data sets
- Command Data Sets (CDS), 2-951
- Drive Data Sets (DDS), 2-952
- Encoder Data Sets (EDS), 2-953
- Motor Data Sets (MDS), 2-954

Function diagrams, diagnostics
- Alarm buffer, 2-946
- Fault buffer, 2-945
- Fault/alarm configuration, 2-948
- Fault/alarm trigger word (r2129), 2-947
- Measuring sockets, 2-949

Function diagrams, encoder evaluation
- Encoder interface, receive signals, encoders 1 ... 2, 2-888
- Encoder interface, send signals, encoders 1 ... 2, 2-889
- Measuring probe evaluation, measured value memory, encoders 1 to 2, 2-891
- Position and temperature sensing, encoders 1 ... 2, 2-886
- Reference mark search with equivalent zero mark, encoders 1, 2-890
- Speed actual value and pole position sensing, motor encoder (encoder 1), 2-887

Function diagrams, explanations
- Explanation of the symbols (Part 1), 2-754
- Explanation of the symbols (Part 2), 2-755
- Explanation of the symbols (Part 3), 2-756
- Handling BICO technology, 2-757

Function diagrams, free function blocks
- ADD (adder), 2-921
- AND, 2-917
- AVA (absolute value generator), 2-923
- BSW (binary switch), 2-928
- DFR (D flip-flop), 2-927
- DIF (derivative-action element), 2-931
- DIV (divider), 2-922
- General information, 2-916
- INT (integrator), 2-931
- LIM (limiter), 2-929
- LVM (limit monitor), 2-932
- MFP (pulse generator), 2-924
- MUL (multiplier), 2-922
- NOT (inverter), 2-920
- NSW (numeric switch), 2-928
- OR, 2-918
- PCL (pulse contractor), 2-924
- PDE (ON delay), 2-925
- PDF (OFF delay), 2-925
- PST (pulse stretcher), 2-926
- PT1 (smoothing element), 2-930
- RSR (RS flip-flop), 2-927
- SUB (subtractor), 2-921
- XOR (exclusive OR), 2-919

Function diagrams, internal control/status words
- Control word, faults/alarms, 2-824
- Control word, sequence control, 2-814
- Control word, setpoint channel, 2-816
- Control word, speed controller, 2-817
- Status word, closed-loop control, 2-819
- Status word, closed-loop current control, 2-820
- Status word, faults/alarms 1 and 2, 2-825
- Status word, monitoring functions 1, 2-821
- Status word, monitoring functions 2, 2-822
- Status word, monitoring functions 3, 2-823
- Status word, sequence control, 2-815
- Status word, speed controller, 2-818
Function diagrams, overviews
  CU305 input/output terminals, 2-759
  Internal control/status words, data sets, 2-761
  Monitoring functions, faults, alarms, 2-767
  PROFIdrive, 2-760
  Servo control, current control, 2-766
  Servo control, encoder evaluation (position, speed, temperature), 2-763
  Servo control, generation of the torque limits, 2-765
  Servo control, speed control and U/f-control, 2-764
  Setpoint channel, 2-762
Function diagrams, position control
  Cam controller (r0108.3 = 1), 2-884
  Dynamic following error monitoring (r0108.3 = 1), 2-884
  Position actual value preprocessing (r0108.3 = 1), 2-881
  Position controller (r0108.3 = 1), 2-882
  Standstill/positioning monitoring (r0108.3 = 1), 2-883
Function diagrams, PROFIdrive
  A_DIGITAL interconnection, 2-811
  CU_STW control word, Control Unit interconnection, 2-809
  CU_ZSW status word, Control Unit interconnection, 2-810
  E_DIGITAL interconnection, 2-812
  IF1 receive telegram, free interconnection via BICO (p0922 = 999), 2-800, 2-807
  IF1 send telegram, free interconnection via BICO (p0922 = 999), 2-801, 2-808
  IF1 status words, free interconnection, 2-802
  Manufacturer-specific telegrams and process data, 2-780
  Manufacturer-specific/free telegrams and process data, 2-781
  MDIMode interconnection (r0108.4 = 1), 2-806
  MELDW status word interconnection, 2-794
  POS_STW1 positioning control word 1 interconnection (r0108.4 = 1), 2-796
  POS_STW2 positioning control word 2 interconnection (r0108.4 = 1), 2-797
  POS_ZSW1 positioning status word 1 interconnection (r0108.4 = 1), 2-798
  POS_ZSW2 positioning status word 2 interconnection (r0108.4 = 1), 2-799
  PosSTW-Pos control word interconnection (r0108.4 = 1), 2-795
  PROFIBUS (PB), addresses and diagnostics, 2-778
  PZD receive signals, interconnection manufacturer-specific, 2-783
  PZD receive signals, interconnection profile-specific, 2-782
  PZD send signals, interconnection manufacturer-specific, 2-789
  PZD send signals, interconnection profile-specific, 2-788
  SATZANW-Pos block selection interconnection (r0108.4 = 1), 2-804
  Standard telegrams and process data, 2-779
  STW1 control word 1 interconnection (r0108.4 = 1), 2-803
  STW1 control word interconnection (p2038 = 0), 2-784
  STW1 control word interconnection (p2038 = 1), 2-785
  STW2 control word interconnection (p2038 = 0), 2-786
  STW2 control word interconnection (p2038 = 1), 2-787
  ZSW1 status word 1 interconnection (r0108.4 = 1), 2-805
  ZSW1 status word interconnection (p2038 = 0), 2-790
  ZSW1 status word interconnection (p2038 = 1), 2-791
  ZSW2 status word interconnection (p2038 = 0), 2-792
  ZSW2 status word interconnection (p2038 = 1), 2-793
Function diagrams, signals and monitoring functions
  Speed signals 1, 2-939
  Speed signals 2, 2-940
  Thermal monitoring, motor, 2-943
  Thermal monitoring, power unit, 2-942
  Torque signals, motor locked/stalled, 2-941
Function diagrams, technology controller
  Closed-loop control (r0108.16 = 1), 2-937
  Fixed values (r0108.16 = 1), 2-934
  Fixed values, direct selection (p2216 = 1), 2-935
  Motorized potentiometer (r0108.16 = 1), 2-936
Function diagrams, technology functions
  DC brake (p0300 = 1xx), 2-914
  External Armature Short-Circuit (EASC, p0300 = 2xx or 4xx), 2-913
Function module, 1-14
Fxxxx, 3-970
G
General information
  about parameters, 1-12
  on faults and alarms, 3-966
  on function diagrams, 2-753
H
Hotline, Preface-7
I
IASC, 3-968
Index
  Factory setting, 1-24
  Parameter, 1-13, 1-24
Information
  Hotline, Preface-7
  Product information, Preface-6
  Technical Support, Preface-7
Input terminals
  Control Unit 305 (CU305), 2-768
  Internal control/status words, 2-813
J
  Jogging, 2-853, 2-856
L
  Line contactor control, 2-828
  Linked parameter, 1-13
List
  Abbreviations, B-1263
  ASCII table, A-1238
  Complete table of contents, Contents-9
  Encoder code, A-1260
  Faults and alarms, 3-975
  List of abbreviations, B-1263
  Message ranges, 3-975
  Motor code, A-1239
  Parameter ranges, 1-26
  Parameters for command data sets, 1-733
  Parameters for drive data sets, 1-735
  Parameters for encoder data sets, 1-739
  Parameters for motor data sets, 1-741
  Parameters for power unit data sets, 1-743
  Parameters, all, 1-29
  Table of contents, function diagrams, 2-746
  List of abbreviations, B-1263
  Load monitoring (r0108.17 = 1), 2-938
M
Main/supplementary setpoint, 2-853
Manufacturer-specific telegrams, 2-776
MDS, Motor Data Set, 2-950, 2-954
MDS, motor data set, 1-19
Measuring sockets, 2-944
Message buffer, 2-944
Message value, 3-971
Missing enable signals
  Drive, 2-828
Monitoring functions, 2-938
Motor code, A-1239
Motor data sets, 2-950
Motorized potentiometer, 2-853, 2-936
N
Name
  Alarm, 3-971
  Fault, 3-971
  Parameter, 1-14
Not for motor type, 1-23
Number
  Alarm, 3-970
  Fault, 3-970
  Parameter, 1-13
Index

Number range
   Alarms, 3-975
   Faults, 3-975
   Parameter, 1-26

O
   Object, 1-14
   OFF1, 3-967
   OFF1_DELAYED, 3-967
   OFF2, 3-967
   OFF3, 3-968

Output terminals
   Control Unit 305 (CU305), 2-768

P
   P group (parameter), 1-20
   Parameter
      Access level, 1-17
      Calculated, 1-17
      Can be changed, 1-16
      Data type, 1-18
      Description, 1-24
      Dynamic index, 1-19
      Expert list, 1-23
      Full name, 1-14
      Function, 1-24
      Index, 1-13, 1-24
      Linked parameter, 1-13
      List of all parameters, 1-29
      List of parameters for command data sets, 1-733
      List of parameters for drive data sets, 1-735
      List of parameters for encoder data sets, 1-739
      List of parameters for motor data sets, 1-741
      List of parameters for power unit data sets, 1-743
      Name, 1-14
      Not for motor type, 1-23
      Number, 1-13
      Number range, 1-26
      P group, 1-20
      Safety notices, 1-24
      Scaling, 1-23
      Short name, 1-14
      Unit, 1-20
      Unit group, 1-20
      Unit selection, 1-20
      Values, 1-24
   Password for access level 4, 1-17
   PDS, Power unit Data Set, 1-19, 2-950

PID controller (p0108.16 = 1), 2-933
   Position control, 2-880
   Power unit data sets, 2-950
   Process data, 2-776
   Product information, Preface-6
   PROFIdrive, 2-776
   pxxxx, 1-13

R
   Ramp-function generator, 2-853
   Reaction to faults, 3-967
   Resetting faults, 3-972
   rxxxx, 1-13

S
   Safety Integrated
      Basic Functions, 2-834
      Extended Functions, 2-834
      Safety notices (parameter), 1-24
      Scaling, 1-23
      Search tools for manual, Preface-7
      Sequence control, 2-826
   Servo control
      Control type changeover, 2-898
      Current setpoint filter, 2-908
      Encoder evaluation, 2-885
      Iq and Id controller, 2-909
      Kp_n-/Tn_n adaptation, 2-897
      Signaling function variable, 2-901
      Speed controller, 2-895
      Speed controller without encoder, 2-899
      Speed setpoint filter and pre-control, 2-893
      Table of contents, 2-892
      Torque setpoint, 2-898
      U/f control for diagnostics, 2-900
   Setpoint channel, 2-853
   Setpoint channel not activated, 2-862
   Signal path in function diagrams, 2-754
   Signaling function variable, 2-901
   Signals, 2-938
   Skip frequency bands, 2-853
   Speed control
      Servo, 2-892
   Speed signals, 2-938
   Status words
      Internal, 2-813
      Standard telegrams, 2-776
   STOP1, 3-968
   STOP2, 3-968
   Support, Preface-7
   Support Request, Preface-7
Index

T
T - Ready for operation, 1-16
Target group, Preface-6
Technical Support, Preface-7
Technology controller (p0108.16 = 1), 2-933
Technology functions, 2-912
Telegrams, 2-776
Terminals
  Control Unit 305 (CU305), 2-768
Thermal monitoring, 2-938
Torque signals, 2-938
Triggering when messages are issued (r2129), 2-944

U
U - Status Run, 1-16
U/f control
  Servo, 2-900
Unit (parameter), 1-20
Usage phases, Preface-6

V
Values (parameter), 1-24
Vector control
  Encoder evaluation, 2-885
Version
  List of all parameters, 1-29
  List of faults and alarms, 3-975
  List of parameters for command data sets, 1-733
  List of parameters for drive data sets, 1-735
  List of parameters for encoder data sets, 1-739
  List of parameters for motor data sets, 1-741
  List of parameters for power unit data sets, 1-743