SIEMENS

SINAMICS

SINAMICS G120
CU250S-2 Control Units

Compact Operating Instructions

Scan the QR code for additional information on SINAMICS G120.
Legal information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

⚠️ DANGER
indicates that death or severe personal injury **will** result if proper precautions are not taken.

⚠️ WARNING
indicates that death or severe personal injury **may** result if proper precautions are not taken.

⚠️ CAUTION
indicates that minor personal injury can result if proper precautions are not taken.

⚠️ NOTICE
indicates that property damage can result if proper precautions are not taken.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Proper use of Siemens products

Note the following:

⚠️ WARNING
Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

Trademarks

All names identified by © are registered trademarks of Siemens AG. The remaining trademarks in this publication may be trademarks whose use by third parties for their own purposes could violate the rights of the owner.

Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.
This manual describes how you install a SINAMICS G120 converter with CU250S-2 Control Unit and commission it.

What is the meaning of the symbols in the manual?

An operating instruction starts here.

This concludes the operating instruction.
1 Fundamental safety instructions

1.1 General safety instructions

⚠️ WARNING
Risk of death if the safety instructions and remaining risks are not carefully observed
If the safety instructions and residual risks are not observed in the associated hardware documentation, accidents involving severe injuries or death can occur.
- Observe the safety instructions given in the hardware documentation.
- Consider the residual risks for the risk evaluation.

⚠️ WARNING
Danger to life or malfunctions of the machine as a result of incorrect or changed parameterization
As a result of incorrect or changed parameterization, machines can malfunction, which in turn can lead to injuries or death.
- Protect the parameterization (parameter assignments) against unauthorized access.
- Respond to possible malfunctions by applying suitable measures (e.g. EMERGENCY STOP or EMERGENCY OFF).
1.2 Industrial security

Note

Industrial security

Siemens provides products and solutions with industrial security functions that support the secure operation of plants, solutions, machines, equipment and/or networks. They are important components in a holistic industrial security concept. With this in mind, Siemens’ products and solutions undergo continuous development. Siemens recommends strongly that you regularly check for product updates.

For the secure operation of Siemens products and solutions, it is necessary to take suitable preventive action (e.g. cell protection concept) and integrate each component into a holistic, state-of-the-art industrial security concept. Third-party products that may be in use should also be considered. For more information about industrial security, visit Hotspot-Text (http://www.siemens.com/industrialsecurity).

To stay informed about product updates as they occur, sign up for a product-specific newsletter. For more information, visit Hotspot-Text (http://support.automation.siemens.com).

⚠️ WARNING

Danger as a result of unsafe operating states resulting from software manipulation

Software manipulation (e.g. by viruses, Trojan horses, malware, worms) can cause unsafe operating states to develop in your installation which can result in death, severe injuries and/or material damage.

- Keep the software up to date.
  You will find relevant information and newsletters at this address (http://support.automation.siemens.com).
- Incorporate the automation and drive components into a holistic, state-of-the-art industrial security concept for the installation or machine.
  You will find further information at this address (http://www.siemens.com/industrialsecurity).
- Make sure that you include all installed products into the holistic industrial security concept.
2

Scope of delivery

The delivery comprises at least the following components:

- A CU250S-2 Control Unit ready for operation with installed firmware.


  The fieldbus interface of the Control Unit depends on the order number. The order number, the designation and the version of the hardware (e.g. 02) and firmware (e.g. 4.6) can be found on the rating plate of the Control Unit.

<table>
<thead>
<tr>
<th>Designation</th>
<th>Order number</th>
<th>Fieldbus</th>
</tr>
</thead>
<tbody>
<tr>
<td>CU250S-2</td>
<td>6SL3246-0BA22-1BA0</td>
<td>USS, Modbus RTU</td>
</tr>
<tr>
<td>CU250S-2 DP</td>
<td>6SL3246-0BA22-1PA0</td>
<td>PROFIBUS</td>
</tr>
<tr>
<td>CU250S-2 PN</td>
<td>6SL3246-0BA22-1FA0</td>
<td>PROFINET, EtherNet/IP</td>
</tr>
<tr>
<td>CU250S-2 CAN</td>
<td>6SL3246-0BA22-1CA0</td>
<td>CANopen</td>
</tr>
</tbody>
</table>

- Compact Operating Instructions in German and English
- The inverter contains open-source software (OSS). The OSS license terms are saved in the inverter.

Transferring license terms of the OSS code to a PC

Procedure

To transfer the OSS license terms from the inverter to a PC, proceed as follows:

1. Switch off the inverter power supply.
2. Insert an empty memory card into the card slot of the inverter. Also see Section: Overview of the interfaces (Page 8)
3. Switch on the inverter power supply.
4. When you have switched on the power supply, wait 30 seconds. During this time, the inverter writes the "Read_OSS.ZIP" file onto the memory card.
5. Switch off the inverter power supply.
6. Remove the card from the inverter.
7. Use a card reader and load the file to a PC.

You have then transferred the OSS license terms from the inverter to a PC.
Installing

3

3.1 Snapping the Control Unit onto the Power Module

Installing the Control Unit on an IP20 Power Module

Procedure

Proceed as follows to connect Power Modules and Control Units:

1. Locate the lugs at the rear of the Control Unit in the matching recesses of the Power Module.
2. Mount the Control Unit onto the Power Module so that it audibly snaps into place.

The Power Module and the Control Unit are now connected with one another.

To remove the Control Unit, press on the release button on the Power Module and withdraw the Control Unit.

Permissible Power Modules

You may operate the Control Unit with the following Power Modules:

- PM240
- PM240-2
- PM250
- PM260
- PM340 1AC
3.2 Overview of the interfaces

To access the interfaces at the front of the Control Unit, you must unplug the Operator Panel (if one is being used) and open the front doors.

1. Terminal strips
2. Fieldbus interface
   Selecting the fieldbus address:
   - PROFIBUS
   - USS
   - Modbus RTU
   - CanOpen
3. Status LED
   - RDY
   - BF
   - SAFE
   - LNK1, only for PROFINET
   - LNK2, only for PROFINET
4. USB interface for connection to a PC
5. No function. Keep the switch in the "Vector" position.
6. Switch for analog inputs
   - I: 0/4 mA … 20 mA
   - U: -10/0 V … 10 V
7. Connection to the operator panel
8. Memory card slot
3.2 Overview of the interfaces

Interfaces at the lower side of the Control Unit

Table 3-1 Permissible encoders on the DRIVE-CLiQ interface X100

<table>
<thead>
<tr>
<th>DRIVELIQ encoder</th>
<th>Resolver</th>
<th>HTL</th>
<th>TTL</th>
<th>SSI encoder</th>
<th>Endat 2.1</th>
<th>sin/cos encoder</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct connection</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Connection via Sensor Module</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

The permissible combinations of encoders for speed control and position control are listed in the “Basic Positioner” Function Manual, see also: Manuals for the Control Unit (http://support.automation.siemens.com/WW/view/en/30563628/133300).
3.3 Terminal blocks

Terminal strips behind the upper front door

Optional external supply 20.4 V ... 28.8 V
Reference for terminal 31

Switchable digital inputs of outputs, switchable via p0728

Reference for terminals 1, 9, 12, 26, 33, 51 ... 54
Analog outputs (0 V ... 10 V, 0 mA ... 20 mA)

Internal supply, max. 10 mA
Analog input (-10 V ... 10 V, 0/4 mA ... 20 mA)

Reference for terminals 1, 9, 12, 26, 33, 51 ... 54
Analog input (-10 V ... 10 V, 0/4 mA ... 20 mA)

Reference for terminals 1, 9, 12, 26, 33, 51 ... 54
Temperature sensor (PTC, KTY84, bimetal)

Different reference potentials:
The terminals labelled “GND” are connected internally.
“GND” and “GND IN” are not connected internally.

Figure 3-1 Interconnection example of the digital inputs with external 24 V power supply

Interconnecting the analog inputs (terminals 3, 4 and 10, 11)

For the analog inputs, you may use the internal 10 V supply (example: terminals 1 ... 4, 13)
or an external supply (example: terminals 10, 11).

If you use the internal 10 V supply, you must connect AI 0- or AI 1- to GND.
Optional 24 V supply (terminals 31, 32)

Connection of the optional 24 V supply has the following advantages:

- The Control Unit remains in operation after disconnection of the Power Module from the line supply. The Control Unit thus maintains the fieldbus communication, for example.
- You can use terminals 51 ... 54 as digital outputs.

Use a power supply that provides an output voltage in accordance with SELV (Safety Extra Low Voltage) or PELV (Protective Extra Low Voltage).

If you use a common external power supply for terminals 31, 32 and the digital inputs, you must connect GND to GND IN.

Terminal strips behind the lower front door

Different reference potentials:
The reference potentials of the digital inputs are not connected internally to each other or to GND.

Figure 3-2 Interconnection example of the digital inputs with external 24 V power supplies

Interconnecting the reference potential of the digital inputs

<table>
<thead>
<tr>
<th>Supply</th>
<th>Reference potential interconnection</th>
</tr>
</thead>
<tbody>
<tr>
<td>You are using an external 24 V supply</td>
<td>Connect the reference potential of the external 24 V supply to the reference potential of the appropriate digital input.</td>
</tr>
<tr>
<td>You are using the internal 24 V supply at terminal 9</td>
<td>Connect the appropriate reference potential of the digital input to GND.</td>
</tr>
</tbody>
</table>
Factory setting of the terminal strips

The factory setting of the terminals depends on the Control Unit.

Control Units with USS or CANopen interface

The fieldbus interface is not active.

Figure 3-3 Factory setting of the CU250S-2 and CU250S-2 CAN Control Units
### Control Units with PROFIBUS or PROFINET interface

The function of the fieldbus interface depends on DI 3.

#### Figure 3-4 Factory setting of the CU250S-2 DP and CU250S-2 PN Control Units

Fieldbus interface is active and configured for PROFIdrive telegram 1

Fieldbus interface is not active
3.4 Operator panels

Changing the function of the terminals

The function of the terminals marked in color in the two figures above, can be set.

In order that you do not have to successively change terminal for terminal, several terminals can be jointly set using default settings ("p0015 Macro drive unit").

The factory settings of the terminals for USS/CANopen and PROFIBUS/PROFINET described above correspond to the following default settings:

- p0015 = 12 (setting in STARTER: "Standard I/O with analog setpoint")
- p0015 = 7 (setting in STARTER: "Fieldbus with data set switchover")

Further default settings can be found in the Operating Instructions, see also: Manuals for the Control Unit (http://support.automation.siemens.com/WW/view/en/30563628/133300).

Wiring the terminal strip in compliance with EMC

1. If you use shielded cables, then you must connect the shield to the mounting plate of the control cabinet or with the shield support of the inverter through a good electrical connection and a large surface area.
   See also: EMC installation guideline (http://support.automation.siemens.com/WW/view/en/60612658)

2. Use the shield connection plate (order number 6SL3264-1EA00-0LA0) of the Control Unit as strain relief.

3.4 Operator panels

The Intelligent Operator Panel (IOP) is available for snapping on to the Control Unit or as handheld with a connection cable to the Control Unit. The graphics-capable plain text display of the IOP enables intuitive operation and diagnostics of the inverter.

See also: Compatibility of the IOP and Control Units (http://support.automation.siemens.com/WW/view/en/67273266)

The BOP-2 is an operator panel for snapping on to the Control Unit. The BOP-2 has a two-line display for operation and diagnostics of the inverter.

Further information can be found in the Operating Instructions of the BOP-2 and the IOP: Operator Panels (http://support.automation.siemens.com/WW/view/en/30563514/133300).
4

Commissioning

Requirements for commissioning

Use one of the PC tools STARTER or Startdrive to commission the inverter. You can access the inverter with STARTER or Startdrive either via a USB connection or via the fieldbus.

System requirements and download:


Help for the operation and for the functions of the commissioning tools:


Commissioning with STARTER is described in the following.

4.1 Commissioning with STARTER

Creating a STARTER project

Procedure

1. In the STARTER menu, select "Project" → "New".
2. Specify a name of your choice for the project.

You have created a new STARTER project.
Transferring inverters connected via USB to the project

Procedure

Proceed as follows to transfer an inverter connected via USB to your project:

1. Switch on the inverter power supply.
2. First insert a USB cable into your PC and then into the inverter.
3. The PC operating system installs the USB driver when you are connecting the inverter and PC together for the first time.
   - Windows 7 installs the driver automatically.
   - For Windows XP you must acknowledge several system messages.
4. Start the STARTER commissioning software.
5. In STARTER, press the ☑️("Accessible nodes") button.

6. When the USB interface is appropriately set, then the "Accessible nodes" screen form shows the inverters that can be accessed.

If you have not correctly set the USB interface, then the following "No additional nodes found" message is displayed. In this case, follow the description below.

7. Select the inverter ☑️.
8. Press the "Accept" button.

You have transferred an inverter accessible via the USB interface into your project.
Setting the USB interface

Procedure

Proceed as follows to set the USB interface in STARTER:

1. In this case set the “Access point” to “DEVICE (STARTER, Scout)” and the “PG/PC interface” to “S7USB”.
2. Press the “Update” button.

You have set the USB interface.
STARTER now shows the inverters connected via USB.

Starting the configuration

Procedure

To start the configuration, proceed as follows:

1. In STARTER select the drive you wish to commission.
2. Start the wizard for the device configuration:

You have started the configuration.
Performing the configuration

Follow the steps of the configuration wizard and enter the data of your application.

Loading the configured data into the drive

Procedure

1. Select your project and go online:

2. STARTER compares your configuration with the real inverter. STARTER signals any differences in the "Online/offline comparison".

   Acknowledge the message by pressing the "Load HW configuration to PG" button.

3. Open "Drive Navigator".

4. Select the "Commissioning" button.

5. Click on "Load data to the drive".

6. In the screen form, select "After loading copy RAM to ROM".

7. Load your configuration into the inverter.

8. Close the "Commissioning" screen form.

   You have loaded your configuration into the drive and therefore performed the basic commissioning.

Identifying motor data

Requirements

- In the basic commissioning, you have selected the motor identification (MOT ID). In this case, after the basic commissioning has been completed, the inverter issues the alarm A07991.

- The motor has cooled down to the ambient temperature.

   If the motor is too hot, the motor data identification will provide incorrect values and the vector control will become unstable.
Commissioning

4.1 Commissioning with STARTER

DANGER
Risk of injury or material damage as a result of machine movements when switching on the motor
Switching on the motor for identification purposes may result in hazardous machine movements.
Secure dangerous machine parts before starting motor data identification:
- Before switching on, check that no parts are loose on the machine or can be spun out.
- Before switching on, ensure that nobody is working on the machine or located within its working area.
- Secure the machine’s work area against unintended access.
- Lower hanging/suspended loads to the floor.

Procedure
To initiate motor data identification and optimization of the motor control, proceed as follows:
1. Open by double-clicking on the control panel in STARTER.
2. Assume master control for the inverter.
3. Set the "Enable signals"
4. Switch on the motor.
   The inverter starts the motor data identification. This measurement can take several minutes. After the measurement, the inverter switches off the motor.
5. Relinquish the master control after the motor data identification.
6. Click the Save (RAM to ROM) button.

You have now completed motor data identification.

Self-optimization of the closed-loop control
If you have also selected a rotating measurement with self-optimization of the vector control in addition to the motor data identification, then you must switch on the motor again as described above and wait for the optimization run to be completed.
4.2 Connecting the inverter to the fieldbus

Where can I find instructions for the fieldbus connection of the inverter?

You can find instructions for the fieldbus connection on the Internet:

- Operating Instructions, "Inverter with CU250S-2 Control Units": Manuals for the Control Unit (http://support.automation.siemens.com/WW/view/en/30563628/133300)

Example telegram

<table>
<thead>
<tr>
<th>Telegram 1</th>
<th>Abbreviation</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>STW1</td>
<td>Control word 1</td>
<td></td>
</tr>
<tr>
<td>ZSW1</td>
<td>Status word 1</td>
<td></td>
</tr>
<tr>
<td>PZD01/02</td>
<td>Process data 16-bit</td>
<td></td>
</tr>
<tr>
<td>NSOLL_A</td>
<td>Speed setpoint 16-bit</td>
<td></td>
</tr>
<tr>
<td>NIST_A</td>
<td>Actual speed value 16-bit</td>
<td></td>
</tr>
</tbody>
</table>

The inverter telegrams without configured basic positioner are described in the Operating Instructions and in the "Communications" Function Manual: Manuals for the Control Unit (http://support.automation.siemens.com/WW/view/en/30563628/133300)

The telegrams with configured basic positioner are described in the "Basic Positioner and Technology" Function Manual: Manuals for the Control Unit (http://support.automation.siemens.com/WW/view/en/30563628/133300).

Control word 1 (STW1)

<table>
<thead>
<tr>
<th>Bit</th>
<th>Meaning</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0 = OFF1</td>
<td>The motor brakes with the ramp-down time p1121 of the ramp-function generator. The inverter switches off the motor at standstill.</td>
</tr>
<tr>
<td></td>
<td>0 → 1 = ON</td>
<td>The inverter goes into the &quot;ready&quot; state. If, in addition bit 3 = 1, then the inverter switches on the motor.</td>
</tr>
<tr>
<td>1</td>
<td>0 = OFF2</td>
<td>Switch off the motor immediately, the motor then coasts down to a standstill.</td>
</tr>
<tr>
<td></td>
<td>1 = No OFF2</td>
<td>The motor can be switched on (ON command).</td>
</tr>
<tr>
<td>2</td>
<td>0 = Quick stop (OFF3)</td>
<td>Quick stop: The motor brakes with the OFF3 ramp-down time p1135 down to standstill.</td>
</tr>
<tr>
<td></td>
<td>1 = No quick stop (OFF3)</td>
<td>The motor can be switched on (ON command).</td>
</tr>
<tr>
<td>3</td>
<td>0 = Inhibit operation</td>
<td>Switch off the motor immediately, the motor then coasts down to a standstill.</td>
</tr>
<tr>
<td></td>
<td>1 = Enable operation</td>
<td>The motor can be switched on (ON command).</td>
</tr>
<tr>
<td>4</td>
<td>0 = Disable RFG</td>
<td>The inverter immediately sets its ramp-function generator output to 0.</td>
</tr>
<tr>
<td></td>
<td>1 = Do not disable RFG</td>
<td>The ramp-function generator can be enabled.</td>
</tr>
</tbody>
</table>
### 4.2 Connecting the inverter to the fieldbus

#### Bit 5
- **0 = Stop RFG**
  - The output of the ramp-function generator stops at the actual value.
- **1 = Enable RFG**
  - The output of the ramp-function generator follows the setpoint.

#### Bit 6
- **0 = Inhibit setpoint**
  - The inverter brakes the motor with the ramp-down time p1121 of the ramp-function generator.
- **1 = Enable setpoint**
  - Motor accelerates with the ramp-up time p1120 to the setpoint.

#### Bit 7
- **0 → 1 = Acknowledge faults**
  - Acknowledge fault. If the ON command is still active, the inverter switches to "closing lockout" state.

#### Bit 8, 9
- **Reserved**

#### Bit 10
- **0 = No control via PLC**
  - The inverter ignores the process data from the fieldbus.
- **1 = Control via PLC**
  - Control via fieldbus, the inverter accepts the process data from the fieldbus.

#### Bit 11
- **1 = Direction reversal**
  - Invert setpoint in the inverter.

#### Bit 12
- **Not used**

#### Bit 13
- **1 = MOP up**
  - Increase the setpoint saved in the motorized potentiometer.

#### Bit 14
- **1 = MOP down**
  - Reduce the setpoint saved in the motorized potentiometer.

#### Bit 15
- **Reserved**
  - Changes over between settings for different operation interfaces (command data sets).

### Status word 1 (ZSW1)

<table>
<thead>
<tr>
<th>Bit</th>
<th>Meaning</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1 = Ready to start</td>
<td>Power supply switched on; electronics initialized; pulses locked.</td>
</tr>
<tr>
<td>1</td>
<td>1 = Ready</td>
<td>Motor is switched on (ON/OFF1 = 1), no fault is active. With the command &quot;Enable operation&quot; (STW1.3), the inverter switches on the motor.</td>
</tr>
<tr>
<td>2</td>
<td>1 = Operation enabled</td>
<td>Motor follows setpoint. See control word 1, bit 3.</td>
</tr>
<tr>
<td>3</td>
<td>1 = Fault active</td>
<td>The inverter has a fault. Acknowledge fault using STW1.7.</td>
</tr>
<tr>
<td>4</td>
<td>1 = OFF2 inactive</td>
<td>Coast down to standstill is not active.</td>
</tr>
<tr>
<td>5</td>
<td>1 = OFF3 inactive</td>
<td>Quick stop is not active.</td>
</tr>
<tr>
<td>6</td>
<td>1 = Closing lockout active</td>
<td>It is only possible to switch on the motor after an OFF1 followed by ON.</td>
</tr>
<tr>
<td>7</td>
<td>1 = Alarm active</td>
<td>Motor remains switched on; no acknowledgement is necessary.</td>
</tr>
<tr>
<td>8</td>
<td>1 = Speed deviation within the tolerance range</td>
<td>Setpoint / actual value deviation within the tolerance range.</td>
</tr>
<tr>
<td>9</td>
<td>1 = Master control requested</td>
<td>The automation system is requested to accept the inverter control.</td>
</tr>
<tr>
<td>10</td>
<td>1 = Comparison speed reached or exceeded</td>
<td>Speed is greater than or equal to the corresponding maximum speed.</td>
</tr>
<tr>
<td>11</td>
<td>1 = Torque limit reached</td>
<td>Comparison value for current or torque has been reached or exceeded.</td>
</tr>
<tr>
<td>12</td>
<td>1 = Holding brake open</td>
<td>Signal to open and close a motor holding brake.</td>
</tr>
<tr>
<td>13</td>
<td>0 = Alarm, motor overtemperature</td>
<td>--</td>
</tr>
<tr>
<td>14</td>
<td>1 = Motor rotates clockwise</td>
<td>Internal inverter actual value &gt; 0</td>
</tr>
<tr>
<td></td>
<td>0 = Motor rotates counterclockwise</td>
<td>Internal inverter actual value &lt; 0</td>
</tr>
<tr>
<td>15</td>
<td>0 = Alarm, inverter thermal overload</td>
<td></td>
</tr>
</tbody>
</table>
4.3 Frequently required parameters

### Description files for fieldbuses

The description files are electronic device data sheets which contain all the required information of a higher-level controller. You can configure and operate the inverter on a fieldbus with the appropriate description file.

<table>
<thead>
<tr>
<th>Description file</th>
<th>Download</th>
<th>Alternative to download</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generic Station Description (GSD) for PROFIBUS</td>
<td>Internet: <a href="http://support.automation.siemens.com/WW/view/en/23450835">http://support.automation.siemens.com/WW/view/en/23450835</a></td>
<td>GSD and GSDML are saved in the inverter. The inverter writes its GSD or GSDML to the memory card once you insert this card in the inverter and set p0804 to 12. You can then transfer the file to your programming device or PC using the memory card.</td>
</tr>
<tr>
<td>Electronic Data Sheet (EDS) for CANopen</td>
<td>Internet: <a href="http://support.automation.siemens.com/WW/view/en/48351511">http://support.automation.siemens.com/WW/view/en/48351511</a></td>
<td>Further information can be found in the operating instructions</td>
</tr>
<tr>
<td>EDS for Ethernet/IP</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>

### 4.3 Frequently required parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>p0015</td>
<td>Macro drive unit  Set defaults for inputs and outputs via a macro Terminal blocks (Page 10).</td>
</tr>
<tr>
<td>r0018</td>
<td>Control Unit firmware version</td>
</tr>
<tr>
<td>p0100</td>
<td>IEC/NEMA mot stds  0: Europe 50 [Hz]  1: NEMA motor (60 Hz, US units)  2: NEMA motor (60 Hz, SI units)</td>
</tr>
<tr>
<td>p0304</td>
<td>Rated motor voltage [V]</td>
</tr>
<tr>
<td>p0305</td>
<td>Rated motor current [A]</td>
</tr>
<tr>
<td>p0307</td>
<td>Rated motor power [kW] or [hp]</td>
</tr>
<tr>
<td>p0310</td>
<td>Rated motor frequency [Hz]</td>
</tr>
<tr>
<td>p0311</td>
<td>Rated motor speed [rpm]</td>
</tr>
<tr>
<td>p0601</td>
<td>Motor temperature sensor type  Terminal 14  T1 motor (+)  0: No sensor (factory setting)  1: PTC (→ p0604)  2: KTY84 (→ P0604)  4: Bimetal  Terminal 15  T2 motor (-)</td>
</tr>
<tr>
<td>p0625</td>
<td>Motor ambient temperature during commissioning [° C]</td>
</tr>
<tr>
<td>p0640</td>
<td>Current limit [A]</td>
</tr>
</tbody>
</table>
### 4.3 Frequently required parameters

**CU250S-2 Control Units**

#### Digital inputs status

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>r0722</td>
<td>Digital inputs status</td>
</tr>
<tr>
<td>.0</td>
<td>Terminal 5</td>
</tr>
<tr>
<td>.1</td>
<td>Terminal 6, 64</td>
</tr>
<tr>
<td>.2</td>
<td>Terminal 7</td>
</tr>
<tr>
<td>.3</td>
<td>Terminal 8, 65</td>
</tr>
<tr>
<td>.4</td>
<td>Terminal 16</td>
</tr>
<tr>
<td>.5</td>
<td>Terminal 17, 66</td>
</tr>
<tr>
<td>.6</td>
<td>Terminal 67</td>
</tr>
<tr>
<td>.11</td>
<td>Terminal 3, 4</td>
</tr>
<tr>
<td>.12</td>
<td>Terminal 10, 11</td>
</tr>
<tr>
<td>.16</td>
<td>Terminal 41</td>
</tr>
<tr>
<td>.17</td>
<td>Terminal 42</td>
</tr>
<tr>
<td>.18</td>
<td>Terminal 43</td>
</tr>
<tr>
<td>.19</td>
<td>Terminal 44</td>
</tr>
<tr>
<td>.24</td>
<td>Terminal 51</td>
</tr>
<tr>
<td>.25</td>
<td>Terminal 52</td>
</tr>
<tr>
<td>.26</td>
<td>Terminal 53</td>
</tr>
<tr>
<td>.27</td>
<td>Terminal 54</td>
</tr>
</tbody>
</table>

Selection of the possible settings:
- p0840 ON/OFF (OFF1)
- p0844 No coast-down (OFF2)
- p0848 No quick stop (OFF3)
- p0855 Unconditionally release holding brake
- p1020 Fixed speed setpoint selection Bit 0
- p1021 Fixed speed setpoint selection Bit 1
- p1022 Fixed speed setpoint selection Bit 2
- p1023 Fixed speed setpoint selection Bit 3
- p1036 Motorized potentiometer setpoint raise
- p2103 Acknowledge faults
- p1055 Jog bit 0
- p1056 Jog bit 1
- p1110 Inhibit negative direction
- p1111 Inhibit positive direction
- p113 Setpoint inversion
- p1122 Bypass ramp-function generator
- p1140 Enable ramp-function generator / inhibit ramp-function generator
- p1141 Continue ramp-function generator / freeze ramp-function generator
- p1142 Enable setpoint / inhibit setpoint
- p1230 DC braking activation
- p2103 Acknowledge faults
- p2106 External fault 1
- p2112 External alarm 1
- p2200 Technology controller enable

**Signal source for terminal DO 0**
- Terminals 19, 20 (NO contact)
- Terminals 18, 20 (NC contact)

Selection of the possible settings:
- 52.0 Ready for switching on
- 52.1 Ready for operation
- 52.2 Operation enabled
- 52.3 Fault present
- 52.4 Coast down active (OFF2)
- 52.5 Quick stop active (OFF3)
- 52.14 Motor rotates forwards

**Signal source for terminal DO 1**
- Terminals 21, 22 (NO contact)

**Signal source for terminal DO 2**
- Terminals 24, 25 (NO contact)
- Terminals 23, 25 (NC contact)

### Analog inputs actual value [%]

| [0] | AI 0 |
| [1] | AI 1 |
### 4.3 Frequently required parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>p0756</td>
<td><strong>Analog input type</strong>&lt;br&gt;0: Unipolar voltage input (0 V ... +10 V)&lt;br&gt;1: Unipolar voltage input monitored (+2 V ... +10 V)&lt;br&gt;2: Unipolar current input (0 mA ... +20 mA)&lt;br&gt;3: Unipolar current input monitored (+4 mA ... +20 mA)&lt;br&gt;4: Bipolar voltage input (-10 V ... +10 V)&lt;br&gt;&lt;br&gt;<strong>Terminals</strong>&lt;br&gt;0: Terminals 3, 4 AI 0&lt;br&gt;1: Terminals 10, 11 AI 1</td>
</tr>
<tr>
<td>p0771</td>
<td><strong>Analog outputs signal source</strong>&lt;br&gt;Selection of the possible settings:&lt;br&gt;0: Analog output locked&lt;br&gt;21: Actual speed value&lt;br&gt;24: Output frequency smoothed&lt;br&gt;25: Output voltage smoothed&lt;br&gt;26: DC-link voltage smoothed&lt;br&gt;27: Actual current value (smoothed absolute value)&lt;br&gt;&lt;br&gt;<strong>Terminals</strong>&lt;br&gt;0: Terminals 12, 13 AO 0&lt;br&gt;1: Terminals 26, 27 AO 1</td>
</tr>
<tr>
<td>p1001</td>
<td>Fixed speed setpoint 1</td>
</tr>
<tr>
<td>p1002</td>
<td>Fixed speed setpoint 2</td>
</tr>
<tr>
<td>p1003</td>
<td>Fixed speed setpoint 3</td>
</tr>
<tr>
<td>p1004</td>
<td>Fixed speed setpoint 4</td>
</tr>
<tr>
<td>p1058</td>
<td>Jog 1 speed setpoint</td>
</tr>
<tr>
<td>p1059</td>
<td>Jog 2 speed setpoint</td>
</tr>
<tr>
<td>p1070</td>
<td><strong>Main setpoint</strong>&lt;br&gt;Selection of the possible settings:&lt;br&gt;0: Main setpoint = 0&lt;br&gt;755[0]: Value of analog input 0&lt;br&gt;1024: Fixed setpoint&lt;br&gt;1050: Motorized potentiometer&lt;br&gt;2050[1]: PZD 2 from the fieldbus</td>
</tr>
<tr>
<td>p1080</td>
<td>Minimum speed [rpm]</td>
</tr>
<tr>
<td>p1082</td>
<td>Maximum speed [rpm]</td>
</tr>
<tr>
<td>p1120</td>
<td>Ramp-function generator ramp-up time [s]</td>
</tr>
<tr>
<td>p1121</td>
<td>Ramp-function generator ramp-down time [s]</td>
</tr>
<tr>
<td>p1300</td>
<td><strong>Open-loop/closed-loop control operating mode</strong>&lt;br&gt;Selection of the possible settings:&lt;br&gt;0: U/f control with linear characteristic&lt;br&gt;1: U/f control with linear characteristic and FCC&lt;br&gt;2: U/f control with parabolic characteristic&lt;br&gt;20: Speed control (without encoder)&lt;br&gt;21: Closed-loop speed control (with encoder)&lt;br&gt;22: Torque control (without encoder)&lt;br&gt;23: Torque control (with encoder)</td>
</tr>
<tr>
<td>p1310</td>
<td>Starting (voltage boost) permanent</td>
</tr>
<tr>
<td>p1800</td>
<td>Pulse frequency setpoint</td>
</tr>
<tr>
<td>p2030</td>
<td><strong>Fieldbus interface protocol selection</strong>&lt;br&gt;Selection of the possible settings:&lt;br&gt;0: No protocol&lt;br&gt;3: PROFIBUS&lt;br&gt;7: PROFINET</td>
</tr>
</tbody>
</table>
## 5.1 Manuals for your inverter

**Documentation on DVD**

SINAMICS Manual Collection, order number 6SL3097-4CA00-0YG0

<table>
<thead>
<tr>
<th>Information depth</th>
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<tr>
<td>+++</td>
<td>Function Manual, Basic Positioner</td>
<td>Commissioning the basic positioner.</td>
<td>English, German, Chinese</td>
<td></td>
</tr>
<tr>
<td>+++</td>
<td>Fieldbus Function Manual for the SINAMICS G110M, G120, G120C and G120D inverters</td>
<td>Configuring fieldbusses.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>+++</td>
<td>List Manual for the CU250S-2 Control Unit</td>
<td>List of all parameters, alarms and faults of the inverter. Graphic function diagrams.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>+++</td>
<td>Hardware Installation Manual for the following SINAMICS G120 Power Modules: PM240, PM240-2, PM250, PM260</td>
<td>Installing Power Modules, reactors and filters. Technical data Maintenance</td>
<td>English, German</td>
<td></td>
</tr>
</tbody>
</table>
5.2 Product support

<table>
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<tr>
<th>Information depth</th>
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</tr>
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</table>
| +++               | Operating Instructions for the following Operator Panels:  
• BOP-2  
• IOP | Operating operator panels, installing door assembly kit for IOP. | English, German | | |
| +++               | Configuration Manual  
EMC installation guideline | EMC-compliant control cabinet design, potential equalization and cable routing | English, German, Italian, French, Spanish, Chinese | EMC installation guideline (http://support.automation.siemens.com/WW/view/en/60612658) |
PM340 Power Module | Installing the PM340 Power Module.  
Technical data  
| +++               | SINAMICS S120 Control Units and Additional System Components | Including: SMC and SME Sensor Modules | English, German, Italian, French, Spanish, Chinese, Russian | S120 system components (http://support.automation.siemens.com/WW/view/en/68040800) |

5.2 Product support

Table 5-2 Technical support

<table>
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<tr>
<th>France</th>
<th>Germany</th>
<th>Italy</th>
<th>Spain</th>
<th>Great Britain</th>
</tr>
</thead>
<tbody>
<tr>
<td>+33 (0) 821 801 122</td>
<td>+49 (0)911 895 7222</td>
<td>+39 (02) 24362000</td>
<td>+34 902 237 238</td>
<td>+44 161 446 5545</td>
</tr>
</tbody>
</table>

Other service telephone numbers: Product support (http://www.siemens.com/automation/service&support)