List of System Variables

Parameter Manual

Valid for

Control
SINUMERIK 840D sl/840DE sl
SINUMERIK 840Di sl/840DiE sl

<table>
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<tr>
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<th>Version</th>
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</tr>
<tr>
<td>system software for 840Di sl/840DiE sl</td>
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SINUMERIK® Documentation

Printing history

Brief details of this edition and previous editions are listed below.
The status of each edition is shown by the code in the "Remarks" column.
Status codes in the "Remarks" column.
   A .... New documentation.
   B .... Unrevised reprint with new Order No.
   C .... Revised edition with new status.

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<td>01/2008</td>
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Liability disclaimer

We have checked that the contents of this document correspond to the hardware and software described. Nonetheless, differences might exist and therefore we cannot guarantee that they are completely identical. The information contained in this document is, however, reviewed regularly and any necessary changes will be included in the next edition.
Preface

Structure of the documentation

The SINUMERIK documentation is organized in 3 parts:

² General documentation
² User documentation
² Manufacturer/service documentation

An overview of publications (updated monthly) indicating the language versions available can be found on the Internet at:

http://www.siemens.com/motioncontrol

Select "Support" -> "Technical Documentation" -> "Overview of Publications"

The Internet version of the DOConCD (DOConWEB) is available at:

http://www.automation.siemens.com/doconweb

Information about training courses and FAQs (Frequently Asked Questions) can be found at the following web site:

http://www.siemens.com/motioncontrol under menu option "Support"

Target group

This documentation is intended for project engineers, commissioning engineers, machine operators, service and maintenance personnel.

Benefits

The Parameter Manual enables the intended target group to evaluate error and fault indications and to respond accordingly.

With the help of the Parameter Manual, the target group has an overview of the various diagnostic options and diagnostic tools.

Standard version

This Parameter Manual only describes the functionality of the standard version. Extensions or changes made by the machine tool manufacturer are documented by the machine tool manufacturer.

Other functions not described in this documentation might be executable in the control. This does not, however, represent an obligation to supply such functions with a new control or when servicing.
Further, for the sake of simplicity, this documentation does not contain all detailed information about all types of the product and cannot cover every conceivable case of installation, operation or maintenance.

Technical Support

If you have any questions, please get in touch with our Hotline:

<table>
<thead>
<tr>
<th></th>
<th>Europa / Africa</th>
</tr>
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<tbody>
<tr>
<td>Phone</td>
<td>+49 180 5050 - 222</td>
</tr>
<tr>
<td>Fax</td>
<td>+49 180 5050 - 223</td>
</tr>
<tr>
<td>Internet</td>
<td><a href="http://www.siemens.de/automation/support-request">http://www.siemens.de/automation/support-request</a></td>
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<tr>
<td>Phone</td>
<td>+1 423 262 2522</td>
</tr>
<tr>
<td>Fax</td>
<td>+1 423 262 2200</td>
</tr>
<tr>
<td>E-mail</td>
<td><a href="mailto:techsupport.sea@siemens.com">mailto:techsupport.sea@siemens.com</a></td>
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<table>
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<tr>
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<td>+86 1064 747 474</td>
</tr>
<tr>
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<td><a href="mailto:adsupport.asia@siemens.com">mailto:adsupport.asia@siemens.com</a></td>
</tr>
</tbody>
</table>

Note
Country telephone numbers for technical support are provided under the following Internet address:
[http://www.siemens.com/automation/service&support](http://www.siemens.com/automation/service&support)
Calls are chargeable, e.g. 0,14 €/min. from the German telephone network. Other phone companies may offer different rates.

SINUMERIK Internet address
Objective

The Parameter Manual is intended for programmers. This manual uses the same data source as the relevant software version. A new List of System Variables manual is delivered with the new software versions.

Safety Instructions

This Manual contains information which you should carefully observe to ensure your own personal safety and the prevention of material damage. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring to property damage only have no safety alert symbol. The warnings appear in decreasing order of risk as given below.

Danger
Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury or in substantial property damage.

Warning
Indicates that death or severe personal injury will result if proper precautions are not taken.

Caution
with a warning triangle indicates that minor personal injury can result if proper precautions are not taken.

Caution
without a warning triangle indicates that property damage can result if proper precautions are not taken.

Notice
indicates a potential situation which, if not avoided, may result in an undesirable event or state.

If several hazards of different degrees occur, the hazard with the highest degree must always be given priority. A warning notice accompanied by a safety alert symbol indicating a risk of bodily injury can also indicate a risk of property damage.
Qualified Personnel

The associated device/system may only be set up and operated using this documentation. Commissioning and operation of a device/system may only be performed by qualified personnel. Qualified persons are defined as persons who are authorized to commission, to ground, and to tag circuits, equipment, and systems in accordance with established safety practices and standards.
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System variable

1.1 List of system variables

Properties of system variables

You will find the information below in the table entries of the system variables:

1st line: Data type, identifier, in some cases with index 1, index 2, short name (may not be defined as yet), reference to literature

2nd line: Description

3rd line: Description of field limits [index 1, index 2]

4th line: Axes, NCK version number for introduction of system variables

5th line: Unit, minimum value, maximum value

6th line: Headings of properties with the entries listed below:
- Preprocessing: Update is performed during preprocessing
- Main run: Update is performed during main run
- PreProc stop: Preprocessing stop
- MR sync: Main run synchronization
- PP: Use in part program possible
- SA: Use in synchronized actions possible
- OPI: Access possible via operator panel interface
- OEM: Access possible from OEM compile cycles
- Level: Access level required for writing system variables

7th line: read: read properties; possible if X is set

8th line: write: write properties; possible if X is set

9th line: Headings of properties with the entries listed below:
- Attributes
- Global (refers to all channels)
- Block search
- Link

10th line: Values of attributes
1.1.1 Arrangement of system variable information

<table>
<thead>
<tr>
<th>Type</th>
<th>Identifier[Field limit 1,Field limit 2]</th>
<th>description:</th>
<th>Referenc e to literature</th>
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</table>

description:
Description lines ...

description of field limits:
Description of field limit 1
Description of field limit 2

axis identifier:
Axis type 1
Axis type 2, ...

unit:
run-in
main run
runin stp
Mrun syn
PP
SA
OPI
OEM
access rights

read:
X
X
X
X
X
X
X
X

write:
X
X
X
X
X
X
X
Access level

attributes:
global
block search
link

X
Search run condition
Link condition

1.1.2 R parameters

<table>
<thead>
<tr>
<th>DOUBLE</th>
<th>R[n]</th>
<th>description:</th>
</tr>
</thead>
</table>

description:
Array variable Rn or R[n] is an arithmetic variable of type Real and is user-definable.
Rn or R[n] is used to program the variable in the part program.
$Rn or $R[n] is used to program the variable in a synchronized action.
The arithmetic variables are stored in SRAM and can be read in and out using the data backup feature.
The maximum number of R variables is defined in $MC_MM_NUM_R_PARAM.

axis identifier: | NCK version: | 06.00.00 |

unit:
run-in
main run
runin stp
Mrun syn
PP
SA
OPI
OEM
access rights

read:
X
X
X
X

write:
X
X
X
X

attributes:
global
block search
link

Program sensitive
No restrictions
1.2 Channel-specific synchronized action variables

<table>
<thead>
<tr>
<th>INT</th>
<th>$AC_MARKER[n]</th>
<th>description:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Array variable $AC_MARKER[n] is used to store application-related integer arithmetic results. The variable is stored in DRAM or in SRAM depending on $MC_MM_BUFFERED_AC_MARKER. The array elements of the variable in volatile memory (DRAM) are set to 0 on a Reset.</td>
<td></td>
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<tr>
<td>axis identifier:</td>
<td>NCK version:</td>
<td>43.02.00</td>
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<tr>
<td>unit:</td>
<td>min.: INT_MIN</td>
<td>max.: INT_MAX</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runn stp</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
</tr>
<tr>
<td></td>
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<td>No restrictions</td>
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<table>
<thead>
<tr>
<th>INT</th>
<th>$AC_SYSTEM_MARKER[n]</th>
<th>description:</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Array variable $AC_SYSTEM_MARKER[n] is used to store application-related integer arithmetic results. The variable is reserved for SIEMENS applications. The variable is stored in DRAM or in SRAM depending on $MC_MM_BUFFERED_AC_MARKER. The array elements of the variable in volatile memory (DRAM) are set to 0 on a Reset.</td>
<td></td>
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<tr>
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<td>runn stp</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
</tr>
<tr>
<td></td>
<td>Not classified</td>
<td>No restrictions</td>
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</table>
### $AC\_PARAM[n]$ array variable

**Description:**
Array variable $AC\_PARAM[n]$ is used to store application-related Real arithmetic results. The variable is stored in DRAM or in SRAM depending on $MC\_MM\_BUFFERED\_AC\_PARAM$. The array elements of the variable in volatile memory (DRAM) are set to 0 on a Reset.

**Description of field limits:**
The dimension is defined in MD $MC\_MM\_NUM\_AC\_PARAM$.

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<thead>
<tr>
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<td>unit</td>
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<td>DBL_MIN</td>
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<tr>
<td>run-in</td>
<td>main run</td>
<td>run-in slp</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td>X</td>
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<tr>
<td>attributes</td>
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<td>block search</td>
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<tr>
<td></td>
<td>Not classified</td>
<td>No restrictions</td>
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</table>

### $AC\_SYSTEM\_PARAM[n]$ array variable

**Description:**
Array variable $AC\_SYSTEM\_PARAM[n]$ is used to store application-related Real arithmetic results. The variable is reserved for SIEMENS applications. The variable is stored in DRAM or in SRAM depending on $MC\_MM\_BUFFERED\_AC\_PARAM$. The array elements of the variable in volatile memory (DRAM) are set to 0 on a Reset.

**Description of field limits:**
The dimension is defined in MD $MC\_MM\_NUM\_AC\_SYSTEM\_PARAM$.

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<th>NCK version:</th>
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<tbody>
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<td>main run</td>
<td>run-in slp</td>
</tr>
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<td>read:</td>
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<td>X</td>
</tr>
<tr>
<td>write:</td>
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<td>attributes</td>
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<td>block search</td>
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<td>No restrictions</td>
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</tbody>
</table>
1.3 Channel-specific system variables

### $P_{UBFR}$

**Description:**
Variable $P_{UBFR}$ is used to program the 1st basic frame in the data management system. G500, G54...G599 can be used to activate the corresponding data management frame. The data management frames are stored in SRAM and can be read in and out using the data backup feature. $P_{UBFR}$ is equivalent to $P_{CHBFR}[0]$.

**Application:**
- $P_{UBFR} = \text{ctrans}(x,10) : \text{crot}(z,45)$
- $P_{UBFR}[y, tr] = 5$

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>MACHAX</th>
<th>SPINDLE</th>
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<th>runin stp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>access rights</th>
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</thead>
<tbody>
<tr>
<td><strong>read</strong></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>write</strong></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<th>block search</th>
<th>link</th>
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</thead>
<tbody>
<tr>
<td><strong>Rights</strong></td>
<td>Not classified</td>
<td>No restrictions</td>
<td></td>
</tr>
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</table>

### $P_{SETFRAME}$

**Description:**
Variable $P_{SETFRAME}$ is used to program the active system frame for preset actual value memory and scratching.

On a Reset, the activation of the system frame depends on the following machine data:
- Bit0 in $MC_{RESET\_MODE\_MASK}$
- Bit0 in $MC_{CHSFRAME\_RESET\_MASK}$

<table>
<thead>
<tr>
<th>Axis Identifier</th>
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<th>MACHAX</th>
<th>SPINDLE</th>
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<th>runin stp</th>
<th>Mrun syn</th>
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<th>SA</th>
<th>OPI</th>
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<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td><strong>write</strong></td>
<td>X</td>
<td></td>
<td></td>
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<th>global</th>
<th>block search</th>
<th>link</th>
</tr>
</thead>
<tbody>
<tr>
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<td>No restrictions</td>
<td></td>
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</table>
### FRAME: $P\_EXTFRAME

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<th>CHANAX</th>
<th>MACHAX</th>
<th>SPINDLE</th>
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<tbody>
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<table>
<thead>
<tr>
<th>unit:</th>
<th>min.: DBL_MIN</th>
<th>max.: DBL_MAX</th>
</tr>
</thead>
</table>
| run-in main run runin slp Mrun syn PP SA OPI OEM access rights
| read: X       | X             | X             |
| write: X      | X             | 7             |

attributes: global block search link

Not classified No restrictions

---

### FRAME: $P\_PARTFRAME

<table>
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<th>CHANAX</th>
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<th>max.: DBL_MAX</th>
</tr>
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</table>
| run-in main run runin slp Mrun syn PP SA OPI OEM access rights
| read: X       | X             | X             |
| write: X      | X             | 7             |

attributes: global block search link

Not classified No restrictions

---

Variable $P\_EXTFRAME$ is used to program the active system frame for the external work offset. On a Reset, the activation of the system frame depends on the following machine data:

- Bit0 in $MC\_RESET\_MODE\_MASK$
- Bit1 in $MC\_CHSFFRAME\_RESET\_MASK$

Variable $P\_PARTFRAME$ determines the active system frame for TCARR and PAROT. On a Reset, the activation of the system frame depends on the following machine data:

- Bit0 in $MC\_RESET\_MODE\_MASK$
- $MC\_GCODE\_RESET\_MODE[51]$
- $MC\_GCODE\_RESET\_VALUES[51]$
### 1.3 Channel-specific system variables

#### $\text{P\_TOOLFRAME}$

**Frame:** $\text{FRAME}$

**Description:**
Variable $\text{SP\_TOOLFRAME}$ determines the active system frame for TOROT and TOFRAME. On a Reset, the activation of the system frame depends on the following machine data:

- Bit0 in $\text{MC\_RESET\_MODE\_MASK}$
- $\text{MC\_GCODE\_RESET\_MODE[52]}$
- $\text{MC\_GCODE\_RESET\_VALUES[52]}$

**Axis Identifiers:** GEOAX, CHANAX, MACHAX, SPINDLE

**NCK Version:** 41.00.00

**Run-In:**
- **Main Run:** X
- **Runin Slp:** X
- **Mrun Syn:** X

**Read Access:**
- XX

**Write Access:**
- XX 7

**Attributes:**
- Global
- Block Search
- Link

**Not classified**

**No restrictions**

#### $\text{P\_WPFRAME}$

**Frame:** $\text{FRAME}$

**Description:**
Variable $\text{SP\_WPFRAME}$ is used to program the active system frame for workpiece reference points. On a Reset, the activation of the system frame depends on the following machine data:

- Bit0 in $\text{MC\_RESET\_MODE\_MASK}$
- Bit4 in $\text{MC\_CHSFRAME\_RESET\_MASK}$

**Axis Identifiers:** GEOAX, CHANAX, MACHAX, SPINDLE

**NCK Version:** 44.00.00

**Run-In:**
- **Main Run:** X
- **Runin Slp:** X
- **Mrun Syn:** X

**Read Access:**
- XX

**Write Access:**
- XX 7

**Attributes:**
- Global
- Block Search
- Link

**Not classified**

**No restrictions**
### Variable $P_CYCFRAME

**description:**
Variable $P_CYCFRAME is used to program the active system frame for cycles.

On a Reset, the activation of the system frame depends on the following machine data:

- Bit0 in $MC_RESET_MODE_MASK
- Bit5 in $MC_CHSFRAME_RESET_MASK

**axis identifier:**
- GEOAX
- CHANAX
- MACHAX
- SPINDLE

**NCK version:** 44.00.00

**unit:** -  
**min.:** DBL_MIN  
**max.:** DBL_MAX

<table>
<thead>
<tr>
<th>run-in</th>
<th>main run</th>
<th>runin stp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**attributes:**
- global
- block search
- link

- Not classified
- No restrictions

### Variable $P_TRAFRAME

**description:**
Variable $P_TRAFRAME is used to program the active system frame for transformations. This system frame is configured as follows when a transformation is selected with TRANSMIT or TRACYL:

- $MN_FRAME_GEOAX_CHANGE_MODE = 1 oder 2
- $MC_TRANSMIT_ROT_AX_FRAME_1 = 2
- $MC_TRANSMIT_ROT_AX_FRAME_2 = 2
- $MC_TRACYL_ROT_AX_FRAME_1 = 2
- $MC_TRACYL_ROT_AX_FRAME_2 = 2

**axis identifier:**
- GEOAX
- CHANAX
- MACHAX
- SPINDLE

**NCK version:** 50.00.00

**unit:** -  
**min.:** DBL_MIN  
**max.:** DBL_MAX

<table>
<thead>
<tr>
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<th>main run</th>
<th>runin stp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
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<td>X</td>
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<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**attributes:**
- global
- block search
- link

- Not classified
- No restrictions
1.3 Channel-specific system variables

### FRAME: $P\_CHBFRAME[n]$

**description:**
Array variable $P\_CHBFRAME[n]$ is used to program the nth active basic frame in the channel. On a Reset, the activation of the basic frame depends on the following machine data:
- Bit0 and Bit14 in $MC\_RESET\_MODE\_MASK$
- $MC\_CHBFRAME\_RESET\_MASK$

**description of field limits:**
The dimension is defined in $MC\_MM\_NUM\_BASE\_FRAMES$.

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>MACHAX</th>
<th>SPINDLE</th>
</tr>
</thead>
</table>
| **NCK version:** 16.00.00
| **unit:** | - | min.: | DBL\_MIN | max.: | DBL\_MAX |
| run-in | main run | runin slip | Mrun syn | PP | SA | OPI | OEM | access rights |
| read: | X | X | X |
| write: | X | X | 7 |
| attributes: | global | block search | link |
| Not classified | No restrictions |

### FRAME: $P\_NCBFRAME[n]$

**description:**
Array variable $P\_NCBFRAME[n]$ is used to program the nth active global basic frame. On a Reset, the activation of the basic frame depends on the following machine data:
- Bit0 and Bit14 in $MC\_RESET\_MODE\_MASK$
- $MN\_NCBFRAME\_RESET\_MASK$

**description of field limits:**
The dimension is defined in $MN\_MM\_NUM\_GLOBAL\_BASE\_FRAMES$.

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>MACHAX</th>
<th>SPINDLE</th>
</tr>
</thead>
</table>
| **NCK version:** 16.00.00
| **unit:** | - | min.: | DBL\_MIN | max.: | DBL\_MAX |
| run-in | main run | runin slip | Mrun syn | PP | SA | OPI | OEM | access rights |
| read: | X | X | X |
| write: | X | X | 7 |
| attributes: | global | block search | link |
| Not classified | No restrictions |
### $P\_ACTBFRAME

**Description:** Variable $P\_ACTBFRAME determines the active chained overall basic frame. This frame is produced by chaining together all valid (see $P\_NCBFRMASK) global basic frames and all valid (see $P\_CHBFRMASK) basic frames in the channel. The overall basic frame is always recalculated when a basic frame is activated.

On a Reset, the activation of the basic frames depend on the following machine data:
- Bit0 and Bit14 in $MC\_RESET\_MODE\_MASK
- $MN\_NCBFRAME\_RESET\_MASK
- $MC\_CHBFRAME\_RESET\_MASK

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>MACHAX</th>
<th>SPINDLE</th>
</tr>
</thead>
<tbody>
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<td>Unit</td>
<td>-</td>
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<td>max.</td>
<td>DBL_MIN</td>
</tr>
<tr>
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<td>main run</td>
<td>runin run</td>
<td>Mrun syn</td>
<td>PP</td>
</tr>
<tr>
<td>Read</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Write</td>
<td>XX</td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attributes</td>
<td>global</td>
<td>block search</td>
<td>link</td>
<td></td>
</tr>
</tbody>
</table>

### $P\_BFRAME

**Description:** Variable $P\_BFRAME is used to program the 1st active basic frame in the channel. The variable is equivalent to $P\_CHBFRAME[0].

On a Reset, the activation of the basic frame depends on the following machine data:
- Bit0 and Bit14 in $MC\_RESET\_MODE\_MASK
- $MC\_CHBFRAME\_RESET\_MASK

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>MACHAX</th>
<th>SPINDLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit</td>
<td>-</td>
<td>min.</td>
<td>max.</td>
<td>DBL_MIN</td>
</tr>
<tr>
<td>Run-in</td>
<td>main run</td>
<td>runin run</td>
<td>Mrun syn</td>
<td>PP</td>
</tr>
<tr>
<td>Read</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Write</td>
<td>X</td>
<td>7</td>
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<td></td>
</tr>
<tr>
<td>Attributes</td>
<td>global</td>
<td>block search</td>
<td>link</td>
<td></td>
</tr>
</tbody>
</table>

Not classified No restrictions
### Frame Description

**Frame:** $P_{IFRAME}$

<table>
<thead>
<tr>
<th>Description:</th>
<th>Variable $P_{IFRAME}$ is used to program the active settable frame. A settable data management frame $P_{UIFR}[n]$ becomes the active settable frame on execution of G500, G54 to G599. On a Reset, the activation of the settable frame depends on the following machine data: Bit0 in $MC_{RESET_MODE_MASK}$ $MC_{GCODE_RESET_MODE}[7]$ $MC_{GCODE_RESET_VALUES}[7]$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Axis Identifier:</td>
<td>GEOAX CHANAX MACHAX SPINDLE</td>
</tr>
<tr>
<td>NCK Version:</td>
<td>13.00.00</td>
</tr>
<tr>
<td>Unit:</td>
<td>-</td>
</tr>
<tr>
<td>Min.:</td>
<td>DBL_MIN</td>
</tr>
<tr>
<td>Max.:</td>
<td>DBL_MAX</td>
</tr>
<tr>
<td>Run-in Main Run Runin Stp Mrun Syn PP SA OPI OEM Access Rights</td>
<td>x x x</td>
</tr>
<tr>
<td>Read:</td>
<td>x x</td>
</tr>
<tr>
<td>Write:</td>
<td>x x</td>
</tr>
<tr>
<td>Attributes:</td>
<td>Global Block Search Link</td>
</tr>
</tbody>
</table>

### Frame Description

**Frame:** $P_{PFRAME}$

<table>
<thead>
<tr>
<th>Description:</th>
<th>Variable $P_{PFRAME}$ is used to program the active programmable frame. The programmable frame is retained on a Reset when the following setting is configured: $MC_{PFRAME_RESET_MODE} = 1$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Axis Identifier:</td>
<td>GEOAX CHANAX MACHAX SPINDLE</td>
</tr>
<tr>
<td>NCK Version:</td>
<td>13.00.00</td>
</tr>
<tr>
<td>Unit:</td>
<td>-</td>
</tr>
<tr>
<td>Min.:</td>
<td>DBL_MIN</td>
</tr>
<tr>
<td>Max.:</td>
<td>DBL_MAX</td>
</tr>
<tr>
<td>Run-in Main Run Runin Stp Mrun Syn PP SA OPI OEM Access Rights</td>
<td>x x x</td>
</tr>
<tr>
<td>Read:</td>
<td>x x</td>
</tr>
<tr>
<td>Write:</td>
<td>x x</td>
</tr>
<tr>
<td>Attributes:</td>
<td>Global Block Search Link</td>
</tr>
</tbody>
</table>

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SINUMERIK 840D sl/840Di sl/ 840D/ 840Di, List of System Variables (PGA1), 01/2008
### FRAME: $P\_ACTFRAME

**description:**
The variable $P\_ACTFRAME determines the active chained total frame. The active total frame is calculated using the following formula:

$$
$$

The total frame is recalculated each time a frame belonging to the frame chain is activated and upon a reset.

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>MACHAX</th>
<th>SPINDLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCK version:</td>
<td></td>
<td></td>
<td></td>
<td>06.00.00</td>
</tr>
<tr>
<td>unit:</td>
<td>_</td>
<td>DBL_MIN</td>
<td></td>
<td>DBL_MAX</td>
</tr>
<tr>
<td>run-in:</td>
<td>main run</td>
<td>runin stp</td>
<td>Mrun syn</td>
<td>PP SA OPI OEM</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
<td>link</td>
<td>Not classified</td>
</tr>
</tbody>
</table>

### INT1: $P\_UIFRNUM

**description:**
Variable $P\_UIFRNUM is used to determine the number of the active settable frame. A settable data management frame $P\_UIFR[n] becomes the active settable frame on execution of G500, G54 to G599.

- G500: $P\_UIFRNUM = 0
- G54:   $P\_UIFRNUM = 1
- G599: $P\_UIFRNUM = 99

On a Reset, the activation of the settable frame depends on the following machine data:

- Bit0 in $MC\_RESET\_MODE\_MASK
- $MC\_GCODE\_RESET\_MODE[7]
- $MC\_GCODE\_RESET\_VALUES[7]

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>NCK version:</td>
<td></td>
<td></td>
<td></td>
<td>06.00.00</td>
</tr>
<tr>
<td>unit:</td>
<td>_</td>
<td>0</td>
<td>99</td>
<td></td>
</tr>
<tr>
<td>run-in:</td>
<td>main run</td>
<td>runin stp</td>
<td>Mrun syn</td>
<td>PP SA OPI OEM</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
<td>link</td>
<td>Not classified</td>
</tr>
</tbody>
</table>
### $\text{IN1}$ $P\text{NCBFRMASK}$

**Description:**
Variable $P\text{NCBFRMASK}$ is used to define the NCU-global basic frame included in the calculation of the overall basic frame $P\text{ACTBFRAME}$. The variable is implemented in the form of a bit mask in which the global basic frames can be selected. On a Reset, the mask is initialized by $MN\text{NCBFRAME\_RESET\_MASK}$.

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>NCK Version: 16.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit: - min.: 0 max.: 0xFFFF</td>
<td>run-in: main run: runin stp: Mrun syn: PP: SA: OPT: OEM access rights</td>
</tr>
<tr>
<td>Read: X write: X</td>
<td>attributes: global block search link</td>
</tr>
<tr>
<td>Rights: read: XX write: XX 7</td>
<td>Not classified No restrictions</td>
</tr>
</tbody>
</table>

### $\text{IN1}$ $P\text{CHBFRMASK}$

**Description:**
Variable $P\text{CHBFRMASK}$ is used to define the channel-specific basic frame included in the calculation of the overall basic frame $P\text{ACTBFRAME}$. The variable is implemented in the form of a bit mask in which the basic frames can be selected. On a Reset, the mask is initialized by $MC\text{CHBFRAME\_RESET\_MASK}$.

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>NCK Version: 16.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit: - min.: 0 max.: 0xFFFF</td>
<td>run-in: main run: runin stp: Mrun syn: PP: SA: OPT: OEM access rights</td>
</tr>
<tr>
<td>Read: X write: X</td>
<td>attributes: global block search link</td>
</tr>
<tr>
<td>Rights: read: XX write: XX 7</td>
<td>Not classified No restrictions</td>
</tr>
</tbody>
</table>

### $\text{IN1}$ $P\text{CHSFRMASK}$

**Description:**
Variable $P\text{CHSFRMASK}$ is used to define the channel-specific system frame included in the calculation of the overall frame $P\text{ACTFRAME}$. The variable is implemented in the form of a bit mask in which the system frames can be selected. On a Reset, the mask is initialized by $MC\text{CHSFRAME\_RESET\_MASK}$.

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>NCK Version: 51.03.00</th>
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<tbody>
<tr>
<td>Unit: - min.: 0 max.: 0x7FF</td>
<td>run-in: main run: runin stp: Mrun syn: PP: SA: OPT: OEM access rights</td>
</tr>
<tr>
<td>Read: X write: X</td>
<td>attributes: global block search link</td>
</tr>
<tr>
<td>Rights: read: XX write: XX 7</td>
<td>Not classified No restrictions</td>
</tr>
</tbody>
</table>
### $P_AD[n]$

**Active tool offsets**

- **n**: Parameter numbers 1 - 34
- **n = 1-25**: $TC_DP1$ to $TC_DP25$
- **n = 26**: $TC_DPCF$
- **n = 27**: $TC_DPH$
- **n = 28**: $TC_DPV$
- **n = 29**: $TC_DPV3$
- **n = 30**: $TC_DPV4$
- **n = 31**: $TC_DPV5$
- **n = 32**: $TC_DPVN3$
- **n = 33**: $TC_DPVN4$
- **n = 34**: $TC_DPVN5$

An alarm is issued if a compensation parameter belongs to a function that is not active.

### Description of Field Limits

- **n**: Parameter numbers 1 - 31

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>NCK Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
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<table>
<thead>
<tr>
<th>Unit</th>
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<th>Max.</th>
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</thead>
<tbody>
<tr>
<td>DBL_MIN</td>
<td>DBL_MAX</td>
<td></td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin slip</td>
</tr>
<tr>
<td>read: X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

**Attributes**:
- **Program sensitive**: No restrictions
### Channel-specific system variables

#### $P_{\text{ADT}[34]}$

**Description:**

$P_{\text{ADT}[n]}$

Active tool offsets transformed

- **n**: Parameter numbers 1 - 34
- **$n = 1\text{-}25$**: $\text{TC\_DP1}$ to $\text{TC\_DP25}$
- **$n = 26$**: $\text{TC\_DPCE}$
- **$n = 27$**: $\text{TC\_DPH}$
- **$n = 28$**: $\text{TC\_DPV}$
- **$n = 29$**: $\text{TC\_DPV3}$
- **$n = 30$**: $\text{TC\_DPV4}$
- **$n = 31$**: $\text{TC\_DPV5}$
- **$n = 32$**: $\text{TC\_DPVN3}$
- **$n = 33$**: $\text{TC\_DPVN4}$
- **$n = 34$**: $\text{TC\_DPVN5}$

An alarm is issued if a compensation parameter belongs to a function that is not active.

**Axis identifier:**

- **NCK version**: 43.00.00

**Unit:**

- **-**
- **min.**: DBL\_MIN
- **max.**: DBL\_MAX

**Run-in**

- **main run**: X
- **runin slip**: X
- **Mrun syn**: OPI
- **PP**: OEM
- **SA**: access rights
- **OPI**: read: X
- **OEM**: write: X
- **access rights**: 7

**Attributes:**

- **global**: Program sensitive
- **block search**: No restrictions
- **link**: No restrictions

---

#### $P_{\text{DLNO}}$

**Description:**

$P_{\text{DLNO}}$

Active additive offset number DL=0 - DL='max.'; 'max' = value of $\text{MN\_MM\_MAX\_SUMCORR\_PER\_CUTTEDGE}$

**Axis identifier:**

- **NCK version**: 20.00.00

**Unit:**

- **-**
- **min.**: INT\_MIN
- **max.**: INT\_MAX

**Run-in**

- **main run**: X
- **runin slip**: X
- **Mrun syn**: OPI
- **PP**: OEM
- **SA**: access rights
- **OPI**: read: X
- **OEM**: write: X
- **access rights**: No restrictions

**Attributes:**

- **global**: Not classified
- **block search**: No restrictions
- **link**: No restrictions

---

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1 System variable

1.3 Channel-specific system variables

<table>
<thead>
<tr>
<th>IN1</th>
<th>$P_TOOL</th>
<th>description:</th>
</tr>
</thead>
<tbody>
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<td></td>
<td>$P_TOOL</td>
<td>Active tool cutting edge $D_0 - D_{\text{max}}$; ( \text{'max'} = \text{value of $MN_MM_MAX_CUTTING_EDGE_NO$} )</td>
</tr>
<tr>
<td></td>
<td></td>
<td>axis identifier:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NCK version: 06.00.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>unit: INT_MIN ( \text{min.:} ) INT_MIN ( \text{max.:} ) INT_MAX</td>
</tr>
<tr>
<td></td>
<td></td>
<td>run-in main run run-in stp Mrun syn PP SA OPT OEM access rights</td>
</tr>
<tr>
<td></td>
<td></td>
<td>read: X</td>
</tr>
<tr>
<td></td>
<td></td>
<td>write: X</td>
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<td>attributes: global block search link</td>
</tr>
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<td></td>
<td>Not classified No restrictions</td>
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</table>

<table>
<thead>
<tr>
<th>IN1</th>
<th>$P_TOOLNO</th>
<th>description:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$P_TOOLNO$</td>
<td>Active tool number $T_0 - T_{32000}$; $T$ can be an 8-digit number when ('\text{'flat D number'}) function is active (\text{This command should not generally be used when magazine management is active.}) When magazine management is active, $GETEXET$ should be used instead. (T) number programming always works reliably when $MC_CUTTING_EDGE_DEFAULT=-1$, or $&gt;0$. In cases where $MC_CUTTING_EDGE_DEFAULT=0$, or $=-2$, $T$ number read errors can occur. The $T$ number mechanism is also reliable if it is programmed after $D&gt;0$. Notice: Particularly with a setting of $MC_CUTTING_EDGE_DEFAULT=-2$, $P_TOOLNO$ (the $T$ no. of the active tool with which the currently active $D$ offset has been calculated) and $GETEXET$ (the changed tool) can return different $T$ numbers. (-\rightarrow\text{see also $P_MTHSDC$ and the documentation relating to the subject of multiple toolholders/spindles.})</td>
</tr>
<tr>
<td></td>
<td></td>
<td>axis identifier:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NCK version: 06.00.00</td>
</tr>
<tr>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td>run-in main run run-in stp Mrun syn PP SA OPT OEM access rights</td>
</tr>
<tr>
<td></td>
<td></td>
<td>read: X</td>
</tr>
<tr>
<td></td>
<td></td>
<td>write: X</td>
</tr>
<tr>
<td></td>
<td></td>
<td>attributes: global block search link</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Not classified No restrictions</td>
</tr>
</tbody>
</table>
### INT $P\_TOOLP$

**Description:**

$P\_TOOLP$

Last programmed tool number T0 - T32000 (in operation without magazine management).

This command cannot be used when magazine management is active.

When magazine management is active, GETSELT must be used instead.

If the function 'T alarm delay after M06' is active, the result T number = -1 if the preceding T address has been programmed incorrectly.

<table>
<thead>
<tr>
<th>Axis Identifier:</th>
<th>NCK Version:</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit: run-in, main run, runin sip, Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<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>
</tbody>
</table>

| Read: X | Write: X |

**Attributes:**

- Global
- Block search
- Link
- Program sensitive
- No restrictions

### DOUBLE $P\_TOOLL[n]$

**Description:**

$P\_TOOLL[n]$

Active tool total length

**Description of Field Limits:**

n: Length 1 - 3

<table>
<thead>
<tr>
<th>Axis Identifier:</th>
<th>NCK Version:</th>
</tr>
</thead>
<tbody>
<tr>
<td>mm, min.: DBL_MIN</td>
<td>06.00.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit: run-in, main run, runin sip, Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>min.:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>max.:</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

| Read: X | Write: X |

**Attributes:**

- Global
- Block search
- Link
- Not classified
- No restrictions

### DOUBLE $P\_TOOLO[n]$

**Description:**

$P\_TOOLO[n]$

Active tool orientation

**Description of Field Limits:**

n: Components 1 - 3

<table>
<thead>
<tr>
<th>Axis Identifier:</th>
<th>NCK Version:</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>44.00.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit: run-in, main run, runin sip, Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<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>
</tbody>
</table>

| Read: X | Write: X |

**Attributes:**

- Global
- Block search
- Link
- Not classified
- No restrictions
<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
<th>NCK version</th>
<th>Axis Identifier</th>
<th>Unit</th>
<th>Min.</th>
<th>Max.</th>
<th>Run-in</th>
<th>Main Run</th>
<th>Run In Step</th>
<th>Mrun Syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>Access Rights</th>
<th>Read</th>
<th>Write</th>
<th>Attributes</th>
<th>Link</th>
<th>Restrictions</th>
</tr>
</thead>
<tbody>
<tr>
<td>$AC_TOOLO_ACT[3]$</td>
<td>Active command orientation</td>
<td>51.00.00</td>
<td>-</td>
<td>-1.0</td>
<td>1.0</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Not classified</td>
<td>No restrictions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$AC_TOOLO_END[3]$</td>
<td>End orientation of active block</td>
<td>51.00.00</td>
<td>-</td>
<td>-1.0</td>
<td>1.0</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Not classified</td>
<td>No restrictions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$AC_TOOLO_DIFF$</td>
<td>Remaining angle of tool orientation in active block</td>
<td>51.00.00</td>
<td>deg.</td>
<td>0.0</td>
<td>360.0</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Not classified</td>
<td>No restrictions</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### 1.3 Channel-specific system variables

<table>
<thead>
<tr>
<th>Description</th>
<th>DOUBLE</th>
<th>SVC_TOOLO[3]</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Actual orientation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>description</td>
<td></td>
<td>description</td>
</tr>
<tr>
<td>$VC_{TOOLO}[n]$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>n: Components 1 - 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>axis identifier:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>n: Components 1 - 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>unit:</td>
<td>-</td>
<td>min.: -1.0</td>
</tr>
<tr>
<td>run-in main run runin stp Mrun syn PP SA OPT OEM access rights</td>
<td></td>
<td></td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
</tr>
<tr>
<td></td>
<td>Not classified</td>
<td>No restrictions</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
<th>DOUBLE</th>
<th>SVC_TOOLO_DIFF</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Angle between command and actual orientation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>description</td>
<td></td>
<td>description</td>
</tr>
<tr>
<td>$VC_{TOOLO_DIFF}$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>axis identifier:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NCK version:</td>
<td>51.00.00</td>
<td></td>
</tr>
<tr>
<td>unit:</td>
<td>deg.</td>
<td>min.: 0.0</td>
</tr>
<tr>
<td>run-in main run runin stp Mrun syn PP SA OPT OEM access rights</td>
<td></td>
<td></td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
</tr>
<tr>
<td></td>
<td>Not classified</td>
<td>No restrictions</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
<th>INT</th>
<th>SVC_TOOLO_STAT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Status of calculation of actual orientation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>description</td>
<td></td>
<td>description</td>
</tr>
<tr>
<td>$VC_{TOOLO_STAT}$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>axis identifier:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NCK version:</td>
<td>51.00.00</td>
<td></td>
</tr>
<tr>
<td>unit:</td>
<td>-</td>
<td>min.: -1</td>
</tr>
<tr>
<td>run-in main run runin stp Mrun syn PP SA OPT OEM access rights</td>
<td></td>
<td></td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
</tr>
<tr>
<td></td>
<td>Not classified</td>
<td>No restrictions</td>
</tr>
</tbody>
</table>
### 1.3 Channel-specific system variables

<table>
<thead>
<tr>
<th>INT</th>
<th>$P_TC$</th>
<th>description:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$P_TC$</td>
<td>Active toolholder</td>
</tr>
<tr>
<td>axis identifier:</td>
<td>NCK version: 20.00.00</td>
<td></td>
</tr>
<tr>
<td>unit:</td>
<td>-</td>
<td>min.: 0</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin stp</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>attributes: global</td>
<td>block search</td>
<td>link</td>
</tr>
<tr>
<td>Not classified</td>
<td>No restrictions</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>INT</th>
<th>$AC_TC$</th>
<th>description:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$AC_TC$</td>
<td>Active toolholder</td>
</tr>
<tr>
<td>axis identifier:</td>
<td>NCK version: 49.00.00</td>
<td></td>
</tr>
<tr>
<td>unit:</td>
<td>-</td>
<td>min.: 0</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin stp</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>attributes: global</td>
<td>block search</td>
<td>link</td>
</tr>
<tr>
<td>Not classified</td>
<td>No restrictions</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>INT</th>
<th>$P_TCNUM$</th>
<th>description:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$P_TCNUM$</td>
<td>Number of available toolholders in the channel</td>
</tr>
<tr>
<td>axis identifier:</td>
<td>NCK version: 52.00.00</td>
<td></td>
</tr>
<tr>
<td>unit:</td>
<td>-</td>
<td>min.: 0</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin stp</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>attributes: global</td>
<td>block search</td>
<td>link</td>
</tr>
<tr>
<td>Not classified</td>
<td>No restrictions</td>
<td></td>
</tr>
</tbody>
</table>
### $\texttt{SP\_TCANG}[2]$ - active angle of a toolholder axis

**Description:**

$\texttt{SP\_TCANG}[n]$ - active angle of a toolholder axis.

**Field Limits:**

- **n**: Angle 1 - 2
- **Unit**: -
- **Min.**: DBL\_MIN
- **Max.**: DBL\_MAX
- **Run-In**: run-in
- **Main Run**: main run
- **Run In Slip**: runin slip
- **Mrun Synchro**: Mrun syn

**Access Rights:**

- Read: X
- Write: X

**Attributes:**

- Global
- Block Search
- Link

**NCK Version:** 16.00.00

**Not Classified:** No restrictions

### $\texttt{SP\_TCDIFF}[2]$ - difference between calculated and used angle of a toolholder axis with angle incrementation (Hirth tooth system)

**Description:**

$\texttt{SP\_TCDIFF}[n]$ - difference between calculated and used angle of a toolholder axis with angle incrementation (Hirth tooth system).

**Field Limits:**

- **n**: Angle 1 - 2
- **Unit**: -
- **Min.**: DBL\_MIN
- **Max.**: DBL\_MAX
- **Run-In**: run-in
- **Main Run**: main run
- **Run In Slip**: runin slip
- **Mrun Synchro**: Mrun syn

**Access Rights:**

- Read: X
- Write: X

**Attributes:**

- Global
- Block Search
- Link

**NCK Version:** 20.00.00

**Not Classified:** No restrictions

### $\texttt{SP\_TCSOL}$ - number of solutions when the angle of the axis of rotation of an orientable tool carrier is defined from a frame

**Description:**

$\texttt{SP\_TCSOL}$ - number of solutions when the angle of the axis of rotation of an orientable tool carrier is defined from a frame.

- In the case of 0 to 2 solutions, the relevant value is returned.
- The return value is 3 when the number of solutions is infinite.
- If the angles are specified (TCOABS), the number of solutions is always 1.

**Field Limits:**

- **Unit**: -
- **Min.**: max.: 3

**Access Rights:**

- Read: X
- Write: X

**Attributes:**

- Global
- Block Search
- Link

**NCK Version:** 43.00.00

**Not Classified:** No restrictions
### 1.3 Channel-specific system variables

#### $P_{TCSTAT}$

<table>
<thead>
<tr>
<th>INT</th>
<th>$P_{TCSTAT}$</th>
</tr>
</thead>
</table>
| **Description:** | Specifies the status of an orientatable toolholder. The variable is bit-coded with the following bit meanings:  
0x1         The first axis of rotation exists  
0x2         The second axis of rotation exists  
0x4         The angles used in the calculation are acquired from an orientation in the frame direction  
0x8         The angles used in the calculation have been specified absolutely  
0x10        The polar axis angle is uncertain with the toolholder orientated in the frame direction  
0x1000      Only the tool is rotatable (kinematic type T)  
0x2000      Only the workpiece is rotatable (kinematic type P)  
0x4000      Tool and workpiece are rotatable (kinematic type M)  
The bits specified here are not currently assigned. |

<table>
<thead>
<tr>
<th>Axis</th>
<th>Identifier:</th>
<th>NCK version:</th>
<th>49.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit</td>
<td>-</td>
<td>min.:</td>
<td>max.:</td>
</tr>
<tr>
<td>Run-in</td>
<td>main run</td>
<td>runin stp</td>
<td>Mrun syn</td>
</tr>
<tr>
<td>Read</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Write</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attributes:</td>
<td>global</td>
<td>block search</td>
<td>smx</td>
</tr>
<tr>
<td>Not classified</td>
<td>No restrictions</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### $P_{TOOLR}$

<table>
<thead>
<tr>
<th>DOUBLE</th>
<th>$P_{TOOLR}$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description:</strong></td>
<td>Active tool radius (total)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Axis</th>
<th>Identifier:</th>
<th>NCK version:</th>
<th>06.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit</td>
<td>mm</td>
<td>min.:</td>
<td>max.:</td>
</tr>
<tr>
<td>Run-in</td>
<td>main run</td>
<td>runin stp</td>
<td>Mrun syn</td>
</tr>
<tr>
<td>Read</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Write</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attributes:</td>
<td>global</td>
<td>block search</td>
<td>smx</td>
</tr>
<tr>
<td>Not classified</td>
<td>No restrictions</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### 1.3 Channel-specific system variables

#### INT

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>$P_TOOLND[32000]$</td>
<td>Number of tool edges of tool t</td>
</tr>
</tbody>
</table>

- **Description**: $P\_TOOLND[t]$
- **NCK version**: 13.00.00
- **Unit**: -
- **Min.**: INT_MIN
- **Max.**: INT_MAX
- **Run-in**: main run, runin slp, Mrun syn
- **PP**: SA
- **SA**: OPT
- **OEM**: access rights
- **Read**: X
- **Write**: X
- **Attributes**: global, block search, link
- **Access rights**: Not classified, No restrictions

#### BOOL

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>$P_TOOLEXIST[32000]$</td>
<td>Does the tool with T no. t exist</td>
</tr>
</tbody>
</table>

- **Description**: $P\_TOOLEXIST[t]$
- **NCK version**: 13.00.00
- **Unit**: -
- **Min.**: FALSE
- **Max.**: TRUE
- **Run-in**: main run, runin slp, Mrun syn
- **PP**: SA
- **SA**: OPT
- **OEM**: access rights
- **Read**: X
- **Write**: X
- **Attributes**: global, block search, link
- **Access rights**: Program sensitive, No restrictions

#### INT

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>$P_D$</td>
<td>Programmed D number in ISO_2.1 language mode</td>
</tr>
</tbody>
</table>

- **Description**: $P\_D$
- **NCK version**: 18.00.00
- **Unit**: -
- **Min.**: INT_MIN
- **Max.**: INT_MAX
- **Run-in**: main run, runin slp, Mrun syn
- **PP**: SA
- **SA**: OPT
- **OEM**: access rights
- **Read**: X
- **Write**: X
- **Attributes**: global, block search, link
- **Access rights**: Program sensitive, No restrictions
### $P_H$

**Programmed H number in ISO_2.1 language mode**

The H number is the tool offset number in ISO mode 2.1 (milling). If no tool offset is active, the value 0 is output.

The tool offset can be selected with D or H. However, this variable only ever contains the H value.

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>INT_MIN</th>
<th>max:</th>
<th>INT_MAX</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>main run</td>
<td>run-in</td>
<td>Mrun syn</td>
</tr>
<tr>
<td>PP</td>
<td>SA</td>
<td>OPT</td>
<td>OEM</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
<td>link</td>
</tr>
</tbody>
</table>

**Program sensitive No restrictions**

### $A_TOOLMN[32000]$

**Magazine number of tool t**

**description of field limits:**

- t: T number 1 - 32000

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>INT_MIN</th>
<th>max:</th>
<th>INT_MAX</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>main run</td>
<td>run-in</td>
<td>Mrun syn</td>
</tr>
<tr>
<td>PP</td>
<td>SA</td>
<td>OPT</td>
<td>OEM</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
<td>link</td>
</tr>
</tbody>
</table>

**Not classified No restrictions**

### $A_TOOLMLN[32000]$

**Magazine location number of tool t**

**description of field limits:**

- t: T number 1 - 32000

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>INT_MIN</th>
<th>max:</th>
<th>INT_MAX</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>main run</td>
<td>run-in</td>
<td>Mrun syn</td>
</tr>
<tr>
<td>PP</td>
<td>SA</td>
<td>OPT</td>
<td>OEM</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
<td>link</td>
</tr>
</tbody>
</table>

**Not classified No restrictions**
### 1.3 Channel-specific system variables

#### $\text{SA\_MYMN[32000]}$

**Description:**

$\text{SA\_MYMN[t]}$

Number of home magazine of tool with T no. t.

(A magazine becomes the home magazine of the tool if the tool is being loaded onto a magazine location of kind 1 ($\text{TC\_MPP1}=1$).)

Resulting value $= 0$ = tool is not loaded (if $\text{SA\_TOOLMN} > 0$, then manual tool).

Resulting value $= -1$ = tool management is not active

Resulting value $= -2$ = tool with T no. t does not exist.

**Description of field limits:**

- **t**: T number 1 - 32000

**Axis identifier:**

<table>
<thead>
<tr>
<th>NCK version:</th>
<th>41.00.00</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>run-in</th>
<th>main run</th>
<th>runin stp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Attributes:**

- global
- block
- search
- link

Not classified

No restrictions

#### $\text{SA\_MYMLN[32000]}$

**Description:**

$\text{SA\_MYMLN[t]}$

Number of the home magazine location of the tool with T no. t.

(A magazine location becomes the home magazine location of a tool if the tool is being loaded onto a magazine location of kind 1 ($\text{TC\_MPP1}=1$).)

Resulting value $= 0$ = tool is not loaded (if $\text{SA\_TOOLMLN} > 0$, then manual tool).

Resulting value $= -1$ = tool management is not active

Resulting value $= -2$ = tool with T no. t does not exist.

**Description of field limits:**

- **t**: T number 1 - 32000

**Axis identifier:**

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<thead>
<tr>
<th>NCK version:</th>
<th>41.00.00</th>
</tr>
</thead>
</table>

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<th>main run</th>
<th>runin stp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td></td>
<td></td>
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<td></td>
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**Attributes:**

- global
- block
- search
- link

Not classified

No restrictions
### 1.3 Channel-specific system variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Type</th>
<th>Description</th>
<th>NCK version</th>
<th>Unit</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>$A_{MONIFACT}$</td>
<td>DOUBLE</td>
<td>Factor for tool life monitoring</td>
<td>13.00.00</td>
<td>DBL_MIN</td>
<td>DBL_MAX</td>
<td>X X X X X</td>
<td>Read: XX XXXX, Write: XXX XX X7</td>
</tr>
<tr>
<td>$P_{TOOLNG}$</td>
<td>INT</td>
<td>Number of defined tool groups assigned to the channel</td>
<td>42.00.00</td>
<td>INT_MIN</td>
<td>INT_MAX</td>
<td>X</td>
<td>Read: X, Write: X X</td>
</tr>
<tr>
<td>$P_{TOOLNT}$</td>
<td>INT</td>
<td>Number of defined tools assigned to the channel</td>
<td>42.00.00</td>
<td>INT_MIN</td>
<td>INT_MAX</td>
<td>X</td>
<td>Read: X, Write: X X</td>
</tr>
</tbody>
</table>
### 1.3 Channel-specific system variables

**INT $P\_TOOLT[600]$**

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$P_TOOLT[i]$</td>
</tr>
<tr>
<td>$i$th tool number $T$</td>
</tr>
<tr>
<td>OPI block type= TV</td>
</tr>
<tr>
<td>Description of field limits:</td>
</tr>
<tr>
<td>$i= 1, \ldots, $P_TOOLTNT</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Axis Identifier:</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCK version: 42.00.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit</th>
<th>MIN</th>
<th>MAX</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td></td>
<td></td>
</tr>
<tr>
<td>main run</td>
<td></td>
<td></td>
</tr>
<tr>
<td>runin slip</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mrun syn</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OPI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OEM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access Rights</td>
<td></td>
<td></td>
</tr>
<tr>
<td>read: X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Attributes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>global block search link</td>
</tr>
</tbody>
</table>

**INT $P\_TOOLD[32000,12]$**

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$P_TOOLD[t,i]$</td>
</tr>
<tr>
<td>$i$th D no. of tool with $T$ no. $t$; $i=1,2\ldots$</td>
</tr>
<tr>
<td>If $t$ is the value of an undefined tool, -2 is returned</td>
</tr>
<tr>
<td>If $i$ is a value outside the permissible range, 0 is returned</td>
</tr>
<tr>
<td>OPI block type= TO</td>
</tr>
<tr>
<td>Description of field limits:</td>
</tr>
<tr>
<td>$t = 1, \ldots, 32000$</td>
</tr>
<tr>
<td>$i = 1, \ldots, $P_TOOLNTD</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Axis Identifier:</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCK version: 42.00.00</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Unit</th>
<th>MIN</th>
<th>MAX</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td></td>
<td></td>
</tr>
<tr>
<td>main run</td>
<td></td>
<td></td>
</tr>
<tr>
<td>runin slip</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mrun syn</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OPI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OEM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access Rights</td>
<td></td>
<td></td>
</tr>
<tr>
<td>read: X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td></td>
<td></td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Attributes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>global block search link</td>
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</tbody>
</table>

Not classified No restrictions
### 1.3 Channel-specific system variables

#### INT \$P\_USEKT

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$P_USEKT (= USE Kind of Tool)</td>
</tr>
<tr>
<td>Is a bit-coded value</td>
</tr>
<tr>
<td>All tools whose parameter $TC_TP11 has set one of the bits of $P_USEKT</td>
</tr>
<tr>
<td>are available for the following tool changes. The value 'zero' has the equivalent content of 'all bits are set'</td>
</tr>
<tr>
<td>OPI block= C/S</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Axis identifier:</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCK version: 43.00.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit:</th>
<th>min.:</th>
<th>INT_MIN</th>
<th>max.:</th>
<th>INT_MAX</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin slip</td>
<td>Mrun syn</td>
<td>PP</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Attributes:</th>
<th>global</th>
<th>block search</th>
<th>link</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not classified</td>
<td>No restrictions</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### INT \$P\_TOOLNDL[32000,32000]

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$P_TOOLNDL[t,d]</td>
</tr>
<tr>
<td>Number of DL offsets of D offset specified by T no. t and D no. d</td>
</tr>
<tr>
<td>&gt;0 Number of DL offsets</td>
</tr>
<tr>
<td>0 No DL offset for this D offset</td>
</tr>
<tr>
<td>-1 Additive offset function not active</td>
</tr>
<tr>
<td>-2t is the value of an undefined tool</td>
</tr>
<tr>
<td>-3 d is the value of an undefined D offset</td>
</tr>
<tr>
<td>OPI block type= TOS; TOE</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description of field limits:</th>
</tr>
</thead>
<tbody>
<tr>
<td>t = 1, ..., 32000</td>
</tr>
<tr>
<td>d = 1, ..., 32000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Axis identifier:</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCK version: 43.00.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit:</th>
<th>min.:</th>
<th>INT_MIN</th>
<th>max.:</th>
<th>INT_MAX</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin slip</td>
<td>Mrun syn</td>
<td>PP</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Attributes:</th>
<th>global</th>
<th>block search</th>
<th>link</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not classified</td>
<td>No restrictions</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### 1.3 Channel-specific system variables

<table>
<thead>
<tr>
<th>INT</th>
<th>$P_MAGN$</th>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$P_MAGN$</td>
<td>Number of defined magazines assigned to the channel.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$&gt; 0$: Successful read access</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$0$: No magazine defined</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$-1$: WZMG is not active</td>
</tr>
<tr>
<td></td>
<td>axis</td>
<td>OPI block = TM</td>
</tr>
<tr>
<td></td>
<td>identifier:</td>
<td>NCK version: 43.00.00</td>
</tr>
<tr>
<td></td>
<td>unit:</td>
<td>INT_MIN</td>
</tr>
<tr>
<td></td>
<td>run-in</td>
<td>main run</td>
</tr>
<tr>
<td></td>
<td>read:</td>
<td>$X$</td>
</tr>
<tr>
<td></td>
<td>write:</td>
<td>Not classified</td>
</tr>
<tr>
<td></td>
<td>attributes:</td>
<td>global</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>INT</th>
<th>$P_MAG[32]$</th>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$P_MAG[i]$</td>
<td>ith magazine number</td>
</tr>
<tr>
<td></td>
<td>$&gt; 0$: Successful read access</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$0$: $i$ is outside the permissible range</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$-1$: WZMG is not active</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OPI block = TM</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Description of field limits:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$i = 1, \ldots, #P_MAGN$</td>
<td></td>
</tr>
<tr>
<td></td>
<td>axis</td>
<td>identifier:</td>
</tr>
<tr>
<td></td>
<td>unit:</td>
<td>INT_MIN</td>
</tr>
<tr>
<td></td>
<td>run-in</td>
<td>main run</td>
</tr>
<tr>
<td></td>
<td>read:</td>
<td>$X$</td>
</tr>
<tr>
<td></td>
<td>write:</td>
<td>Not classified</td>
</tr>
<tr>
<td></td>
<td>attributes:</td>
<td>global</td>
</tr>
</tbody>
</table>

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SINUMERIK 840D sl/840Di sl/ 840D/ 840Di, List of System Variables (PGA1), 01/2008
### 1.3 Channel-specific system variables

#### INT $P\_MAGNDIS[32000,32000]$

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>$P_MAGNDIS[ n, m ]$</td>
</tr>
<tr>
<td>Number of magazines connected to location m of internal magazine n.</td>
</tr>
<tr>
<td>&gt; 0</td>
</tr>
<tr>
<td>0</td>
</tr>
<tr>
<td>-1</td>
</tr>
<tr>
<td>-2</td>
</tr>
<tr>
<td>-3</td>
</tr>
</tbody>
</table>

**OPI block TPM**

**description of field limits:**

- n= must be the number of the buffer magazine or load magazine
- m= 1,..., max. number of a location in the specified internal magazine

**axis identifier:**

- NCK version: 43.00.00
- run-in run runin stp Mrun syn PP SA OPI OEM access rights
- read: X X X
- write: X
- attributes: global block search link
- Not classified No restrictions

#### INT $P\_MAGDISS[32000,32]$

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>$P_MAGDISS[ l, i ]$</td>
</tr>
<tr>
<td>Number of ith magazine connected to location l of the buffer magazine.</td>
</tr>
<tr>
<td>&gt; 0</td>
</tr>
<tr>
<td>0</td>
</tr>
<tr>
<td>-1</td>
</tr>
<tr>
<td>-2</td>
</tr>
<tr>
<td>-3</td>
</tr>
</tbody>
</table>

**OPI block TPM**

**description of field limits:**

- l= 1,..., max. number of a location in the buffer magazine
- i= 1,..., $P\_MAGNDIS[ no. of buffer magazine, refLoc ]$

**axis identifier:**

- NCK version: 43.00.00
- run-in run runin stp Mrun syn PP SA OPI OEM access rights
- read: X X X
- write: X
- attributes: global block search link
- Not classified No restrictions
### 1.3 Channel-specific system variables

<table>
<thead>
<tr>
<th>INT</th>
<th>$P_MAGDISL[32000,32]$</th>
</tr>
</thead>
<tbody>
<tr>
<td>description:</td>
<td>$P_MAGDISL[l,i]$</td>
</tr>
<tr>
<td>Number of $i$th magazine connected to location $l$ of the load magazine.</td>
<td></td>
</tr>
<tr>
<td>&gt; 0</td>
<td>Successful read access</td>
</tr>
<tr>
<td>0</td>
<td>$i$ is outside the permissible range</td>
</tr>
<tr>
<td>-1</td>
<td>WZMG is not active</td>
</tr>
<tr>
<td>-2</td>
<td>$m$ is not the number of a load magazine location</td>
</tr>
<tr>
<td>-3</td>
<td>no load magazine defined</td>
</tr>
<tr>
<td>OPI block TPM</td>
<td></td>
</tr>
<tr>
<td>description of field limits:</td>
<td></td>
</tr>
<tr>
<td>$l$ = 1,..., max. number of a location in the load magazine</td>
<td></td>
</tr>
<tr>
<td>$i$ = 1,..., $P_MAGNDIS[no. of load magazine, refLoc]$</td>
<td></td>
</tr>
<tr>
<td>axis identifier:</td>
<td>INT_MIN</td>
</tr>
<tr>
<td>unit:</td>
<td>INT_MIN</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td></td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
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<tr>
<td></td>
<td>Not classified</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>INT</th>
<th>$P_MAGNS$</th>
</tr>
</thead>
<tbody>
<tr>
<td>description:</td>
<td>$P_MAGNS$</td>
</tr>
<tr>
<td>Number of spindle locations / toolholder locations in the buffer assigned to the channel.</td>
<td></td>
</tr>
<tr>
<td>&gt; 0</td>
<td>Successful read access</td>
</tr>
<tr>
<td>0</td>
<td>No spindle locations defined</td>
</tr>
<tr>
<td>-1</td>
<td>WZMG is not active</td>
</tr>
<tr>
<td>-3</td>
<td>No buffer magazine defined</td>
</tr>
<tr>
<td>axis identifier:</td>
<td>INT_MIN</td>
</tr>
<tr>
<td>unit:</td>
<td>INT_MIN</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td></td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
</tr>
<tr>
<td></td>
<td>Not classified</td>
</tr>
</tbody>
</table>
### 1.3 Channel-specific system variables

<table>
<thead>
<tr>
<th>INT</th>
<th>$P_MAGS[20]$</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>description:</td>
<td>$P_MAGS[ n ]$</td>
<td>nth number of spindle / toolholder in buffer</td>
</tr>
<tr>
<td></td>
<td>&gt; 0</td>
<td>Successful read access</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>n is outside the permissible range</td>
</tr>
<tr>
<td></td>
<td>-1</td>
<td>WZMG is not active</td>
</tr>
<tr>
<td></td>
<td>-3</td>
<td>No buffer magazine defined</td>
</tr>
<tr>
<td>description of field limits:</td>
<td>n= 1,..., max. toolholder number</td>
<td></td>
</tr>
<tr>
<td>axis identifier:</td>
<td>NCK version: 43.00.00</td>
<td></td>
</tr>
<tr>
<td>unit:</td>
<td>INT_MIN</td>
<td>INT_MAX</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin slip</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
</tr>
<tr>
<td>Not classified</td>
<td>No restrictions</td>
<td></td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>INT</th>
<th>$P_MAGNREL[20]$</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>description:</td>
<td>$P_MAGNREL[ n ]$</td>
<td>Number of buffers assigned to the spindle number / toolholder number n</td>
</tr>
<tr>
<td></td>
<td>&gt; 0</td>
<td>Successful read access</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>No buffer location assigned to spindle location</td>
</tr>
<tr>
<td></td>
<td>-1</td>
<td>WZMG is not active</td>
</tr>
<tr>
<td></td>
<td>-2</td>
<td>n is not the number of a spindle location</td>
</tr>
<tr>
<td></td>
<td>-3</td>
<td>No buffer magazine defined</td>
</tr>
<tr>
<td>description of field limits:</td>
<td>n= 1,..., max. toolholder number</td>
<td></td>
</tr>
<tr>
<td>axis identifier:</td>
<td>NCK version: 43.00.00</td>
<td></td>
</tr>
<tr>
<td>unit:</td>
<td>INT_MIN</td>
<td>INT_MAX</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin slip</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td></td>
<td></td>
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<td>attributes:</td>
<td>global</td>
<td>block search</td>
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<tr>
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<td>No restrictions</td>
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</tbody>
</table>
### 1.3 Channel-specific system variables

<table>
<thead>
<tr>
<th>INT</th>
<th>$P_MAGREL[20,600]</th>
<th>description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>P_MAGREL[ n, m ]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>mth buffer number of nth spindle number / toolholder number</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 0Successful read access</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0m is outside the permissible range</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-1WZMG is not active</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-2n is not the number of a spindle location</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-3No buffer magazine defined</td>
</tr>
</tbody>
</table>

**field limits:**
- \( n = 1, \ldots, \text{max. toolholder number} \)
- \( m = 1, \ldots, P\_MAGREL \)

**axis identifier:**
- NCK version: 43.00.00
- unit: - min.: INT\_MIN max.: INT\_MAX
- run-in main run runin sp Irun syn PP SA OPI OEM access rights
- read: X X
- write: X X
- attributes: global block search sink

**Not classified No restrictions**

<table>
<thead>
<tr>
<th>INT</th>
<th>$P_MAGNH</th>
<th>description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>$P_MAGNH</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Number of defined magazine location type hierarchies assigned to the channel.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 0Successful read access</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0No location type hierarchies are defined</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-1WZMG is not active</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OPI block= TT</td>
</tr>
</tbody>
</table>

**axis identifier:**
- NCK version: 43.00.00
- unit: - min.: INT\_MIN max.: INT\_MAX
- run-in main run runin sp Irun syn PP SA OPI OEM access rights
- read: X X X
- write: X X X
- attributes: global block search sink

**Not classified No restrictions**
### 1.3 Channel-specific system variables

#### Description

**$P\_MAGNHLT[\text{n}]**

Number of defined location types in the \text{n}th defined hierarchy

- \text{>0} Successful read access
- \text{0} \text{in is outside the defined range}
- -1 Function 'Location type hierarchy' or TMMG is not active
- \text{OPI block} = \text{TT}

**Description of field limits:**

- \text{n} = 1,..., \$P\_MAGNH

**Axis identifier:**

- NCK version: 43.00.00

<table>
<thead>
<tr>
<th>Run-in</th>
<th>Main Run</th>
<th>Runin Stp</th>
<th>Mrun Syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>Access Rights</th>
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<tbody>
<tr>
<td>read</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>write</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Attributes:**

- Not classified
- No restrictions

#### Description

**$P\_MAGHLT[\text{n, m}]**

\text{m}th location type of hierarchy \text{n}; \text{n} = 1,..., \$P\_MAGNH; \text{m} = 1,..., \$P\_MAGNHLT

- \text{>0} Successful read access
- \text{0} \text{m is outside the defined range}
- -1 Function 'Location type hierarchy' or TMMG is not active
- -2 Hierarchy \text{n} has no defined location types
- \text{OPI block} = \text{TT}

**Description of field limits:**

- \text{n} = 1,..., \$P\_MAGNH
- \text{m} = 1,..., \$P\_MAGNHLT

**Axis identifier:**

- NCK version: 43.00.00

<table>
<thead>
<tr>
<th>Run-in</th>
<th>Main Run</th>
<th>Runin Stp</th>
<th>Mrun Syn</th>
<th>PP</th>
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</thead>
<tbody>
<tr>
<td>read</td>
<td>X</td>
<td>X</td>
<td></td>
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<td>write</td>
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</tr>
</tbody>
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**Attributes:**

- Not classified
- No restrictions
### $P\_MAGNA$

**description:**

$P\_MAGNA$

Number of defined adapters assigned to the channel.

- $> 0$ Successful read access
- $0$ No adapters defined
- $-1$ 'Adapter' function or TMMG is not active

OPI block = AD

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>NCK version:</th>
<th>run-in</th>
<th>main run</th>
<th>runin slip</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
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<table>
<thead>
<tr>
<th>read</th>
<th>write</th>
<th>attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
<td>global, block search, link</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>run-in</th>
<th>main run</th>
<th>runin slip</th>
<th>Mrun syn</th>
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</thead>
<tbody>
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<td>X</td>
<td>X</td>
<td>global, block search, link</td>
</tr>
</tbody>
</table>

### $P\_MAGA[i]$ (i)

**description:**

$i$th adapter number

- $> 0$ Successful read access
- $0$ $i$ is outside the permissible range
- $-1$ 'Adapter' function or TMMG is not active

OPI block = AD

**description of field limits:**

$i = 1,..., P\_MAGNA$

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>NCK version:</th>
<th>run-in</th>
<th>main run</th>
<th>runin slip</th>
<th>Mrun syn</th>
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<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
</tr>
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</tbody>
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<tr>
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<th>write</th>
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<tbody>
<tr>
<td>X</td>
<td>X</td>
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**description:**

$i = 1,..., P\_MAGNA$

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<th>NCK version:</th>
<th>run-in</th>
<th>main run</th>
<th>runin slip</th>
<th>Mrun syn</th>
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<tr>
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<th>write</th>
<th>attributes</th>
</tr>
</thead>
<tbody>
<tr>
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<td>global, block search, link</td>
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</table>

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<th>runin slip</th>
<th>Mrun syn</th>
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</tbody>
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<table>
<thead>
<tr>
<th>read</th>
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</tr>
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<tr>
<th>run-in</th>
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</thead>
<tbody>
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<th>read</th>
<th>write</th>
<th>attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
<td>global, block search, link</td>
</tr>
</tbody>
</table>

Not classified No restrictions
### 1.3 Channel-specific system variables

| INT | $P_{\text{MTHSDC}}$ | description: $P_{\text{MTHSDC}}$ Master toolholder no. or master spindle no. with reference to which the active tool is determined for the next D offset selection.  
0Successful read access  
0No master toolholder or master spindle available.  
The next D offset works with T0.  
-1TMMG not available.  
If read as an OPI variable, this is valid for the status in the current main run block. | NCK version: 48.00.00 |
<table>
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<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>unit:</td>
<td>run-in</td>
<td>main run</td>
</tr>
<tr>
<td>-</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
</tr>
</tbody>
</table>

| DOUBLE | $\$AC_{\text{MONMIN}}$ | description: $\$AC_{\text{MONMIN}}$ Relation between tool monitoring actual value and setpoint.  
Threshold for tool search strategy "Load only tools with an actual value higher than threshold" | NCK version: 18.00.00 |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>unit:</td>
<td>run-in</td>
<td>main run</td>
</tr>
<tr>
<td>-</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
</tr>
</tbody>
</table>

| INT | $P_{\text{VDITCP}[\text{SLTOMA}_\text{MAX}_\text{NUM}_\text{FREE}_\text{PARAM}]}$ | description: $P_{\text{VDITCP}[n]}$ Free parameters for tool management in VDI interface | NCK version: 06.00.00 |
|-----|------------------|-------------------------------------------------|
| unit: | run-in | main run | runin stp | Mrun syn | PP | SA | OPI | OEM | access rights |
| - | X | X | X | X | X | X | X | X | read: XX X write: XX 7 |
| attributes: | global | block search | link | Not classified | No restrictions |
### 1.3 Channel-specific system variables

**DOUBLE $P_ATPG[9]**

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<tr>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$P_ATPG[n]$</td>
</tr>
<tr>
<td>Current tool-related grinding data</td>
</tr>
<tr>
<td><strong>n</strong>: Parameter numbers 1 - 9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>axis identifier:</strong></th>
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<tbody>
<tr>
<td>NCK version: 13.00.00</td>
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</table>

<table>
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<tr>
<th><strong>unit:</strong></th>
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</thead>
<tbody>
<tr>
<td>run-in</td>
</tr>
<tr>
<td>main run</td>
</tr>
<tr>
<td>runin slp</td>
</tr>
<tr>
<td>Mrun syn</td>
</tr>
<tr>
<td>PP</td>
</tr>
<tr>
<td>SA</td>
</tr>
<tr>
<td>OPT</td>
</tr>
<tr>
<td>OEM</td>
</tr>
<tr>
<td><strong>access rights:</strong></td>
</tr>
<tr>
<td>read: X</td>
</tr>
<tr>
<td>write: X</td>
</tr>
<tr>
<td>attributes: global</td>
</tr>
<tr>
<td>block search</td>
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<tr>
<td>link</td>
</tr>
<tr>
<td><strong>Not classified</strong></td>
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<tr>
<td><strong>No restrictions</strong></td>
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</table>

**STRING $P_TOOLENV[1]**

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<th>Description:</th>
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<tbody>
<tr>
<td>$P_TOOLENV[i]$</td>
</tr>
<tr>
<td>Supplies the name of the tool environment stored under the (internal) index i. If i does not refer to a defined data block, a zero string is returned.</td>
</tr>
<tr>
<td>If index i is invalid, i.e. less than 1 or greater than the maximum number of data blocks for tool environments ($MN_MM_NUM_TOOLENV$), an alarm is generated.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>axis identifier:</strong></th>
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</thead>
<tbody>
<tr>
<td>NCK version: 45.00.00</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>unit:</strong></th>
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<tbody>
<tr>
<td>run-in</td>
</tr>
<tr>
<td>main run</td>
</tr>
<tr>
<td>runin slp</td>
</tr>
<tr>
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</tr>
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<td>PP</td>
</tr>
<tr>
<td>SA</td>
</tr>
<tr>
<td>OPT</td>
</tr>
<tr>
<td>OEM</td>
</tr>
<tr>
<td><strong>access rights:</strong></td>
</tr>
<tr>
<td>read: X</td>
</tr>
<tr>
<td>write: X</td>
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<tr>
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<tr>
<td>link</td>
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<tr>
<td><strong>Not classified</strong></td>
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<td><strong>No restrictions</strong></td>
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**INT $P_TOOLENVN**

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<tr>
<th>Description:</th>
</tr>
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<tbody>
<tr>
<td>$P_TOOLENVN$</td>
</tr>
<tr>
<td>Specifies the number of defined data blocks for defining tool environments.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>axis identifier:</strong></th>
</tr>
</thead>
<tbody>
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<table>
<thead>
<tr>
<th><strong>unit:</strong></th>
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<tbody>
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<tr>
<td>OPT</td>
</tr>
<tr>
<td>OEM</td>
</tr>
<tr>
<td><strong>access rights:</strong></td>
</tr>
<tr>
<td>read: X</td>
</tr>
<tr>
<td>write: X</td>
</tr>
<tr>
<td>attributes: global</td>
</tr>
<tr>
<td>block search</td>
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<tr>
<td>link</td>
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### $P\_AP$

Programmed angle with polar coordinates in degrees

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<th>Description: $P_AP$</th>
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<tr>
<td>43.00.00</td>
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<table>
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<table>
<thead>
<tr>
<th>Unit:</th>
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<tr>
<td>DBL_MIN</td>
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<table>
<thead>
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<tbody>
<tr>
<td>X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Write:</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Attributes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global, Block, Search, Link</td>
</tr>
</tbody>
</table>

### $P\_AXN1$

Variable $P\_AXN1$ supplies the current address of the geometry axis for the abscissa.

<table>
<thead>
<tr>
<th>Description: $P_AXN1$</th>
</tr>
</thead>
<tbody>
<tr>
<td>06.00.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Axis identifier:</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCK version: 06.00.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit:</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Run-in:</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Write:</th>
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</thead>
<tbody>
<tr>
<td>X</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Attributes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global, Block, Search, Link</td>
</tr>
</tbody>
</table>

### $P\_AXN2$

Variable $P\_AXN2$ supplies the current address of the geometry axis for the ordinate.

<table>
<thead>
<tr>
<th>Description: $P_AXN2$</th>
</tr>
</thead>
<tbody>
<tr>
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<table>
<thead>
<tr>
<th>Axis identifier:</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCK version: 06.00.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit:</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Run-in:</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Write:</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Attributes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global, Block, Search, Link</td>
</tr>
</tbody>
</table>

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### 1.3 Channel-specific system variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>$P_AXN3</strong></td>
<td>Variable $P_AXN3$ supplies the current address of the geometry axis for the applicate.</td>
</tr>
<tr>
<td><strong>$P_ACTGEOAX[3]$</strong></td>
<td>Variable $SP_ACTGEOAX[n]$ supplies the current geometry axis identifier depending on the plane. The geometry axis assignment corresponds to the programmed GEOAX(1,X,2,Y,3,Z) values. The assignment can also change on a Reset and on selection and deselection of transformations.</td>
</tr>
<tr>
<td><strong>$P_GG[\text{MAX}_\text{GGROUP}]$</strong></td>
<td>Read active G function of G function group n. The index of the G function is supplied as described in the Programming Guide Fundamentals, Section &quot;List of G functions/preparatory functions&quot;. (This also matches the index output at the PLC interface when configured accordingly)</td>
</tr>
</tbody>
</table>

#### Variable: **$P\_AXN3$**

| Description: | **Variable $P\_AXN3$ supplies the current address of the geometry axis for the applicate.** |

<table>
<thead>
<tr>
<th>Axis identifier:</th>
<th>NCK version: 06.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit: -</td>
<td>-</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td></td>
</tr>
<tr>
<td>Attributes:</td>
<td>global</td>
</tr>
<tr>
<td>Access:</td>
<td>Not classified</td>
</tr>
</tbody>
</table>

#### Variable: **$P\_ACTGEOAX[3]$**

| Description: | **Variable $SP\_ACTGEOAX[n]$ supplies the current geometry axis identifier depending on the plane. The geometry axis assignment corresponds to the programmed GEOAX(1,X,2,Y,3,Z) values. The assignment can also change on a Reset and on selection and deselection of transformations.** |

<table>
<thead>
<tr>
<th>Array index</th>
<th>1-3 for 1st - 3rd geometry axis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Axis identifier:</td>
<td>NCK version: 13.00.00</td>
</tr>
<tr>
<td>Unit: -</td>
<td>-</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td></td>
</tr>
<tr>
<td>Attributes:</td>
<td>global</td>
</tr>
<tr>
<td>Access:</td>
<td>Not classified</td>
</tr>
</tbody>
</table>

#### Variable: **$P\_GG[\text{MAX}_\text{GGROUP}]$**

| Description: | **$P\_GG[n]$** The index of the G function is supplied as described in the Programming Guide Fundamentals, Section "List of G functions/preparatory functions". (This also matches the index output at the PLC interface when configured accordingly) |

<table>
<thead>
<tr>
<th>N: Number of G function group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Axis identifier:</td>
</tr>
<tr>
<td>Unit: -</td>
</tr>
<tr>
<td>run-in</td>
</tr>
<tr>
<td>read:</td>
</tr>
<tr>
<td>write:</td>
</tr>
<tr>
<td>Attributes:</td>
</tr>
<tr>
<td>Access:</td>
</tr>
</tbody>
</table>
1 System variable

1.3 Channel-specific system variables

**INT $P\_EXTGG[\text{MAX\_EXT\_GGROUP}]**

<table>
<thead>
<tr>
<th>Description</th>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$P_EXTGG[n]$</td>
<td>Read active G function of G function group n of external language. The index of the G function is supplied as described in the Function Description &quot;ISO Dialects&quot; Section &quot;G commands&quot;. (This also matches the index output at the PLC interface when configured accordingly)</td>
</tr>
</tbody>
</table>

| Example: |
| ;Check for G55 in ISO Dialect T |
| IF $P\_EXTGG[14] == 2 GOTOF LABEL\_G55 |

| Description of Field Limits: |
| n: Number of G function group |
| axis identifier: |
| unit: - min.: 0 max.: INT\_MAX |
| run-in main run runin stp Mrun syn PP SA OPT OEM access rights |
| read: X |
| write: X |
| attributes: global block search link |
| Not classified Not classified |

**INT $A\_GG[\text{MAX\_GGROUP}]**

| Description: |
| $A\_GG[n]$ | Read active G function of G function group n in synchronized action The index of the G function is supplied as described in the Programming Guide Fundamentals, Section "List of G functions/preparatory functions". (This also matches the index output at the PLC interface when configured accordingly) |

| Example: |
| ;Check for G55 in synchronized action |
| WHEN $A\_GG[8] == 3 DO ... |

| Description of Field Limits: |
| n: Number of G function group |
| axis identifier: |
| unit: - min.: 0 max.: INT\_MAX |
| run-in main run runin stp Mrun syn PP SA OPT OEM access rights |
| read: X X X |
| write: |
| attributes: global block search link |
| Not classified Not classified |
### BOOL $P\_SEARCH$

**description:**

$P\_SEARCH$

Returns TRUE (1) if block search is active.

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>NCK version: 06.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit: run-in, run, runin stp, Mrun syn, PP, SA, OPT, OEM</td>
<td>access rights</td>
</tr>
<tr>
<td>read: X</td>
<td>write: X</td>
</tr>
<tr>
<td>attributes: global, block search, link</td>
<td></td>
</tr>
<tr>
<td>Not classified</td>
<td></td>
</tr>
</tbody>
</table>

### BOOL $P\_SEARCH1$

**description:**

$P\_SEARCH1$

Returns TRUE (1) if block search with calculation is active.

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>NCK version: 06.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit: run-in, run, runin stp, Mrun syn, PP, SA, OPT, OEM</td>
<td>access rights</td>
</tr>
<tr>
<td>read: X</td>
<td>write: X</td>
</tr>
<tr>
<td>attributes: global, block search, link</td>
<td></td>
</tr>
<tr>
<td>Not classified</td>
<td></td>
</tr>
</tbody>
</table>

### BOOL $P\_SEARCH2$

**description:**

$P\_SEARCH2$

Returns TRUE (1) if last selected search type was "block search without calculation".

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>NCK version: 06.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit: run-in, run, runin stp, Mrun syn, PP, SA, OPT, OEM</td>
<td>access rights</td>
</tr>
<tr>
<td>read: X</td>
<td>write: X</td>
</tr>
<tr>
<td>attributes: global, block search, link</td>
<td></td>
</tr>
<tr>
<td>Not classified</td>
<td></td>
</tr>
</tbody>
</table>
### 1.3 Channel-specific system variables

<table>
<thead>
<tr>
<th>INT</th>
<th>$P_SEARCHL$</th>
<th>description:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>$P_SEARCHL$ supplies the last selected search type: (coding analogous to PI service _N_FINDBL)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0 : No search</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 : Search without calculation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 : Search with calculation on contour</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 : Reserved</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4 : Search with calculation at end of block</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 : Search in extended program test</td>
</tr>
<tr>
<td></td>
<td></td>
<td>axis identifier:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NCK version: 16.00.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>unit: - min.: 0 max.: 5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>run-in main run runin stp Mrun syn PP SA OPI OEM access rights</td>
</tr>
<tr>
<td></td>
<td></td>
<td>read: X</td>
</tr>
<tr>
<td></td>
<td></td>
<td>write: X</td>
</tr>
<tr>
<td></td>
<td></td>
<td>attributes: global block search link</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Not classified Not classified</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BOOL</th>
<th>$P_SUBPAR[n]$</th>
<th>description:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$P_SUBPAR[n]$ Interrogate whether parameter n was actually programmed (TRUE) on subroutine call with parameter transfer, or whether the system has applied a default parameter (FALSE).</td>
<td></td>
</tr>
<tr>
<td></td>
<td>description of field limits:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>n: Parameter numbers 1 to n according to definition in PROC instruction</td>
<td></td>
</tr>
<tr>
<td></td>
<td>axis identifier:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>NCK version: 14.00.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>unit: - min.: FALSE max.: TRUE</td>
<td></td>
</tr>
<tr>
<td></td>
<td>run-in main run runin stp Mrun syn PP SA OPI OEM access rights</td>
<td></td>
</tr>
<tr>
<td></td>
<td>read: X</td>
<td></td>
</tr>
<tr>
<td></td>
<td>write: X</td>
<td></td>
</tr>
<tr>
<td></td>
<td>attributes: global block search link</td>
<td></td>
</tr>
<tr>
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<td>Not classified Not classified</td>
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</tr>
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<table>
<thead>
<tr>
<th>BOOL</th>
<th>$P_CTABDEF$</th>
<th>description:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$P_CTABDEF$ determines whether a curve table definition is active.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>axis identifier:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>NCK version: 13.00.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>unit: - min.: FALSE max.: TRUE</td>
<td></td>
</tr>
<tr>
<td></td>
<td>run-in main run runin stp Mrun syn PP SA OPI OEM access rights</td>
<td></td>
</tr>
<tr>
<td></td>
<td>read: X</td>
<td></td>
</tr>
<tr>
<td></td>
<td>write: X</td>
<td></td>
</tr>
<tr>
<td></td>
<td>attributes: global block search link</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not classified Not classified</td>
<td></td>
</tr>
</tbody>
</table>
### $P{\_}IPTRLOCK

**Status of disable for updating the interruption pointer (OPI block InterruptionSearch) due to part program command IPTRLOCK/IPTRUNLOCK or machine data $MC{\_}AUTO{\_}IPTR\_LOCK:**

- **FALSE** (0) -> interruption pointer is updated when interruption occurs
- **TRUE** (1) -> the halt block is stored in the interruption pointer

<table>
<thead>
<tr>
<th>Description</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>$P{_}IPTRLOCK</td>
<td>Description of status</td>
</tr>
<tr>
<td></td>
<td>Status of disable for updating the interruption pointer (OPI block InterruptionSearch) due to part program command IPTRLOCK/IPTRUNLOCK or machine data $MC{_}AUTO{_}IPTR_LOCK:</td>
</tr>
<tr>
<td></td>
<td>FALSE (0) -&gt; interruption pointer is updated when interruption occurs</td>
</tr>
<tr>
<td></td>
<td>TRUE (1) -&gt; the halt block is stored in the interruption pointer</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>NCK Version</th>
</tr>
</thead>
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<tr>
<td>$P{_}IPTRLOCK</td>
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</table>

<table>
<thead>
<tr>
<th>Unit</th>
<th>run-in</th>
<th>main run</th>
<th>runin stp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>read</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>write</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

### $P{\_}DELAYFST

**Interrogation whether delay stop area is active or not depending on part program command DELAYFSTON/DelayFSTOF:**

- **FALSE** (0) -> Delay stop area is not active
- **TRUE** (1) -> Delay stop area is active

<table>
<thead>
<tr>
<th>Description</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>$P{_}DELAYFST</td>
<td>Description of status</td>
</tr>
<tr>
<td></td>
<td>Interrogation whether delay stop area is active or not depending on part program command DELAYFSTON/DelayFSTOF:</td>
</tr>
<tr>
<td></td>
<td>FALSE (0) -&gt; Delay stop area is not active</td>
</tr>
<tr>
<td></td>
<td>TRUE (1) -&gt; Delay stop area is active</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>NCK Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>$P{_}DELAYFST</td>
<td>54.00.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit</th>
<th>run-in</th>
<th>main run</th>
<th>runin stp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>read</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>write</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Attributes</th>
<th>Global</th>
<th>Block Search</th>
<th>Link</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not classified</td>
<td>Not classified</td>
<td>Not classified</td>
</tr>
</tbody>
</table>
### 1.3 Channel-specific system variables

**BOOL $AC_DELAYFST**

| description: | Interrogation in synchronized actions whether delay stop area is active or not due to part program command DELAYFSTON/DELAYFSTOFF or G331/G332.
 |
| Note: | If $AC_DELAYFST is used outside synchronized actions in the part program, then, analogous to $P_DELAYFST, the delay stop areas defined with G331/G332 cannot be interrogated owing to the restriction to motion blocks and dwell times (see $P_DELAYFST).
 |
| FALSE (0) -> Delay stop area is not active |
| TRUE (1) -> Delay stop area is active |

| axis identifier: | NCK version: 54.00.00 |
| run-in | main run | runin slip | Mrun syn | PP | SA | UPI | OEM | access rights |
| X | X | X | X |

| attributes: | global block search sink |
| Not classified |

**INT $P_MC**

| description: | Status of modal subroutine call |
| FALSE (0) -> no modal subroutine call |
| TRUE (1) -> modal subroutine call active |

| axis identifier: | NCK version: 06.00.00 |
| run-in | main run | runin slip | Mrun syn | PP | SA | UPI | OEM | access rights |
| X | X |

| attributes: | global block search sink |
| Not classified |
### 1.3 Channel-specific system variables

<table>
<thead>
<tr>
<th>INT</th>
<th>$P_\text{REPINF}$</th>
<th>Description: $P_\text{REPINF}$ Status info for repositioning with REPOS command</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FALSE (0) -&gt; Axis cannot be repositioned with REPOS command for following reasons - Call is not issued in an Asub - Call is issued by an Asub that has been started in the Reset state - Call is issued by an Asub that has been started in JOG mode TRUE (1) -&gt; Axis can be repositioned with REPOS</td>
<td></td>
</tr>
<tr>
<td>run-in</td>
<td>main run runin stp Mrun syn PP SA OPT OEM access</td>
<td></td>
</tr>
<tr>
<td>read</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>write</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>attributes</td>
<td>global block search link</td>
<td></td>
</tr>
<tr>
<td>access rights</td>
<td>Not classified</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BOOL</th>
<th>$P_\text{SIM}$</th>
<th>Description: $P_\text{SIM}$ Returns TRUE (1) if HMI simulation is running</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>NCK version: 13.00.00</td>
</tr>
<tr>
<td>run-in</td>
<td>main run runin stp Mrun syn PP SA OPT OEM access</td>
<td></td>
</tr>
<tr>
<td>read</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>write</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>attributes</td>
<td>global block search link</td>
<td></td>
</tr>
<tr>
<td>access rights</td>
<td>Not classified</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BOOL</th>
<th>$P_\text{DRYRUN}$</th>
<th>Description: $P_\text{DRYRUN}$ Returns TRUE (1) if dry run feed is selected, or else FALSE (0).</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NCK version: 06.00.00</td>
<td></td>
</tr>
<tr>
<td>run-in</td>
<td>main run runin stp Mrun syn PP SA OPT OEM access</td>
<td></td>
</tr>
<tr>
<td>read</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>write</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>attributes</td>
<td>global block search link</td>
<td></td>
</tr>
<tr>
<td>access rights</td>
<td>Not classified</td>
<td></td>
</tr>
</tbody>
</table>
### $P\_OFFN$

**Programmed contour offset**

<table>
<thead>
<tr>
<th>Description</th>
<th>NCK version:</th>
<th>17.00.00</th>
</tr>
</thead>
</table>

#### Axis Identifier

- **Unit:** -
- **Min.:** DBL_MIN
- **Max.:** DBL_MAX

#### Run-in/Read/Write

- **Run-in:** main run, runin stp, Mrun syn
- **Read:** X
- **Write:** X

#### Attributes

- **Global:** Not classified
- **Block Search:** Not classified
- **Link:** Not classified

### $\pi$

**Variable $\pi$ determines the circle constant $\pi = 3.1415927$.**

<table>
<thead>
<tr>
<th>Description</th>
<th>NCK version:</th>
<th>06.00.00</th>
</tr>
</thead>
</table>

#### Axis Identifier

- **Unit:** -
- **Min.:** 3.1415927
- **Max.:** 3.1415927

#### Run-in/Read/Write

- **Run-in:** main run, runin stp, Mrun syn
- **Read:** X
- **Write:** X

#### Attributes

- **Global:** Not classified
- **Block Search:** Not classified
- **Link:** Not classified

### $P\_PROG\_EVENT$

**System variable $P\_PROG\_EVENT$ can be used to query whether the program has been activated implicitly by an event configured with $MC\_PROG\_EVENT\_MASK$ or $MN\_SEARCH\_RUN\_MODE$.**

$P\_PROG\_EVENT$ supplies an integer value between 0 and 5 with the following meaning:

- **0:** Explicit activation by NC Start or Asub Start via VDI or Asub interface
- **1:** Implicit activation by "Part program start" event
- **2:** Implicit activation by "Part program end" event
- **3:** Implicit activation by "Operator panel reset" event
- **4:** Implicit activation by "Boot" event
- **5:** Implicit activation after output of last action block after a block search

#### Axis Identifier

- **Unit:** -
- **Min.:** 0
- **Max.:** 5

#### Run-in/Read/Write

- **Run-in:** main run, runin stp, Mrun syn
- **Read:** X
- **Write:** X

#### Attributes

- **Global:** Not classified
- **Block Search:** Not classified
- **Link:** Not classified
### STRING $P_PROGPATH

**description:**

$P_PROGPATH

Supplies the path where the program currently being processed is stored in the file system.

**Example:**

Subprogram "/_N_WKS_DIR/_N_WELLE_DIR/_N_MYSUB_SPF" is running.

$P_PROGPATH returns the string "/_N_WKS_DIR/_N_WELLE_DIR/".

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>NCK version:</th>
<th>06.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit:</td>
<td>min.:</td>
<td>max.:</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin stp</td>
</tr>
<tr>
<td>Mrun syn</td>
<td>PP</td>
<td>SA</td>
</tr>
<tr>
<td>OPI</td>
<td>OEM</td>
<td>access</td>
</tr>
<tr>
<td>read:</td>
<td>XX</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
</tr>
<tr>
<td>read:</td>
<td>Not classified</td>
<td>Not classified</td>
</tr>
<tr>
<td>write:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### STRING $P_PROG[n]

**description:**

$P_PROG[n]

Supplies the name of the program on program level n.

**Example:**

$P_PROG[0]

Supplies the name of the program on program level 0 = main program name.

**description of field limits:**

n: Defines the program level from which the program name is to be read.

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>NCK version:</th>
<th>17.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit:</td>
<td>min.:</td>
<td>max.:</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin stp</td>
</tr>
<tr>
<td>Mrun syn</td>
<td>PP</td>
<td>SA</td>
</tr>
<tr>
<td>OPI</td>
<td>OEM</td>
<td>access</td>
</tr>
<tr>
<td>read:</td>
<td>XX</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
</tr>
<tr>
<td>read:</td>
<td>Not classified</td>
<td>Not classified</td>
</tr>
<tr>
<td>write:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### $P\_STACK$

**Description:**

$P\_STACK$

Supplies the program level on which the current part program is running.

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min.</td>
<td>Max.</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
</tr>
<tr>
<td>PP</td>
<td>SA</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
</tr>
</tbody>
</table>

### $P\_ISO\_STACK$

**Description:**

$P\_ISO\_STACK$

The variable supplies the current program level in ISO mode. Unlike Siemens mode, not every subprogram or macro call changes the program level in ISO mode.

<table>
<thead>
<tr>
<th>Subprogram/macro calls and their effect on $P_ISO_STACK:</th>
</tr>
</thead>
<tbody>
<tr>
<td>M98 Pxx , subprogram call $P_ISO_STACK$ remains the same</td>
</tr>
<tr>
<td>G65 Pxx , non-modal macro $P_ISO_STACK$ is incremented</td>
</tr>
<tr>
<td>G66 Pxx , modal macro $P_ISO_STACK$ is incremented</td>
</tr>
<tr>
<td>M macro substitution $P_ISO_STACK$ is incremented</td>
</tr>
<tr>
<td>M subprogram substitution $P_ISO_STACK$ remains the same</td>
</tr>
<tr>
<td>T substitution $P_ISO_STACK$ remains the same</td>
</tr>
<tr>
<td>G substitution $P_ISO_STACK$ is incremented</td>
</tr>
</tbody>
</table>

802S/C: Value range = [0, 5]
### STRING $P\_PATH[\text{INMAXFILESTACK}]$

**description:**

$P\_PATH[n]$

Supplies the path where the program being processed on program level $n$ is stored in the file system.

**Examples:**

$P\_PATH[0]$ supplies the directory of the main program, e.g. "/_N_WKS\_DIR/_N\_WELLE\_WPD/".

$P\_PATH[\text{SP\_STACK}\ -\ 1]$ supplies the path of the calling program.

**description of field limits:**

$n$: Defines the program level from which the program path is to be read.

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>NCK version: 17.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit: -</td>
<td>min.:</td>
</tr>
<tr>
<td></td>
<td>max.:</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
</tr>
<tr>
<td>runin slip</td>
<td>Mrun syn</td>
</tr>
<tr>
<td>PP</td>
<td>SA</td>
</tr>
<tr>
<td>OPI</td>
<td>OEM</td>
</tr>
<tr>
<td>access rights</td>
<td></td>
</tr>
<tr>
<td>read: X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td></td>
</tr>
<tr>
<td>attributes: global</td>
<td>block search</td>
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<tr>
<td></td>
<td>sink</td>
</tr>
<tr>
<td></td>
<td>Not classified</td>
</tr>
<tr>
<td></td>
<td>Not classified</td>
</tr>
</tbody>
</table>

### BOOL $P\_ACTID[16]$

**description:**

Variable $P\_ACTID[n]$ determines whether the first 16 modal synchronized actions with ID $n$ are programmed.

**description of field limits:**

Index 1 - 16 corresponds to the nth modal synchronized action.

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>NCK version: 06.00.00</th>
</tr>
</thead>
<tbody>
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<td>min.: FALSE</td>
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<tr>
<td></td>
<td>max.: TRUE</td>
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<tr>
<td>run-in</td>
<td>main run</td>
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<tr>
<td>runin slip</td>
<td>Mrun syn</td>
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<tr>
<td>PP</td>
<td>SA</td>
</tr>
<tr>
<td>OPI</td>
<td>OEM</td>
</tr>
<tr>
<td>access rights</td>
<td></td>
</tr>
<tr>
<td>read: X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td></td>
</tr>
<tr>
<td>attributes: global</td>
<td>block search</td>
</tr>
<tr>
<td></td>
<td>sink</td>
</tr>
<tr>
<td></td>
<td>Not classified</td>
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<tr>
<td></td>
<td>Not classified</td>
</tr>
</tbody>
</table>
### $AC_STAT

**description:**
$AC_STAT  
-1: Invalid  
0: Channel in Reset state  
1: Channel interrupted  
2: Channel active

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>NCK version:</th>
<th>13.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit:</td>
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<tr>
<td>min.:</td>
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<tr>
<td>run-in</td>
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<td></td>
</tr>
<tr>
<td>main run</td>
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<td></td>
</tr>
<tr>
<td>runin stp</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mrun syn</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PP</td>
<td></td>
<td></td>
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<tr>
<td>SA</td>
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<tr>
<td>OPI</td>
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<tr>
<td>OEM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>access rights:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>read:</td>
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<td>block search</td>
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<tr>
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<td>Not classified</td>
</tr>
</tbody>
</table>

### $AC_PROG

**description:**
$AC_PROG  
-1: Invalid  
0: Program in Reset state  
1: Program stopped  
2: Program active  
3: Program waiting  
4: Program interrupted

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>NCK version:</th>
<th>13.00.00</th>
</tr>
</thead>
<tbody>
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<tr>
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<td>runin stp</td>
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<tr>
<td>Mrun syn</td>
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<td>PP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SA</td>
<td></td>
<td></td>
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<tr>
<td>OPI</td>
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<td></td>
</tr>
<tr>
<td>OEM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>access rights:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>read:</td>
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<td>write:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>attributes:</td>
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<td>block search</td>
</tr>
<tr>
<td></td>
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<td>Not classified</td>
</tr>
</tbody>
</table>

### $AC_SYNA_MEM

Variable $AC_SYNA_MEM determines the number of free synchronized action elements. The maximum number of elements is configured by $MC_MM_NUM_SYNC_ELEMENTS. The value is read from the part program without a preprocessing stop.

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>NCK version:</th>
<th>13.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>min.:</td>
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<td>max.: INT_MAX</td>
</tr>
<tr>
<td>run-in</td>
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<td></td>
</tr>
<tr>
<td>main run</td>
<td></td>
<td></td>
</tr>
<tr>
<td>runin stp</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mrun syn</td>
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<td>PP</td>
<td></td>
<td></td>
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<tr>
<td>SA</td>
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<td>OPI</td>
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<tr>
<td>OEM</td>
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<td></td>
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<tr>
<td>access rights:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
</tr>
<tr>
<td></td>
<td>Not classified</td>
<td>Not classified</td>
</tr>
</tbody>
</table>
### $AC_IPO_BUF

**Variable $AC_IPO_BUF** determines the current fill level of the interpolator buffer. The value is read from the part program without a preprocessing stop.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>$AC_IPO_BUF</td>
<td>Determines the current fill level of the interpolator buffer.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>NCK Version</th>
<th>Unit</th>
<th>Min.</th>
<th>Max.</th>
<th>Run-in</th>
<th>Main Run</th>
<th>Run In Stp</th>
<th>MRun Syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>$AC_IPO_BUF</td>
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</tr>
</tbody>
</table>

**Attributes:**
- Global
- Block search
- Link

**Access Rights:**
- Not classified
- Not classified

### $AC_BLOCKTYPE

**Variable $AC_BLOCKTYPE** determines the type of the current main run block. The following values are possible:

- 0: Block is programmed block (main block).
- 1: Block was generated by the system as an intermediate block.
- 2: Block was generated by chamfers/rounding
- 3: Smooth approach and retraction (SAR)
- 4: Block was generated by tool offset
- 5: Block was generated by smoothing
- 6: Block was generated by TLIFT (tangential follow-up)
- 7: Block was generated by path segmentation
- 8: Block was generated by compile cycles
- 9: Block was generated due to orientation changes on path-relative interpolation of tool orientation (ORIPATH/ORIROTC)
- 10: Block was generated by pole treatment of orientation transformations which is activated by the machine data $MC_POLE_ORI_MODE

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>$AC_BLOCKTYPE</td>
<td>Determines the type of the current main run block.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>NCK Version</th>
<th>Unit</th>
<th>Min.</th>
<th>Max.</th>
<th>Run-in</th>
<th>Main Run</th>
<th>Run In Stp</th>
<th>MRun Syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>Access Rights</th>
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<td>$AC_BLOCKTYPE</td>
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</tr>
</tbody>
</table>

**Attributes:**
- Global
- Block search
- Link

**Access Rights:**
- Not classified
- Not classified
System variable $AC_BLOCKTYPEINFO can be used to interrogate more detailed information about variable $AC_BLOCKTYPE.

Depending on the value of system variable $AC_BLOCKTYPE, various values can be returned:

1. General, internally generated block: $AC_BLOCKTYPE = 1
   $AC_BLOCKTYPEINFO = 1000 and contains no further information.
2. Chamfer/rounding: $AC_BLOCKTYPE = 2
   2001: Straight
   2002: Circle
3. SAR: $AC_BLOCKTYPE = 3
   3001: Approach with straight line
   3002: Approach with quadrant
   3003: Approach with semicircle
4. Tool compensation: $AC_BLOCKTYPE = 4
   4001: Approach block after STOPRE
   4002: Connection blocks if intersection point not found
   4003: Point-type circle on inner corners (with TRACYL only)
   4004: Bypass circle (or conical cut) at outer corners
   4005: Approach blocks with offset suppression
   4006: Approach blocks on repeated WRC activation
   4007: Block split due to excessive curvature
   4008: Compensation blocks with 3D face milling (tool vector || area vector)
5. Smoothing: $AC_BLOCKTYPE = 5
   5001: Smoothing contour by means of G641
   5002: Smoothing contour by means of G642
   5003: Smoothing contour by means of G643
   5004: Smoothing contour by means of G644
6. TLIFT: $AC_BLOCKTYPE = 6
   6001: TLIFT block with linear movement of tangential axis and without lift motion.
   6002: TLIFT block with nonlinear movement of tangential axis (polynomial) and without lift movement.
   6003: TLIFT block with lift motion, tangential axis motion and lift motion start simultaneously.
   6004: TLIFT block with lift motion, tangential axis starts first if specific lift position is reached.
7. Path segmentation: $AC_BLOCKTYPE = 7
   7001: Programmed path segmentation without active punching/nibbling
   7002: Programmed path segmentation with active punching/nibbling
   7003: Automatic, internally generated path segmentation
8. Compile cycles: $AC_BLOCKTYPE = 8
   In this case, system variable $AC_BLOCKTYPEINFO contains the ID of the compile cycles Application which created the block.
9. Path-relative interpolation of tool orientation (ORIPATH/ORIROTC)
   9000: interpolation of tool orientation (ORIPATH)
   9001: interpolation of rotation of tool (ORIROTC)
10: Pole treatment for orientstion transformations
   10000: Look ahead of position of pole axis for orientation transformations
   10001 Inserted block for traversing the pole cone at orientation transformations:
### Channel-specific system variables

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>NCK version:</th>
<th>unit:</th>
<th>min.:</th>
<th>max.:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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<td>INT_MAX</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>run-in</th>
<th>main run</th>
<th>runin stp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>read:</th>
<th>write:</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>attributes:</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>global</td>
<td>block search</td>
<td>link</td>
</tr>
<tr>
<td>Not classified</td>
<td>Not classified</td>
<td></td>
</tr>
</tbody>
</table>

#### $AC_SPLITBLOCK

**description:**
System variable $AC_SPLITBLOCK is capable of detecting all blocks generated internally and programmed blocks which were truncated as a result.

- It can return the following values:
  - $= 0$: It is an unchanged programmed block (a block generated by the compressor is viewed here as a programmed block).
  - $<> 0$: Block has been truncated or is an internally generated block, the variable can assume the following values (variable is bit-coded):
    - $= 1$: It is an internally generated block or a truncated original block
    - $= 3$: It is the last block in a chain of internally generated blocks or truncated original blocks

<table>
<thead>
<tr>
<th>axis identifier:</th>
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<th>unit:</th>
<th>min.:</th>
<th>max.:</th>
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<table>
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<tr>
<th>run-in</th>
<th>main run</th>
<th>runin stp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
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<table>
<thead>
<tr>
<th>read:</th>
<th>write:</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>attributes:</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>global</td>
<td>block search</td>
<td>link</td>
</tr>
<tr>
<td>Not classified</td>
<td>Not classified</td>
<td></td>
</tr>
</tbody>
</table>

#### $AC_TANEB

**description:**
$AC_TANEB$ determines the angle between the path tangent at the end of the current block and the path tangent at the start of the next block. This variable should only be applied to programmed main blocks. $AC_BLOCKTYPE$ can be used to determine whether the current block is a main block.

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>NCK version:</th>
<th>unit:</th>
<th>min.:</th>
<th>max.:</th>
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<tr>
<td></td>
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<td></td>
<td>-180.0</td>
<td>180.0</td>
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<table>
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<th>runin stp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
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<table>
<thead>
<tr>
<th>read:</th>
<th>write:</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X X X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>attributes:</th>
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<th></th>
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<tbody>
<tr>
<td>global</td>
<td>block search</td>
<td>link</td>
</tr>
<tr>
<td>Not classified</td>
<td>Not classified</td>
<td></td>
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</table>
### Variable $AC_SYNC_ACT_LOAD

**Description:**
Variable $AC_SYNC_ACT_LOAD supplies the current runtime for synchronized actions of the last interpolator cycle in the channel.

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>NCK Version:</th>
<th>54.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit</td>
<td>DBL_MIN</td>
<td>DBL_MAX</td>
</tr>
<tr>
<td>Read</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Write</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Attributes</td>
<td>Global</td>
<td>Block</td>
</tr>
<tr>
<td></td>
<td>Search</td>
<td>Link</td>
</tr>
</tbody>
</table>

### Variable $AC_SYNC_MAX_LOAD

**Description:**
Variable $AC_SYNC_MAX_LOAD supplies the longest runtime for synchronized actions of an interpolator cycle in the channel.

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>NCK Version:</th>
<th>54.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit</td>
<td>DBL_MIN</td>
<td>DBL_MAX</td>
</tr>
<tr>
<td>Read</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Write</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Attributes</td>
<td>Global</td>
<td>Block</td>
</tr>
<tr>
<td></td>
<td>Search</td>
<td>Link</td>
</tr>
</tbody>
</table>

### Variable $AC_SYNC_AVERAGE_LOAD

**Description:**
Variable $AC_SYNC_AVERAGE_LOAD supplies the average runtime per interpolator cycle for synchronized actions in the channel.

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>NCK Version:</th>
<th>54.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit</td>
<td>DBL_MIN</td>
<td>DBL_MAX</td>
</tr>
<tr>
<td>Read</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Write</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Attributes</td>
<td>Global</td>
<td>Block</td>
</tr>
<tr>
<td></td>
<td>Search</td>
<td>Link</td>
</tr>
</tbody>
</table>
### 1.3 Channel-specific system variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>$AC_IW_STAT</td>
<td>Variable $AC_IW_STAT describes the position information of the articulated joints (transformation-specific) for cartesian PTP travel. The variable is relevant only for transformations which support PTP.</td>
</tr>
<tr>
<td>$AC_IW_TU</td>
<td>Variable $AC_IW_TU describes the position information of the axes (MCS) for cartesian PTP travel. The variable is relevant only for transformations which support PTP.</td>
</tr>
</tbody>
</table>
| $AC_TRANS_SYS | $AC_TRANS_SYS Reference system for translation with cartesian manual travel 
0: Axis-spec. manual trav. active 
1: Cart. manual trav. in BCS 
2: Cart. manual trav. in WCS 
3: Cart. manual trav. in TCS 
Only appropriate in connection with transformations which support cart. manual travel. |

#### $AC_IW_STAT

<table>
<thead>
<tr>
<th>Description</th>
<th>NCK version: 19.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>$AC_IW_STAT describes the position information of the articulated joints (transformation-specific) for cartesian PTP travel. The variable is relevant only for transformations which support PTP.</td>
</tr>
<tr>
<td>Axis identifier</td>
<td>- min.: INT_MIN max.: INT_MAX</td>
</tr>
<tr>
<td>Run-in</td>
<td>main run runin stp Mrun syn PP SA OPT OEM access rights</td>
</tr>
<tr>
<td>Read</td>
<td>X X X X X X X</td>
</tr>
<tr>
<td>Write</td>
<td>global block search link</td>
</tr>
<tr>
<td>Attributes</td>
<td>Not classified Not classified</td>
</tr>
</tbody>
</table>

#### $AC_IW_TU

<table>
<thead>
<tr>
<th>Description</th>
<th>NCK version: 19.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>$AC_IW_TU describes the position information of the axes (MCS) for cartesian PTP travel. The variable is relevant only for transformations which support PTP.</td>
</tr>
<tr>
<td>Axis identifier</td>
<td>- min.: INT_MIN max.: INT_MAX</td>
</tr>
<tr>
<td>Run-in</td>
<td>main run runin stp Mrun syn PP SA OPT OEM access rights</td>
</tr>
<tr>
<td>Read</td>
<td>X X X X X X X</td>
</tr>
<tr>
<td>Write</td>
<td>global block search link</td>
</tr>
<tr>
<td>Attributes</td>
<td>Not classified Not classified</td>
</tr>
</tbody>
</table>

#### $AC_TRANS_SYS

<table>
<thead>
<tr>
<th>Description</th>
<th>NCK version: 46.00.00</th>
</tr>
</thead>
</table>
| Description | $AC_TRANS_SYS Reference system for translation with cartesian manual travel 
0: Axis-spec. manual trav. active 
1: Cart. manual trav. in BCS 
2: Cart. manual trav. in WCS 
3: Cart. manual trav. in TCS 
Only appropriate in connection with transformations which support cart. manual travel. |
| Axis identifier | - min.: 0 max.: 3 |
| Run-in | main run runin stp Mrun syn PP SA OPT OEM access rights |
| Read | X X X X X X X |
| Write | global block search link |
| Attributes | Not classified Not classified |
### 1 System variable

#### 1.3 Channel-specific system variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
<th>Number</th>
<th>Axis Identifier</th>
<th>Unit</th>
<th>Minimum</th>
<th>Maximum</th>
<th>NCK version</th>
<th>Access Rights</th>
<th>Read</th>
<th>Write</th>
<th>Attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>$AC_JOG_COORD$</td>
<td>Variable $AC_JOG_COORD$ is used to set the coordinate system frame for manual travel. The following values are possible: 0: Manual travel in WCS 1: Manual travel in SZS</td>
<td>1-64</td>
<td>-</td>
<td>INT</td>
<td>0</td>
<td>1</td>
<td>50.00.00</td>
<td></td>
<td>X</td>
<td>X</td>
<td>7</td>
</tr>
<tr>
<td>$AC_ROT_SYS$</td>
<td>Reference system for orientation with cartesian manual travel. 0: Axis-spec. manual trav. active 1: Cart. manual trav. in BCS 2: Cart. manual trav. in PCS 3: Cart. manual trav. in TCS Only appropriate in connection with transformations which support cart. manual travel.</td>
<td>1-64</td>
<td>-</td>
<td>INT</td>
<td>0</td>
<td>3</td>
<td>47.00.00</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>$AC_MEA[n]$</td>
<td>Probe with number $[n]$ has switched if TRUE (1)</td>
<td>1-64</td>
<td>-</td>
<td>INT_MIN</td>
<td>INT_MAX</td>
<td>13.00.00</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>
### $AC\_TRAFO

**Description:**

Code number of active transformation according to machine data $MC\_TRAFO\_TYPE_n$.

Note special meaning in the case of parameterized persistent transformation (bit 1 of $MC\_TRAFO\_MODE\_MASK$ set to 1):
The parameters of the first chained transformation are returned in the case of TRACON. 0 is returned if only the persistent transformation is active.

<table>
<thead>
<tr>
<th>Axis identifier</th>
<th>NCK version: 06.00.00</th>
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</thead>
<tbody>
<tr>
<td>Unit: -</td>
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<tr>
<td>Read: X</td>
<td>X</td>
</tr>
<tr>
<td>Write:</td>
<td>X</td>
</tr>
</tbody>
</table>

### $P\_TRAFO

**Description:**

Code number of programmed transformation according to machine data $MC\_TRAFO\_TYPE_n$.

Note special meaning in the case of parameterized persistent transformation (bit 1 of $MC\_TRAFO\_MODE\_MASK$ set to 1):
The first chained transformation is returned in the case of TRACON. 0 is returned if only the persistent transformation is active.

<table>
<thead>
<tr>
<th>Axis identifier</th>
<th>NCK version: 43.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit: -</td>
<td>INT_MIN</td>
</tr>
<tr>
<td>Read: X</td>
<td>X</td>
</tr>
<tr>
<td>Write:</td>
<td>X</td>
</tr>
</tbody>
</table>

---

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SINUMERIK 840D sl/840Di sl/ 840D/ 840Di, List of System Variables (PGA1), 01/2008
1 System variable 01/2008

1.3 Channel-specific system variables

<table>
<thead>
<tr>
<th>DOUBLE</th>
<th>$AC_TRAFO_PAR[n]</th>
<th>description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$AC_TRAFO_PAR[n]</td>
<td>Selection parameters of active transformation</td>
<td></td>
</tr>
<tr>
<td>Please note special meaning when persistent transformation is configured</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Bit 1 of $MC_TRAFO_MODE_MASK is set to 1):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The parameters of the first chained transformation are returned in the case of TRACON.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 is returned if only the persistent transformation is active.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DOUBLE</th>
<th>$P_TRAFO_PAR[n]</th>
<th>description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$P_TRAFO_PAR[n]</td>
<td>Selection parameters of programmed transformation</td>
<td></td>
</tr>
<tr>
<td>Please note special meaning when persistent transformation is configured</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Bit 1 of $MC_TRAFO_MODE_MASK is set to 1):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The parameters of the first chained transformation are returned in the case of TRACON.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 is returned if only the persistent transformation is active.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>axis identifier:</th>
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<tbody>
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<td>main run</td>
</tr>
<tr>
<td>runin</td>
<td>Mrun syn</td>
<td>PP</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
</tr>
<tr>
<td></td>
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<td>Not classified</td>
</tr>
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</table>
### 1.3 Channel-specific system variables

<table>
<thead>
<tr>
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<th>description:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$AC_TRAFO_PARSET</td>
<td>Number of active transformation data block</td>
</tr>
<tr>
<td></td>
<td>Variable is '0' is no transformation is active</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Please note special meaning when persistent transformation is configured</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Bit 1 of $MC_TRAFO_MODE_MASK is set to 1):</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The number of the data set of the first chained transformation is returned in the case of TRACON.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0 is returned if only the persistent transformation is active.</td>
<td></td>
</tr>
<tr>
<td>axis identifier:</td>
<td>-</td>
<td>NCK version: 44.00.00</td>
</tr>
<tr>
<td>unit:</td>
<td>-</td>
<td>INT_MIN</td>
</tr>
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<td>run-in run run in run in syn PP SA OPI OEM access</td>
<td>INT_MAX</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
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<td>X</td>
</tr>
<tr>
<td>attributes:</td>
<td>global block search</td>
<td>link</td>
</tr>
<tr>
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<td>Not classified</td>
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<table>
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<tr>
<th>INT</th>
<th>$P_TRAFO_PARSET</th>
<th>description:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$P_TRAFO_PARSET</td>
<td>Number of programmed transformation data block</td>
</tr>
<tr>
<td></td>
<td>Variable is '0' is no transformation is active</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Please note special meaning when persistent transformation is configured</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Bit 1 of $MC_TRAFO_MODE_MASK is set to 1):</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The number of the data set of the first chained transformation is returned in the case of TRACON.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0 is returned if only the persistent transformation is active.</td>
<td></td>
</tr>
<tr>
<td>axis identifier:</td>
<td>-</td>
<td>NCK version: 44.00.00</td>
</tr>
<tr>
<td>unit:</td>
<td>-</td>
<td>INT_MIN</td>
</tr>
<tr>
<td></td>
<td>run-in run run in run in syn PP SA OPI OEM access</td>
<td>INT_MAX</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
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<td>X</td>
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<td>attributes:</td>
<td>global block search</td>
<td>link</td>
</tr>
<tr>
<td></td>
<td>Not classified</td>
<td>Not classified</td>
</tr>
</tbody>
</table>
### $AC\_LIFTFAST

**Description:**

$AC\_LIFTFAST
Information about execution of rapid lift. 
0: Initial state. 
1: Rapid lift has been executed. 
The variable is set internally to "1" by the NC at the beginning of the rapid lift process. 
The variable must be reset to its initial state ($AC\_LIFTFAST=0) by the evaluating program (if one is configured) so that any subsequent rapid lift process can be detected again.

**Axis Identifier:** NCK version: 13.00.00

<table>
<thead>
<tr>
<th>Unit</th>
<th>run-in</th>
<th>main run</th>
<th>runin stp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>read</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>write</td>
<td>X</td>
<td>X</td>
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<td></td>
<td>X</td>
<td>X</td>
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<td>7</td>
</tr>
</tbody>
</table>

**Attributes:**

- global
- block search
- link

**Not classified**

### $P\_LIFTFAST

**Description:**

$P\_LIFTFAST
Information about execution of rapid lift. 
0: Initial state. 
1: Rapid lift has been executed. 
The variable is set internally to "1" by the NC at the beginning of the rapid lift process. 
The variable must be reset to its initial state ($AC\_LIFTFAST=0) by the evaluating program (if one is configured) so that any subsequent rapid lift process can be detected again. 
The variable is reset by writing $AC\_LIFTFAST!

**Axis Identifier:** NCK version: 44.00.00

<table>
<thead>
<tr>
<th>Unit</th>
<th>run-in</th>
<th>main run</th>
<th>runin stp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>access rights</th>
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</thead>
<tbody>
<tr>
<td>read</td>
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**Attributes:**

- global
- block search
- link

**Not classified**
1.3 Channel-specific system variables

<table>
<thead>
<tr>
<th>INT</th>
<th>$AC_ASUP</th>
<th>description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>$AC_ASUP</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Code number for the reason for activating an Asub. The reasons are bit-coded and have the following meaning:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BIT0: Activation due to: user interrupt &quot;ASUB with Bsync&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Activation by: VDI signal, digital-analog interface</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Continued by: Freely selectable Reorg or Ret</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BIT1: Activation due to: User interrupt &quot;ASUB&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>To continue the program with Repos, the position immediately prior to the interrupt is stored.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Activation by: VDI signal, digital-analog interface</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Continued by: Freely selectable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BIT2: Activation due to: user interrupt &quot;ASUB from channel state Ready&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Activation by: VDI signal, digital-analog interface</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Continued by: Freely selectable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BIT3: Activation due to: user interrupt &quot;ASUB in a manual mode and channel state not READY&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Activation by: VDI signal, digital-analog interface</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Continued by: Freely selectable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BIT4: Activation due to: Activation due to: User interrupt &quot;ASUB&quot;. To continue the program with Repos, the current position at the moment of interrupt is stored.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Activation by: VDI signal, digital-analog interface</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Continued by: Freely selectable</td>
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<tr>
<td></td>
<td></td>
<td>BIT5: Activation due to: Cancelation of subroutine repeat</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Activation by: VDI signal</td>
</tr>
<tr>
<td></td>
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<td>Continued by: Execution of system Asub REPOS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BIT6: Activation due to: Activation of decoding single block</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Activation by: VDI signal (+OPI)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Continued by: Execution of system Asub REPOS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BIT7: Activation due to: Activation of delete distance to go</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Activation by: VDI signal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Continued by: Execution of system Asub Ret</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BIT8: Activation due to: Activation of axis synchronization</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Activation by: VDI signal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Continued by: Execution of system Asub REPOS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BIT9: Activation due to: Mode change</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Activation by: VDI signal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Continued by: Execution of system Asub REPOS or RET (see MD.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BIT10: Activation due to: Program continuation under TeachIn or after TeachIn deactivation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Activation by: VDI signal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Continued by: Execution of system Asub Ret</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BIT11: Activation due to: Overstore selection</td>
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<tr>
<td></td>
<td></td>
<td>Activation by: Pi selection</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Continued by: Execution of system Asub REPOS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BIT12: Activation due to: Alarm with reaction 'offset block with Repos' ( COMPBLOCKWITHREORG)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Activation by: Internal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Continued by: Execution of system Asub REPOS</td>
</tr>
</tbody>
</table>
### 1.3 Channel-specific system variables

**BIT13**: Activation due to: Retraction with G33 and Stop  
Activation by: Internal  
Continued by: Execution of system Asub Ret

**BIT14**: Activation due to: Activation of dry run feedrate  
Activation by: Vdi

Continued by: Execution of system Asub REPOS

**BIT15**: Activation due to: Deactivation of dry run feedrate  
Activation by: Vdi

Continued by: Execution of system Asub REPOS

**BIT16**: Activation due to: Activation of block suppression  
Activation by: Vdi

Continued by: Execution of system Asub REPOS

**BIT17**: Activation due to: Deactivation of block suppression  
Activation by: Vdi

Continued by: Execution of system Asub REPOS

**BIT18**: Activation due to: Activate machine data  
Activation by: Pi

Continued by: Execution of system Asub REPOS

**BIT19**: Activation due to: Activate tool offset  
Activation by: Pi "_N_SETUDT"  
Parameter == 5

Continued by: Execution of system Asub REPOS

**BIT20**: Activation due to: System Asub after search type SERUPRO has reached the search target.  
Activation by: Pi "_N_FINDBL"  Parameter == 5

Continued by: Execution of system Asub REPOS

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>NCK version:</th>
<th>13.00.00</th>
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</thead>
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<td>max.:</td>
<td>INT_MAX</td>
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<td></td>
</tr>
<tr>
<td>runin stp Mrun syn</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PP SA OP</td>
<td>OEM access</td>
<td></td>
</tr>
<tr>
<td>read:</td>
<td>X X X  X X X X</td>
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</tr>
<tr>
<td>write:</td>
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<tr>
<td>attributes:</td>
<td>global block search link</td>
<td></td>
</tr>
<tr>
<td></td>
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**BOOL $P_{ISTEST}**

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<td>max.:</td>
<td>TRUE</td>
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<td>run-in main run</td>
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<td></td>
</tr>
<tr>
<td>runin stp Mrun syn</td>
<td></td>
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<tr>
<td>PP SA OP</td>
<td>OEM access</td>
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<tr>
<td>read:</td>
<td>X X</td>
<td></td>
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<tr>
<td>write:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>attributes:</td>
<td>global block search link</td>
<td></td>
</tr>
<tr>
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<td>Not classified Not classified</td>
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</table>

description:  
$P_{ISTEST}$  
Returns TRUE (1) if program test is active.
### 1.3 Channel-specific system variables

<table>
<thead>
<tr>
<th>STRING</th>
<th>$P_{\text{MMCA}}$</th>
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</thead>
<tbody>
<tr>
<td>description:</td>
<td>Task acknowledgement for MMC command</td>
</tr>
<tr>
<td>axis identifier:</td>
<td></td>
</tr>
<tr>
<td>unit:</td>
<td></td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
</tr>
<tr>
<td>read:</td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td></td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
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<td>Not classified</td>
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</table>

<table>
<thead>
<tr>
<th>BOOL</th>
<th>$A_{\text{PROTO}}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>description:</td>
<td>Activate / deactivate logging function for the first user. Corresponds to $A_{\text{PROTO}}[0]$.</td>
</tr>
<tr>
<td>axis identifier:</td>
<td></td>
</tr>
<tr>
<td>unit:</td>
<td></td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
</tr>
<tr>
<td>read:</td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td></td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
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</table>

<table>
<thead>
<tr>
<th>BOOL</th>
<th>$A_{\text{PROTO}}[\text{EX_MAX_NUM_PROT_USER}]$</th>
</tr>
</thead>
<tbody>
<tr>
<td>description:</td>
<td>Activate / deactivate logging function for a user. Corresponds to OPI variable protocUserActive.</td>
</tr>
<tr>
<td>description of field limits:</td>
<td>Index of the user of the logging function.</td>
</tr>
<tr>
<td>axis identifier:</td>
<td></td>
</tr>
<tr>
<td>unit:</td>
<td></td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
</tr>
<tr>
<td>read:</td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td></td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
</tr>
<tr>
<td></td>
<td>Not classified</td>
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</table>
### 1.3 Channel-specific system variables

#### BOOL

**$A_PROT_LOCK[EX_MAX_NUM_P\_ROT\_USER]**

<table>
<thead>
<tr>
<th>Description:</th>
<th>Disable / enable logging function temporarily for a user</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field limits:</td>
<td>0 - EX_MAX_NUM_P_ROT_USER-1, USER</td>
</tr>
<tr>
<td>Axis identifier:</td>
<td>NCK version: 51.04.00</td>
</tr>
<tr>
<td>Unit:</td>
<td>Run-in  Main run  Run-in slip  Mrun syn  PP  SA  OPT  OEM  Access  Rights  Read:  X  X  X  X  X  X  X  X  Write:  X  X  X  X  X  X  X</td>
</tr>
<tr>
<td>Attributes:</td>
<td>Global  Block  Search  Link  Not classified  Not classified</td>
</tr>
</tbody>
</table>

#### DOUBLE

**$AC\_FIFO1[n]**

Variable $AC\_FIFO1[n]$ is a stack with first in first out characteristics. This stack memory can be used for cyclic measuring operations.

$MC\_NUM\_AC\_FIFO$ is used to define the number of FIFO variables $AC\_FIFO1 - AC\_FIFO10$.

The elements of the stack memory are saved in R variables. The length of all FIFO variables is configured with $MC\_LEN\_AC\_FIFO$.

$MC\_START\_AC\_FIFO$ is used to specify the number of the start R variable, from which the FIFO elements are stored.

R variables assigned to FIFO areas should not be written elsewhere.

The number of R variables must be set in machine data $MC\_MM\_NUM\_R\_PARAM$ such that all FIFO variables can be accommodated:

$MC\_MM\_NUM\_R\_PARAM = MC\_MM\_START\_FIFO + MC\_NUM\_AC\_FIFO * (MC\_LEN\_AC\_FIFO + 6)$

The FIFO variable is an array variable.

Indices 0 - 5 have special meanings:

n = 0: When written with index 0, a new value is stored in the FIFO. When read with index 0, the oldest element is read and removed from the FIFO.

n=1: Access to the first element read
n=2: Access to the second element read
n=3: Total of all FIFO elements if Bit0 in $MC\_MM\_MODE\_FIFO$ is set.

n=4: Number of elements available in the FIFO
n=5: Current write index relative to the start of the FIFO
n=6: Oldest element
n=7: Second oldest etc.

Field limits: The dimension is defined in $MC\_LEN\_AC\_FIFO$.

| Description: | Variable $AC\_FIFO1[n]$ is a stack with first in first out characteristics. This stack memory can be used for cyclic measuring operations. $MC\_NUM\_AC\_FIFO$ is used to define the number of FIFO variables $AC\_FIFO1 - AC\_FIFO10$. The elements of the stack memory are saved in R variables. The length of all FIFO variables is configured with $MC\_LEN\_AC\_FIFO$. $MC\_START\_AC\_FIFO$ is used to specify the number of the start R variable, from which the FIFO elements are stored. R variables assigned to FIFO areas should not be written elsewhere. The number of R variables must be set in machine data $MC\_MM\_NUM\_R\_PARAM$ such that all FIFO variables can be accommodated: $MC\_MM\_NUM\_R\_PARAM = MC\_MM\_START\_FIFO + MC\_NUM\_AC\_FIFO * (MC\_LEN\_AC\_FIFO + 6)$ The FIFO variable is an array variable. Indices 0 - 5 have special meanings: n = 0: When written with index 0, a new value is stored in the FIFO. When read with index 0, the oldest element is read and removed from the FIFO. n=1: Access to the first element read n=2: Access to the second element read n=3: Total of all FIFO elements if Bit0 in $MC\_MM\_MODE\_FIFO$ is set. n=4: Number of elements available in the FIFO n=5: Current write index relative to the start of the FIFO n=6: Oldest element n=7: Second oldest etc. |
| Axis identifier: | NCK version: 13.00.00 |
| Unit: | Run-in  Main run  Run-in slip  Mrun syn  PP  SA  OPT  OEM  Access  Rights  Read:  X  X  X  X  X  X  X  X  Write:  X  X  X  X  X  X  X  |
| Attributes: | Global  Block  Search  Link  Not classified  Not classified |
## 1.3 Channel-specific system variables

**DOUBLE**\ $\texttt{\$AC_FIFO2[n]}$

<table>
<thead>
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</tr>
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<tbody>
<tr>
<td>Variable $\texttt{$AC_FIFO2[n]}$ is a stack with first in first out characteristics. This stack memory can be used for cyclic measuring operations. $\texttt{$MC_NUM_AC_FIFO}$ is used to define the number of FIFO variables $\texttt{$AC_FIFO1 - $AC_FIFO10}$. The elements of the stack memory are saved in R variables. The length of all FIFO variables is configured with $\texttt{$MC_LEN_AC_FIFO}$. $\texttt{$MC_START_AC_FIFO}$ is used to specify the number of the start R variable, from which the FIFO elements are stored. R variables assigned to FIFO areas should not be written elsewhere. The number of R variables must be set in machine data $\texttt{$MC_MM_NUM_R_PARAM}$ such that all FIFO variables can be accommodated: $\texttt{$MC_MM_NUM_R_PARAM} = \texttt{$MC_MM_START_FIFO + $MC_NUM_AC_FIFO * ($MC_LEN_AC_FIFO + 6)}$. The FIFO variable is an array variable. Indices 0 - 5 have special meanings: n = 0: When written with index 0, a new value is stored in the FIFO. When read with index 0, the oldest element is read and removed from the FIFO. n=1: Access to the first element read n=2: Access to the second element read n=3: Total of all FIFO elements if Bit0 in $\texttt{$MC_MM_MODE_FIFO}$ is set. n=4: Number of elements available in the FIFO n=5: Current write index relative to the start of the FIFO n=6: Oldest element n=7: Second oldest etc. The dimension is defined in $\texttt{$MC_LEN_AC_FIFO}$.</td>
</tr>
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<table>
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<tr>
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<td>min.: DBL_MIN</td>
<td>max.: DBL_MAX</td>
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<tr>
<td>run-in</td>
<td>main run</td>
<td>runin stp</td>
</tr>
<tr>
<td>read:</td>
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<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
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SINUMERIK 840D sl/840Di sl/ 840D/ 840Di, List of System Variables (PGA1), 01/2008
### DOUBLE $AC_FIFO3[n]$

<table>
<thead>
<tr>
<th>description:</th>
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<tbody>
<tr>
<td>Variable $AC_FIFO3[n]$ is a stack with first in first out characteristics. This stack memory can be used for cyclic measuring operations. $MC_NUM_AC_FIFO$ is used to define the number of FIFO variables $AC_FIFO1 - AC_FIFO10$. The elements of the stack memory are saved in R variables. The length of all FIFO variables is configured with $MC_LEN_AC_FIFO$. $MC_START_AC_FIFO$ is used to specify the number of the start R variable, from which the FIFO elements are stored.</td>
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<table>
<thead>
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<th>n:</th>
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<tr>
<td>description of field limits:</td>
</tr>
<tr>
<td>The dimension is defined in $MC_LEN_AC_FIFO$.</td>
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<thead>
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<th>axis identifier:</th>
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<tbody>
<tr>
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<td>main run</td>
<td>runin stp</td>
</tr>
<tr>
<td>read:</td>
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<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td>X</td>
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<table>
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<tr>
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<th>link</th>
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</thead>
<tbody>
<tr>
<td>global</td>
<td>Not classified</td>
<td>Not classified</td>
</tr>
</tbody>
</table>
1.3 Channel-specific system variables

DOUBLE $AC_FIFO4[n]

description:
Variable $AC_FIFO4[n] is a stack with first in first out characteristics. This stack memory can be used for cyclic measuring operations. $MC_NUM_AC_FIFO is used to define the number of FIFO variables $AC_FIFO1 - $AC_FIFO10. The elements of the stack memory are saved in R variables. The length of all FIFO variables is configured with $MC_LEN_AC_FIFO.

$MC_START_AC_FIFO is used to specify the number of the start R variable, from which the FIFO elements are stored.

R variables assigned to FIFO areas should not be written elsewhere. The number of R variables must be set in machine data $MC_MM_NUM_R_PARAM such that all FIFO variables can be accommodated:

$MC_MM_NUM_R_PARAM = $MC_MM_START_FIFO + $MC_NUM_AC_FIFO * ($MC_LEN_AC_FIFO + 6)

The FIFO variable is an array variable. Indices 0 - 5 have special meanings:

n = 0: When written with index 0, a new value is stored in the FIFO. When read with index 0, the oldest element is read and removed from the FIFO.
n=1: Access to the first element read
n=2: Access to the second element read
n=3: Total of all FIFO elements if Bit0 in $MC_MM_MODE_FIFO is set.
n=4: Number of elements available in the FIFO
n=5: Current write index relative to the start of the FIFO
n=6: Oldest element
n=7: Second oldest etc.

description of field limits:
The dimension is defined in $MC_LEN_AC_FIFO.

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<tr>
<td>unit:</td>
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<td>max.:</td>
</tr>
<tr>
<td>run-in main run runin slp Mrun syn PP SA OPI OEM access rights</td>
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<tr>
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<td>write: X X X X X X X 7</td>
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<td>attributes: global block search link</td>
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</table>

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SINUMERIK 840D sl/840Di sl/ 840D/ 840Di, List of System Variables (PGA1), 01/2008
Variable $AC_FIFO5[n]$ is a stack with first in first out characteristics. This stack memory can be used for cyclic measuring operations.

$MC_NUM_AC_FIFO$ is used to define the number of FIFO variables $AC_FIFO1$ - $AC_FIFO10$. The elements of the stack memory are saved in R variables. The length of all FIFO variables is configured with $MC_LEN_AC_FIFO$.

$MC_START_AC_FIFO$ is used to specify the number of the start R variable, from which the FIFO elements are stored.

R variables assigned to FIFO areas should not be written elsewhere. The number of R variables must be set in machine data $MC_MM_NUM_R_PARAM$ such that all FIFO variables can be accommodated:

$$MC_MM_NUM_R_PARAM = MC_MM_START_FIFO + MC_NUM_AC_FIFO \times (MC_LEN_AC_FIFO + 6)$$

The FIFO variable is an array variable. Indices 0 - 5 have special meanings:

- **n = 0**: When written with index 0, a new value is stored in the FIFO.
- **n = 1**: Access to the first element read
- **n = 2**: Access to the second element read
- **n = 3**: Total of all FIFO elements if Bit0 in $MC_MM_MODE_FIFO$ is set.
- **n = 4**: Number of elements available in the FIFO
- **n = 5**: Current write index relative to the start of the FIFO
- **n = 6**: Oldest element
- **n = 7**: Second oldest etc.

The dimension is defined in $MC_LEN_AC_FIFO$.

---

<table>
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<tr>
<th>axis identifier:</th>
<th>unit:</th>
<th>min.:</th>
<th>max.:</th>
<th>NCK version:</th>
<th>access rights</th>
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<td>runin stop</td>
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</tr>
<tr>
<td>Mrun syn</td>
<td>OPI</td>
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<tr>
<td>read:</td>
<td>OEM</td>
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<td>write:</td>
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**description of field limits:**

The dimension is defined in $MC_LEN_AC_FIFO$.

**attributes:**

- global
- block search
- link
- Not classified

**Not classified:**

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<thead>
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<th>read:</th>
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<th>attributes:</th>
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<tr>
<td>X</td>
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<tr>
<td>X</td>
<td>X</td>
<td>block search</td>
</tr>
<tr>
<td>X</td>
<td>X</td>
<td>link</td>
</tr>
<tr>
<td>X</td>
<td></td>
<td>Not classified</td>
</tr>
</tbody>
</table>
1.3 Channel-specific system variables

**DOUBLE $AC_FIFO6[n]$**

**description:**
Variable $AC_FIFO6[n]$ is a stack with first in first out characteristics. This stack memory can be used for cyclic measuring operations.

$MC_NUM_AC_FIFO$ is used to define the number of FIFO variables $AC_FIFO1 - AC_FIFO10$. The elements of the stack memory are saved in R variables. The length of all FIFO variables is configured with $MC_LEN_AC_FIFO$.

$MC_START_AC_FIFO$ is used to specify the number of the start R variable, from which the FIFO elements are stored.

R variables assigned to FIFO areas should not be written elsewhere.

The number of R variables must be set in machine data $MC_MM_NUM_R_PARAM$ such that all FIFO variables can be accommodated:

$MC_MM_NUM_R_PARAM = MC_MM_START_FIFO + MC_NUM_AC_FIFO \times (MC_LEN_AC_FIFO + 6)$

The FIFO variable is an array variable.

Indices 0 - 5 have special meanings:

- n = 0: When written with index 0, a new value is stored in the FIFO.
  - When read with index 0, the oldest element is read and removed from the FIFO.
- n=1: Access to the first element read
- n=2: Access to the second element read
- n=3: Total of all FIFO elements if Bit0 in $MC_MM_MODE_FIFO$ is set.
- n=4: Number of elements available in the FIFO
- n=5: Current write index relative to the start of the FIFO
- n=6: Oldest element
- n=7: Second oldest etc.

**description of field limits:**
The dimension is defined in $MC_LEN_AC_FIFO$.

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>NCK version:</th>
<th>13.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit: -</td>
<td>DBL_MIN</td>
<td>DBL_MAX</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin stp</td>
</tr>
<tr>
<td>read: X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write: X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

attributes: global block search link

Not classified Not classified
### Variable Description

**$AC_FIFO7[n]$**

**Description:**
Variable $AC_FIFO7[n]$ is a stack with first in first out characteristics. This stack memory can be used for cyclic measuring operations.

$MC_NUM_AC_FIFO$ is used to define the number of FIFO variables $AC_FIFO1 - AC_FIFO10$.

The elements of the stack memory are saved in R variables. The length of all FIFO variables is configured with $MC_LEN_AC_FIFO$.

$MC_START_AC_FIFO$ is used to specify the number of the start R variable, from which the FIFO elements are stored.

R variables assigned to FIFO areas should not be written elsewhere.

The number of R variables must be set in machine data $MC_MM_NUM_R_PARAM$ such that all FIFO variables can be accommodated:

$$MC_MM_NUM_R_PARAM = MC_MM_START_FIFO + MC_NUM_AC_FIFO \times (MC_LEN_AC_FIFO + 6)$$

The FIFO variable is an array variable.

Indices 0 - 5 have special meanings:
- **n = 0:** When written with index 0, a new value is stored in the FIFO.
- **n = 1:** Access to the first element read
- **n = 2:** Access to the second element read
- **n = 3:** Total of all FIFO elements if Bit0 in $MC_MM_MODE_FIFO$ is set.
- **n = 4:** Number of elements available in the FIFO
- **n = 5:** Current write index relative to the start of the FIFO
- **n = 6:** Oldest element
- **n = 7:** Second oldest etc.

**Description of Field Limits:**
The dimension is defined in $MC_LEN_AC_FIFO$.

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>NCK version: 13.00.00</th>
<th>unit: - run-in main run runin stop Mrun syn PP SA OPI OEM access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>read:</td>
<td>X X X X X X X X</td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td>X X X X X X</td>
<td></td>
</tr>
</tbody>
</table>

**Attributes:**
- **global**
- **block**
- **search**
- **link**

**Not classified**
Variable $AC_FIFO8[n]$ is a stack with first in first out characteristics. This stack memory can be used for cyclic measuring operations.

$MC_NUM_AC_FIFO$ is used to define the number of FIFO variables $AC_FIFO1 - AC_FIFO10$. The elements of the stack memory are saved in R variables. The length of all FIFO variables is configured with $MC_LEN_AC_FIFO$.

$MC_START_AC_FIFO$ is used to specify the number of the start R variable, from which the FIFO elements are stored.

R variables assigned to FIFO areas should not be written elsewhere. The number of R variables must be set in machine data $MC_MM_NUM_R_PARAM$ such that all FIFO variables can be accommodated:

$$MC_MM_NUM_R_PARAM = MC_MM_START_FIFO + MC_NUM_AC_FIFO \times (MC_LEN_AC_FIFO + 6)$$

The FIFO variable is an array variable. Indices 0 - 5 have special meanings:

- n = 0: When written with index 0, a new value is stored in the FIFO.
- When read with index 0, the oldest element is read and removed from the FIFO.
- n=1: Access to the first element read
- n=2: Access to the second element read
- n=3: Total of all FIFO elements if Bit0 in $MC_MM_MODE_FIFO$ is set.
- n=4: Number of elements available in the FIFO
- n=5: Current write index relative to the start of the FIFO
- n=6: Oldest element
- n=7: Second oldest etc.

The dimension is defined in $MC_LEN_AC_FIFO$.

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>NCK version:</th>
<th>13.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit:</td>
<td>run-in</td>
<td>main run</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

description of field limits:

- The dimension is defined in $MC_LEN_AC_FIFO$.
### Variable $AC\_FIFO9[n]$

- **Description:**
  - Variable $AC\_FIFO9[n]$ is a stack with first in first out characteristics. This stack memory can be used for cyclic measuring operations.
  - $MC\_NUM\_AC\_FIFO$ is used to define the number of FIFO variables $AC\_FIFO1$ - $AC\_FIFO10$.
  - The elements of the stack memory are saved in R variables. The length of all FIFO variables is configured with $MC\_LEN\_AC\_FIFO$.
  - $MC\_START\_AC\_FIFO$ is used to specify the number of the start R variable, from which the FIFO elements are stored.
  - R variables assigned to FIFO areas should not be written elsewhere.
  - The number of R variables must be set in machine data $MC\_MM\_NUM\_R\_PARAM$ such that all FIFO variables can be accommodated:
    \[
    MC\_MM\_NUM\_R\_PARAM = MC\_MM\_START\_FIFO + MC\_NUM\_AC\_FIFO \times (MC\_LEN\_AC\_FIFO + 6)
    \]
  - The FIFO variable is an array variable.
  - Indices 0 - 5 have special meanings:
    - $n = 0$: When written with index 0, a new value is stored in the FIFO.
    - When read with index 0, the oldest element is read and removed from the FIFO.
    - $n=1$: Access to the first element read
    - $n=2$: Access to the second element read
    - $n=3$: Total of all FIFO elements if Bit0 in $MC\_MM\_MODE\_FIFO$ is set.
    - $n=4$: Number of elements available in the FIFO
    - $n=5$: Current write index relative to the start of the FIFO
    - $n=6$: Oldest element
    - $n=7$: Second oldest etc.

- **Dimension:**
  - The dimension is defined in $MC\_LEN\_AC\_FIFO$.

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>NCK version: 13.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>DBL_MIN</td>
</tr>
<tr>
<td>main run</td>
<td>max.: DBL_MAX</td>
</tr>
<tr>
<td>runin stp</td>
<td>PP</td>
</tr>
<tr>
<td>Mrun syn</td>
<td>SA</td>
</tr>
<tr>
<td>PP</td>
<td>OPI</td>
</tr>
<tr>
<td>SA</td>
<td>OEM</td>
</tr>
<tr>
<td>access rights</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>read:</th>
<th>write:</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>X</td>
<td>X</td>
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<tr>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>attributes:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>global</td>
<td>block search</td>
</tr>
<tr>
<td></td>
<td>link</td>
</tr>
</tbody>
</table>

| Not classified  | Not classified       |

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SINUMERIK 840D sl/840Di sl/ 840D/ 840Di, List of System Variables (PGA1), 01/2008
### 1.3 Channel-specific system variables

**DOUBLE $AC_FIFO10[n]$**

| description: |
| Variable $AC_FIFO10[n]$ is a stack with first in first out characteristics. This stack memory can be used for cyclic measuring operations. |

**$MC_NUM_AC_FIFO$** is used to define the number of FIFO variables $AC_FIFO1 - AC_FIFO10$. The elements of the stack memory are saved in R variables. The length of all FIFO variables is configured with $MC_LEN_AC_FIFO$.

**$MC_START_AC_FIFO$** is used to specify the number of the start R variable, from which the FIFO elements are stored.

R variables assigned to FIFO areas should not be written elsewhere. The number of R variables must be set in machine data $MC_MM_NUM_R_PARAM$ such that all FIFO variables can be accommodated:

$$MC_MM_NUM_R_PARAM = MC_MM_START_FIFO + MC_NUM_AC_FIFO * (MC_LEN_AC_FIFO + 6)$$

The FIFO variable is an array variable. Indices 0 - 5 have special meanings:

- n = 0: When written with index 0, a new value is stored in the FIFO. When read with index 0, the oldest element is read and removed from the FIFO.
- n = 2: Access to the second element read
- n = 3: Total of all FIFO elements if Bit0 in $MC_MM_MODE_FIFO$ is set.
- n = 4: Number of elements available in the FIFO
- n = 5: Current write index relative to the start of the FIFO
- n = 7: Second oldest etc.

**description of field limits:**

The dimension is defined in $MC_LEN_AC_FIFO$.

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>NCK version: 13.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit:</td>
<td>DBL_MIN</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
</tr>
<tr>
<td>read:</td>
<td>X X X</td>
</tr>
<tr>
<td>write:</td>
<td>X X</td>
</tr>
<tr>
<td>attributes:</td>
<td>global block search</td>
</tr>
</tbody>
</table>

**BOOL $A_IN[n]$**

| description: |
| Variable $A_IN[n]$ is used to interrogate digital inputs. |

**description of field limits:**

The dimension is defined in $MN_FASTIO_DIG_NUM_INPUTS$.

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>NCK version: 06.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit:</td>
<td>FALSE</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
</tr>
<tr>
<td>read:</td>
<td>X X X</td>
</tr>
<tr>
<td>write:</td>
<td>X X</td>
</tr>
<tr>
<td>attributes:</td>
<td>global block search</td>
</tr>
</tbody>
</table>

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SINUMERIK 840D sl/840Di sl/ 840D/ 840Di, List of System Variables (PGA1), 01/2008
### BOOL $A_OUT[n]

**Description:**
Variable $A_OUT[n]$ is used to interrogate digital outputs.

**Description of Field Limits:**
The dimension is defined in $MN_FASTIO_DIG_NUM_OUTPUTS$.

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>NCK Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>06.00.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Run-in</th>
<th>Main Run</th>
<th>Runin Stop</th>
<th>MRun Sync</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FALSE</td>
<td>TRUE</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

| Write |          |          | X      | X        | X          | X         | X  | X  | X   | X   |                |

**Attributes:**
- Global
- Block
- Search
- Link

- Not classified
- Not classified

### DOUBLE $A_INA[n]

**Description:**
Variable $A_INA[n]$ is used to access the analog inputs.

**Description of Field Limits:**
The dimension is defined in $MN_FASTIO_ANA_NUM_INPUTS$.

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>NCK Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>06.00.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Run-in</th>
<th>Main Run</th>
<th>Runin Stop</th>
<th>MRun Sync</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DBL_MIN</td>
<td>DBL_MAX</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

| Write |          |          | X      | X        | X          | X         | X  | X  | X   | X   |                |

**Attributes:**
- Global
- Block
- Search
- Link

- Not classified
- Not classified

### DOUBLE $A_OUTA[n]

**Description:**
Variable $A_OUTA[n]$ is used to access the analog outputs. When written the value does not become operative until the next interpolator cycle and can then be read back.

**Description of Field Limits:**
The dimension is defined in $MN_FASTIO_ANA_NUM_OUTPUTS$.

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>NCK Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>06.00.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Run-in</th>
<th>Main Run</th>
<th>Runin Stop</th>
<th>MRun Sync</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DBL_MIN</td>
<td>DBL_MAX</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

| Write |          |          | X      | X        | X          | X         | X  | X  | X   | X   |                |

**Attributes:**
- Global
- Block
- Search
- Link

- Not classified
- Not classified
### BOOL $A\_INCO[2]$

<table>
<thead>
<tr>
<th>Description:</th>
<th>Variable $A_INCO[n]$ is used to access the comparator inputs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description of field limits:</td>
<td>nth comparator input.</td>
</tr>
<tr>
<td>Axis identifier:</td>
<td>NCK version: 06.00.00</td>
</tr>
<tr>
<td>Unit:</td>
<td>run-in main run runin slip Mrun sync PP SA OPT OEM access rights</td>
</tr>
<tr>
<td>Read:</td>
<td>X X X X</td>
</tr>
<tr>
<td>Write:</td>
<td>X X X X</td>
</tr>
<tr>
<td>Attributes:</td>
<td>global block search link</td>
</tr>
<tr>
<td>Not classified</td>
<td>Not classified</td>
</tr>
</tbody>
</table>

### INT $A\_DBB[1024]$

| Description: | Array variable $A\_DBB[n]$ is used to read and write a data byte (8 bits) from PLC. The byte is unsigned and can be read in the range from 0 to 255 and written in the range from -128 to 255. A memory area is reserved in the communications buffer of these modules (DPR) for high-speed data exchange between PLC and NC. The PLC uses function calls (FC) and the NCK uses $ variables to access this memory. See also $A\_DBSB[n]$. |
| Description of field limits: | n: Position offset within I/O area 0 - ... |
| Axis identifier: | NCK version: 13.00.00 |
| Unit: | run-in main run runin slip Mrun sync PP SA OPT OEM access rights |
| Read: | X X X |
| Write: | X X X |
| Attributes: | global block search link |
| Not classified | Not classified |
### Array variable $A_DBW[n]$

Array variable $A_DBW[n]$ is used to read and write a data word (16 bits) from PLC. The byte is unsigned and can be read in the range from 0 to 65535 and written in the range from -32768 to 65535. A memory area is reserved in the communications buffer of these modules (DPR) for high-speed data exchange between PLC and NC. The PLC uses function calls (FC) and the NCK uses $ variables to access this memory.

See also $A_DBSW[n]$.

<table>
<thead>
<tr>
<th>n: Position offset within I/O area 0 - ...</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCK version: 13.00.00</td>
</tr>
<tr>
<td>unit: - min.: -32768 max.: 65535</td>
</tr>
<tr>
<td>read: X X X X X X</td>
</tr>
<tr>
<td>write: X X X X X X</td>
</tr>
<tr>
<td>attributes: global block search link</td>
</tr>
<tr>
<td>Not classified Not classified</td>
</tr>
</tbody>
</table>

### Array variable $A_DBD[n]$

Array variable $A_DBD[n]$ is used to read and write a data doubleword (32 bits) from PLC. A memory area is reserved in the communications buffer of these modules (DPR) for high-speed data exchange between PLC and NC. The PLC uses function calls (FC) and the NCK uses $ variables to access this memory.

<table>
<thead>
<tr>
<th>n: Position offset within I/O area 0 - ...</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCK version: 13.00.00</td>
</tr>
<tr>
<td>unit: - min.: INT_MIN max.: INT_MAX</td>
</tr>
<tr>
<td>read: X X X X X X</td>
</tr>
<tr>
<td>write: X X X X X X</td>
</tr>
<tr>
<td>attributes: global block search link</td>
</tr>
<tr>
<td>Not classified Not classified</td>
</tr>
</tbody>
</table>
1.3 Channel-specific system variables

**DOUBLE $A_DBR[1024]$**

| Description: | Array variable $A_DBR[n]$ is used to read and write Real data (32 bits) from PLC. A memory area is reserved in the communications buffer of these modules (DPR) for high-speed data exchange between PLC and NC. The PLC uses function calls (FC) and the NCK uses $ variables to access this memory. |
|---------------------------------------------------------------|
| Description of field limits: | n: Position offset within I/O area 0 - ... |
| Axis identifier: | NCK version: 13.00.00 |
| Unit: | MIN: DBL_MIN | MAX: DBL_MAX |
| Run-in | Main run | Run-in slip | Mrun syn | PP | SA | OPT | OEM | Access rights |
| Read: | X | X | X | X | X | X | X | |
| Write: | X | X | X | X | X | X | X | 7 |
| Attributes: | Global | Block search | Link |
| Not classified | Not classified |

**INT $A_DLB[n]$**

| Description: | Variable $A_DLB[n]$ enables reading and writing of a data byte (8 bits) which can be transmitted to other channels or NCUs across the NCU link. $MC_MM_NUM_LINKVAR_ELEMENTS$ is used to define the number of elements available to the user for programming link variables ($A_DLx$). The negative value range of this variable applies to write operations only. The variable can thus store negative values. Only the corresponding positive value can be read back. |
|---------------------------------------------------------------|
| Description of field limits: | The dimension is defined in $MC_MM_SIZEOF_LINKVAR_DATA$. |
| Axis identifier: | NCK version: 14.00.00 |
| Unit: | MIN: -128 | MAX: 255 |
| Run-in | Main run | Run-in slip | Mrun syn | PP | SA | OPT | OEM | Access rights |
| Read: | X | X | X | X | X | X | X | |
| Write: | X | X | X | X | X | X | X | 7 |
| Attributes: | Global | Block search | Link |
| Not classified | Not classified |
### Channel-specific system variables

#### Variable $A_DLW[n]$

**Description:**
Variable $A_DLW[n]$ enables reading and writing of a data word (16 bits) which can be transmitted to other channels or NCUs across the NCU link.

$MC_MM_NUM_LINKVAR_ELEMENTS$ is used to define the number of elements available to the user for programming link variables ($A_DLx$).

The negative value range of this variable applies to write operations only. The variable can thus store negative values. Only the corresponding positive value can be read back.

**Description of field limits:**
The dimension is defined in $MC_MM_SIZEOF_LINKVAR_DATA$.

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>NCK version: 14.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit:</td>
<td>- min.: -32768 max.: 65535</td>
</tr>
<tr>
<td>run-in main run</td>
<td></td>
</tr>
<tr>
<td>read:</td>
<td>X X X XX X X X X</td>
</tr>
<tr>
<td>write:</td>
<td>X X X X X X X 7</td>
</tr>
<tr>
<td>attributes:</td>
<td>global block search link</td>
</tr>
<tr>
<td>access rights:</td>
<td>Not classified Not classified</td>
</tr>
</tbody>
</table>

#### Variable $A_DLD[n]$

**Description:**
Variable $A_DLD[n]$ enables reading and writing of a data doubleword (32 bits) which can be transmitted to other channels or NCUs across the NCU link.

$MC_MM_NUM_LINKVAR_ELEMENTS$ is used to define the number of elements available to the user for programming link variables ($A_DLx$).

**Description of field limits:**
The dimension is defined in $MC_MM_SIZEOF_LINKVAR_DATA$.

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>NCK version: 14.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit:</td>
<td>- min.: INT_MIN max.: INT_MAX</td>
</tr>
<tr>
<td>run-in main run</td>
<td></td>
</tr>
<tr>
<td>read:</td>
<td>X X X X X X X X</td>
</tr>
<tr>
<td>write:</td>
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### 1.3 Channel-specific system variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>$A_DLR[n]$</td>
<td>Variable $A_DLR[n]$ enables reading and writing of a Real value which can be transmitted to other channels or NCUs across the NCU link. $MC_MM_NUM_LINKVAR_ELEMENTS$ is used to define the number of elements available to the user for programming link variables ($A_DLx$). The dimension is defined in $MC_MM_SIZEOF_LINKVAR_DATA$.</td>
</tr>
<tr>
<td>$A_LINK_TRANS_RATE$</td>
<td>Variable $A_LINK_TRANS_RATE$ determines the number of bytes which can still be transferred by NCU link in the current interpolation cycle.</td>
</tr>
<tr>
<td>$A_PBB_IN[32]$</td>
<td>Array variable $A_PBB_IN[n]$ is used to read and write a data byte (8 bits) from the PLC I/O. The dimension is defined in $MN_PLCIO_NUM_BYTES_IN$.</td>
</tr>
</tbody>
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#### $A_DLR[n]$ variable

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<th>Type</th>
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<td>runin slip</td>
<td>Mrun syn</td>
<td>PP</td>
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<tr>
<td>read:</td>
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<td>X</td>
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<td>X</td>
</tr>
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<td>write:</td>
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<td>PP</td>
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<td>read:</td>
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#### $A_PBB_IN[32]$ variable

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<td>runin slip</td>
<td>Mrun syn</td>
<td>PP</td>
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<tr>
<td>read:</td>
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SINUMERIK 840D sl/840Di sl/ 840D/ 840Di, List of System Variables (PGA1), 01/2008

1-87
### $A_{PBW\_IN}[32]$

**Description:**
Array variable $A_{PBW\_IN}[n]$ is used to read and write a data word (16 bits) from the PLC I/O.

**Description of field limits:**
The dimension is defined in $MN\_PLCIO\_NUM\_BYTES\_IN$.

**Axis identifier:**
NCK version: 16.00.00

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<tr>
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<th>Main Run</th>
<th>Runin Stop</th>
<th>Mrun Stop</th>
<th>PP</th>
<th>SA</th>
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**Attributes:**
- Global
- Block
- Search
- Link

### $A_{PBD\_IN}[32]$

**Description:**
Array variable $A_{PBD\_IN}[n]$ is used to read a data doubleword (32 bits) from the PLC I/O.

**Description of field limits:**
The dimension is defined in $MN\_PLCIO\_NUM\_BYTES\_IN$.

**Axis identifier:**
NCK version: 16.00.00

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<th>Main Run</th>
<th>Runin Stop</th>
<th>Mrun Stop</th>
<th>PP</th>
<th>SA</th>
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<td>X</td>
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**Attributes:**
- Global
- Block
- Search
- Link

### $A_{PBR\_IN}[32]$

**Description:**
Array variable $A_{PBR\_IN}[n]$ is used to read Real data (32 bits) from the PLC I/O.

**Description of field limits:**
The dimension is defined in $MN\_PLCIO\_NUM\_BYTES\_IN$.

**Axis identifier:**
NCK version: 16.00.00

<table>
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<th>Max.</th>
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<tr>
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<th>Main Run</th>
<th>Runin Stop</th>
<th>Mrun Stop</th>
<th>PP</th>
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**Attributes:**
- Global
- Block
- Search
- Link

Not classified
### 1.3 Channel-specific system variables

<table>
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<th>Variable</th>
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<th>Unit</th>
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<th>NCK Version</th>
<th>Read Rights</th>
<th>Write Rights</th>
<th>Attributes</th>
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<tbody>
<tr>
<td>$A_{PBB_OUT}[32]$</td>
<td>Array variable $A_{PBB_OUT}[n]$ is used to write a data byte (8 bits) to the PLC I/O.</td>
<td>NCK version: 16.00.00</td>
<td>***</td>
<td>***</td>
<td>***</td>
<td>INT_MIN</td>
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<tr>
<td>$A_{PBW_OUT}[32]$</td>
<td>Array variable $A_{PBW_OUT}[n]$ is used to write a data word (16 bits) to the PLC I/O.</td>
<td>NCK version: 16.00.00</td>
<td>***</td>
<td>***</td>
<td>***</td>
<td>INT_MIN</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>$A_{PBD_OUT}[32]$</td>
<td>Array variable $A_{PBD_OUT}[n]$ is used to write a data doubleword (32 bits) to the PLC I/O.</td>
<td>NCK version: 16.00.00</td>
<td>***</td>
<td>***</td>
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<td>INT_MIN</td>
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</table>
## 1.3 Channel-specific system variables

### DOUBLE $A_PBR_OUT[32]$

**description:**
Array variable $A_PBR_OUT[n]$ is used to write Real data (32 bits) to the PLC I/O.

**description of field limits:**
The dimension is defined in $MN_PLCIO_NUM_BYTES_OUT$.

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>run-in</th>
<th>main run</th>
<th>run-in slip</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
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<tbody>
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<td>X</td>
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<td>X</td>
<td>X</td>
<td>X</td>
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<td></td>
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<tr>
<td>write:</td>
<td>X</td>
<td></td>
<td>X</td>
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<td>X</td>
<td>X</td>
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<td>X</td>
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<td>attributes:</td>
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<td>link</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### BOOL $C_IN[16]$

**description:**
$C_IN[n]$ Signal from the PLC to cycle
Reserved for SIEMENS applications!
16 input signals (i.e. 2 bytes) are available. Data transfer is cyclic.

**description of field limits:**
n: Number of input 1 - ...

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>run-in</th>
<th>main run</th>
<th>run-in slip</th>
<th>Mrun syn</th>
<th>PP</th>
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<td>X</td>
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<td>write:</td>
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<td>search</td>
<td>link</td>
<td></td>
<td></td>
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</table>

### BOOL $C_OUT[16]$

**description:**
$C_OUT[n]$ Signal from cycle to the PLC
Reserved for SIEMENS applications!
16 output signals (i.e. 2 bytes) are available. Data transfer is cyclic.

**description of field limits:**
n: Number of output 1 - ...

<table>
<thead>
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<th>main run</th>
<th>run-in slip</th>
<th>Mrun syn</th>
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<td>X</td>
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</table>
### $\$AC\_TC\_CMDT$

**description:**

$\$AC\_TC\_CMDT$

Trigger variable: $\$AC\_TC\_CMDT$ (CoMmandTrigger) assumes the value '1' for an interpolation cycle whenever a new command from the magazine management is output to the PLC.

**axis identifier:**

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<th>main run</th>
<th>runin stp</th>
<th>Mrun syn</th>
<th>PP</th>
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<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
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**unit:**

- min.: INT_MIN
- max.: INT_MAX

**read:**

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<th>runin stp</th>
<th>Mrun syn</th>
<th>PP</th>
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**write:**

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**attributes:**

- global
- block search
- link

Not classified

### $\$AC\_TC\_ACKT$

**description:**

$\$AC\_TC\_ACKT$

Trigger variable: $\$AC\_TC\_ACKT$ (ACKnowledgeTrigger) assumes the value '1' for an interpolation cycle whenever the PLC acknowledges a TM command.

**axis identifier:**

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<th>runin stp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
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<th>access rights</th>
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**unit:**

- min.: INT_MIN
- max.: INT_MAX

**read:**

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<th>Mrun syn</th>
<th>PP</th>
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**write:**

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<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
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**attributes:**

- global
- block search
- link

Not classified

### $\$AC\_TC\_CMDC$

**description:**

$\$AC\_TC\_CMDC$

Counter variable: $\$AC\_TC\_CMDC$ (CoMmandCounter) is incremented by 1 every time the TM sends a command to the PLC.

**axis identifier:**

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<th>runin stp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
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**unit:**

- min.: INT_MIN
- max.: INT_MAX

**read:**

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<th>Mrun syn</th>
<th>PP</th>
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<th>OPT</th>
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<th>access rights</th>
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**write:**

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<th>runin stp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
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**attributes:**

- global
- block search
- link

Not classified
### $AC_TC_ACKC

**Counter variable:** $AC_TC_CMDC (ACKnowledgeCounter) is incremented by 1 every time the PLC acknowledges a command from the TM.

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<td><strong>Unit:</strong></td>
<td>INT_MIN</td>
</tr>
<tr>
<td><strong>Run-in:</strong></td>
<td>INT_MIN</td>
</tr>
<tr>
<td><strong>Main Run:</strong></td>
<td>INT_MIN</td>
</tr>
<tr>
<td><strong>Run-in Stp:</strong></td>
<td>INT_MIN</td>
</tr>
<tr>
<td><strong>Mrun Syn:</strong></td>
<td>INT_MIN</td>
</tr>
<tr>
<td><strong>PP:</strong></td>
<td>INT_MAX</td>
</tr>
<tr>
<td><strong>SA:</strong></td>
<td>INT_MAX</td>
</tr>
<tr>
<td><strong>OPT:</strong></td>
<td>INT_MAX</td>
</tr>
<tr>
<td><strong>Access Rights:</strong></td>
<td>INT_MAX</td>
</tr>
<tr>
<td><strong>Read:</strong></td>
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<tr>
<td><strong>Write:</strong></td>
<td>X X X X</td>
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<table>
<thead>
<tr>
<th>Attributes:</th>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Access Rights:</strong></td>
<td>Not Classified Not Classified</td>
</tr>
</tbody>
</table>

### $AC_TC_FCT

**Command number.** This specifies the requested operation.

-1: No TM command is active at the instant the variable is read.

<table>
<thead>
<tr>
<th>Description</th>
<th>$AC_TC_FCT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Axis Identifier:</strong></td>
<td>INT_MIN</td>
</tr>
<tr>
<td><strong>Unit:</strong></td>
<td>INT_MIN</td>
</tr>
<tr>
<td><strong>Run-in:</strong></td>
<td>INT_MIN</td>
</tr>
<tr>
<td><strong>Main Run:</strong></td>
<td>INT_MIN</td>
</tr>
<tr>
<td><strong>Run-in Stp:</strong></td>
<td>INT_MIN</td>
</tr>
<tr>
<td><strong>Mrun Syn:</strong></td>
<td>INT_MIN</td>
</tr>
<tr>
<td><strong>PP:</strong></td>
<td>INT_MAX</td>
</tr>
<tr>
<td><strong>SA:</strong></td>
<td>INT_MAX</td>
</tr>
<tr>
<td><strong>OPT:</strong></td>
<td>INT_MAX</td>
</tr>
<tr>
<td><strong>OEM:</strong></td>
<td>INT_MAX</td>
</tr>
<tr>
<td><strong>Access Rights:</strong></td>
<td>INT_MAX</td>
</tr>
<tr>
<td><strong>Read:</strong></td>
<td>X X X X</td>
</tr>
<tr>
<td><strong>Write:</strong></td>
<td>X X X X</td>
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<table>
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<th>Global Block Search Link</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Access Rights:</strong></td>
<td>Not Classified Not Classified</td>
</tr>
</tbody>
</table>

### $AC_TC_STATUS

**Current status of the command - to be read via $AC_TC_FCT.**

-1: No TM command is active at the instant the variable is read.

<table>
<thead>
<tr>
<th>Description</th>
<th>$AC_TC_STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Axis Identifier:</strong></td>
<td>INT_MIN</td>
</tr>
<tr>
<td><strong>Unit:</strong></td>
<td>INT_MIN</td>
</tr>
<tr>
<td><strong>Run-in:</strong></td>
<td>INT_MIN</td>
</tr>
<tr>
<td><strong>Main Run:</strong></td>
<td>INT_MIN</td>
</tr>
<tr>
<td><strong>Run-in Stp:</strong></td>
<td>INT_MIN</td>
</tr>
<tr>
<td><strong>Mrun Syn:</strong></td>
<td>INT_MIN</td>
</tr>
<tr>
<td><strong>PP:</strong></td>
<td>INT_MAX</td>
</tr>
<tr>
<td><strong>SA:</strong></td>
<td>INT_MAX</td>
</tr>
<tr>
<td><strong>OPT:</strong></td>
<td>INT_MAX</td>
</tr>
<tr>
<td><strong>OEM:</strong></td>
<td>INT_MAX</td>
</tr>
<tr>
<td><strong>Access Rights:</strong></td>
<td>INT_MAX</td>
</tr>
<tr>
<td><strong>Read:</strong></td>
<td>X X X X</td>
</tr>
<tr>
<td><strong>Write:</strong></td>
<td>X X X X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Attributes:</th>
<th>Global Block Search Link</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Access Rights:</strong></td>
<td>Not Classified Not Classified</td>
</tr>
</tbody>
</table>
### $\text{AC_TC_THNO}$

**Description:**
Number of the toolholder (specifically the spindle no.) to which the new tool is to be loaded.

-1: No TM command is active at the instant the variable is read.

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>NCK version:</th>
<th>INT_MAX</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in main run runin syn Mrun syn PP SA OPT OEM access rights</td>
<td>read: X X X X X X X</td>
<td>write: X X X X X</td>
</tr>
<tr>
<td>attributes: global block search link</td>
<td>Not classified Not classified</td>
<td></td>
</tr>
</tbody>
</table>

### $\text{AC_TC_TNO}$

**Description:**
NCK internal T number of the new (to be loaded) tool.

0: There is no new tool.

-1: No TM command is active at the instant the variable is read.

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>NCK version:</th>
<th>INT_MAX</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in main run runin syn Mrun syn PP SA OPT OEM access rights</td>
<td>read: X X X X X X X</td>
<td>write: X X X X X</td>
</tr>
<tr>
<td>attributes: global block search link</td>
<td>Not classified Not classified</td>
<td></td>
</tr>
</tbody>
</table>

### $\text{AC_TC_MMYN}$

**Description:**
Home magazine number of the new (to be loaded) tool.

0: There is no new tool, or the new tool (if $\text{AC_TC_TNO} > 0$) is not loaded (manual tool).

-1: No TM command is active at the instant the variable is read.

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>NCK version:</th>
<th>INT_MAX</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in main run runin syn Mrun syn PP SA OPT OEM access rights</td>
<td>read: X X X X X X X</td>
<td>write: X X X X X</td>
</tr>
<tr>
<td>attributes: global block search link</td>
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<td></td>
</tr>
</tbody>
</table>
### 1 System variable

#### 1.3 Channel-specific system variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>$AC_TC_LMYN</td>
<td>Home location number of the new (to be loaded) tool. 0: There is no new tool, or the new tool (if $AC_TC_TNO &gt; 0) is not loaded (manual tool). -1: No TM command is active at the instant the variable is read.</td>
</tr>
<tr>
<td>$AC_TC_MFN</td>
<td>Source magazine number of the new tool. 0: There is no new tool. -1: No TM command is active at the instant the variable is read.</td>
</tr>
<tr>
<td>$AC_TC_LFN</td>
<td>Source location number of the new tool. 0: There is no new tool. -1: No TM command is active at the instant the variable is read.</td>
</tr>
</tbody>
</table>
### $AC_TC_MTN

**description:**
$AC_TC_MTN
Target magazine number of the new tool.
0: There is no new tool.
-1: No TM command is active at the instant the variable is read.

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>NCK version: 16.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>INT_MAX</td>
</tr>
<tr>
<td>read:</td>
<td>X X X</td>
</tr>
<tr>
<td>write:</td>
<td></td>
</tr>
<tr>
<td>attributes:</td>
<td>global block search</td>
</tr>
<tr>
<td>access rights:</td>
<td>Not classified</td>
</tr>
</tbody>
</table>

### $AC_TC_LTN

**description:**
$AC_TC_LTN
Target location number of the new tool.
0: There is no new tool.
-1: No TM command is active at the instant the variable is read.

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>NCK version: 16.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>INT_MAX</td>
</tr>
<tr>
<td>read:</td>
<td>X X X</td>
</tr>
<tr>
<td>write:</td>
<td></td>
</tr>
<tr>
<td>attributes:</td>
<td>global block search</td>
</tr>
<tr>
<td>access rights:</td>
<td>Not classified</td>
</tr>
</tbody>
</table>

### $AC_TC_MFO

**description:**
$AC_TC_MFO
Source magazine number of the old (to be replaced) tool.
0: There is no old tool.
-1: No TM command is active at the instant the variable is read.

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>NCK version: 16.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>INT_MAX</td>
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<tr>
<td>read:</td>
<td>X X X</td>
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<tr>
<td>write:</td>
<td></td>
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<tr>
<td>attributes:</td>
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<td>access rights:</td>
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</table>
### 1.3 Channel-specific system variables

<table>
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<tr>
<th><strong>$AC_TC_LFO</strong></th>
<th><strong>$AC_TC_MTO</strong></th>
<th><strong>$AC_TC_LTO</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>description:</strong></td>
<td><strong>description:</strong></td>
<td><strong>description:</strong></td>
</tr>
<tr>
<td>$AC_TC_LFO Source location number of the old (to be replaced) tool.</td>
<td>$AC_TC_MTO Target magazine number of the old (to be replaced) tool.</td>
<td>$AC_TC_LTO Target location number of the old (to be replaced) tool.</td>
</tr>
<tr>
<td>0: There is no old tool.</td>
<td>0: There is no old tool.</td>
<td>0: There is no old tool.</td>
</tr>
<tr>
<td>-1: No TM command is active at the instant the variable is read.</td>
<td>-1: No TM command is active at the instant the variable is read.</td>
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</tr>
<tr>
<td><strong>axis identifier:</strong></td>
<td><strong>axis identifier:</strong></td>
<td><strong>axis identifier:</strong></td>
</tr>
<tr>
<td>NCK version: 16.00.00</td>
<td>NCK version: 16.00.00</td>
<td>NCK version: 16.00.00</td>
</tr>
<tr>
<td><strong>unit:</strong></td>
<td><strong>unit:</strong></td>
<td><strong>unit:</strong></td>
</tr>
<tr>
<td>run-in main run runin stp Mrun syn PP SA OPT OEM access rights</td>
<td>run-in main run runin stp Mrun syn PP SA OPT OEM access rights</td>
<td>run-in main run runin stp Mrun syn PP SA OPT OEM access rights</td>
</tr>
<tr>
<td><strong>read:</strong></td>
<td><strong>read:</strong></td>
<td><strong>read:</strong></td>
</tr>
<tr>
<td>X X X X X X X</td>
<td>X X X X X X X</td>
<td>X X X X X X X</td>
</tr>
<tr>
<td><strong>write:</strong></td>
<td><strong>write:</strong></td>
<td><strong>write:</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>attributes: global block search link</td>
<td>attributes: global block search link</td>
<td>attributes: global block search link</td>
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<tr>
<td>Not classified Not classified</td>
<td>Not classified Not classified</td>
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</tbody>
</table>
### 1.3 Channel-specific System Variables

<table>
<thead>
<tr>
<th>INT</th>
<th>Description</th>
<th>NCK Version</th>
<th>Run-in</th>
<th>Main Run</th>
<th>Run-in Stp</th>
<th>Mrun Sync</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>$A_YEAR$</td>
<td>System time year</td>
<td>00.00.00</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>$A_MONTH$</td>
<td>System time month</td>
<td>06.00.00</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>$A_DAY$</td>
<td>System time day</td>
<td>06.00.00</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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</tbody>
</table>
### 1 System variable

#### 1.3 Channel-specific system variables

<table>
<thead>
<tr>
<th>INT $A_HOUR$</th>
<th>description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$A_HOUR$</td>
<td>System time hour</td>
</tr>
<tr>
<td>axis identifier:</td>
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</tr>
<tr>
<td>unit: - min.: max.:</td>
<td>INT_MAX</td>
</tr>
<tr>
<td>run-in main run runin stp Mrun syn PP SA OPT OEM access rights</td>
<td>read: X X X X X X</td>
</tr>
<tr>
<td>write:</td>
<td>attributes: global block search link</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>INT $A_MINUTE$</th>
<th>description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$A_MINUTE$</td>
<td>System time minute</td>
</tr>
<tr>
<td>axis identifier:</td>
<td>NCK version: 06.00.00</td>
</tr>
<tr>
<td>unit: - min.: max.:</td>
<td>INT_MAX</td>
</tr>
<tr>
<td>run-in main run runin stp Mrun syn PP SA OPT OEM access rights</td>
<td>read: X X X X X X</td>
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<tr>
<td>write:</td>
<td>attributes: global block search link</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>INT $A_SECOND$</th>
<th>description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$A_SECOND$</td>
<td>System time second</td>
</tr>
<tr>
<td>axis identifier:</td>
<td>NCK version: 06.00.00</td>
</tr>
<tr>
<td>unit: - min.: max.:</td>
<td>INT_MAX</td>
</tr>
<tr>
<td>run-in main run runin stp Mrun syn PP SA OPT OEM access rights</td>
<td>read: X X X X X X</td>
</tr>
<tr>
<td>write:</td>
<td>attributes: global block search link</td>
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</table>

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SINUMERIK 840D sl/840Di sl/ 840D/ 840Di, List of System Variables (PGA1), 01/2008
### INT  $A_MSECOND$

**description:**

$A_MSECOND$
System time millisecond

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>unit:</th>
<th>min.:</th>
<th>max.:</th>
</tr>
</thead>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>run-in</th>
<th>main run</th>
<th>runin stp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
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<td>X</td>
<td>X</td>
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<td></td>
</tr>
</tbody>
</table>

**write:**

attributes: global block search link

Not classified Not classified

---

### DOUBLE  $AC_TIME$

**description:**

Variable $AC_TIME$ determines the time from the block start in seconds.

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>unit:</th>
<th>min.:</th>
<th>max.:</th>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>run-in</th>
<th>main run</th>
<th>runin stp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

**write:**

attributes: global block search link

Not classified Not classified

---

### DOUBLE  $AC_TIMES$

**description:**

$AC_TIMES$
Time from block start (REAL) in seconds (excluding times for internally generated intermediate blocks).
Each programmed block can be divided into a sequence of sub-blocks for sequential processing.
$AC_TIMES$ is set to zero only during the 1st cycle of the 1st block in the sequence. It is then incremented in seconds. The variable therefore allows time measurements to be taken over the whole block sequence.
The variable can be accessed only from synchronized actions.

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>unit:</th>
<th>min.:</th>
<th>max.:</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>0</td>
<td>DBL_MAX</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>run-in</th>
<th>main run</th>
<th>runin stp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<td></td>
</tr>
</tbody>
</table>

**write:**

attributes: global block search link

Not classified Not classified
1 System variable 01/2008

1.3 Channel-specific system variables

DOUBLE $AC_TIMEC

description:
Variable $AC_TIMEC determines the number of interpolation cycles which have elapsed since the block start.

axis identifier: NCK version: 06.00.00
unit: - min.: 0 max.: DBL_MAX
run-in main run runin stp Mrun syn PP SA OPT OEM access rights
read: X X X X
write: X X X X
attributes: global block search link

DOUBLE $AC_TIMESC

description:
$AC_TIMESC
Time from block start (Real) in IPO cycles (excluding cycles for internally generated intermediate blocks). Each programmed block can be divided into a sequence of sub-blocks for sequential processing.
$AC_TIMESC is set to zero only during the 1st cycle of the 1st block in the sequence. It is then incremented in IPO cycles. The variable therefore allows time measurements to be taken over the whole block sequence.
The variable can be accessed only from synchronized actions.

axis identifier: NCK version: 54.00.00
unit: - min.: max.: DBL_MAX
run-in main run runin stp Mrun syn PP SA OPT OEM access rights
read: X X X X
write: X X X X
attributes: global block search link

Not classified Not classified
1.3 Channel-specific system variables

**DOUBLE $AC_TIMER[1]**

Description:
Array variable $AC_TIMER[n]$ is an application-related timer. The time in seconds is counted in multiples of an interpolation cycle.
The timer is started by assigning a value:
$AC_TIMER[n]=<\text{start value}>$
The timers can be stopped by assigning a negative value:
$AC_TIMER[n]=-1$
The current timer count can be read while the time variable is running or stopped. When the time variable is stopped by assigning -1, the last count value remains stored in the variable and can continue to be read.

Description of field limits:
The dimension is defined in $MC.MM.NUM.AC_TIMER$.

<table>
<thead>
<tr>
<th>Axis identifier</th>
<th>NCK version: 13.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit:</td>
<td>DBL_MIN</td>
</tr>
<tr>
<td>Run-in</td>
<td>DBL_MIN</td>
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<tr>
<td>Main run</td>
<td>DBL_MIN</td>
</tr>
<tr>
<td>Runin slip</td>
<td>DBL_MIN</td>
</tr>
<tr>
<td>Mrun syn</td>
<td>DBL_MAX</td>
</tr>
<tr>
<td>PP</td>
<td>DBL_MAX</td>
</tr>
<tr>
<td>SA</td>
<td>DBL_MAX</td>
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<tr>
<td>OPI</td>
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<tr>
<td>OEM</td>
<td>DBL_MAX</td>
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<td>Access rights</td>
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</tr>
<tr>
<td>Read:</td>
<td>X</td>
</tr>
<tr>
<td>Write:</td>
<td>X</td>
</tr>
<tr>
<td>Attributes:</td>
<td>Global</td>
</tr>
<tr>
<td></td>
<td>Block search</td>
</tr>
<tr>
<td></td>
<td>Sink</td>
</tr>
</tbody>
</table>

**DOUBLE $AC_PRTIME_M**

Description:
$AC_PRTIME_M \ "ProgramRunTIME-Main"$
Reading and setting (initialization) of the precalculated program run time (machining time)
During a block search, the anticipated processing time of the skipped blocks in the part program is calculated by the NCK, and made available in this system variable and the OPI variable 'acPRTimeM'. This value is cleared by writing a value to the variable.

<table>
<thead>
<tr>
<th>Axis identifier</th>
<th>NCK version: 13.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit:</td>
<td>DBL_MAX</td>
</tr>
<tr>
<td>Run-in</td>
<td>DBL_MAX</td>
</tr>
<tr>
<td>Main run</td>
<td>DBL_MAX</td>
</tr>
<tr>
<td>Runin slip</td>
<td>DBL_MAX</td>
</tr>
<tr>
<td>Mrun syn</td>
<td>DBL_MAX</td>
</tr>
<tr>
<td>PP</td>
<td>DBL_MAX</td>
</tr>
<tr>
<td>SA</td>
<td>DBL_MAX</td>
</tr>
<tr>
<td>OPI</td>
<td>DBL_MAX</td>
</tr>
<tr>
<td>OEM</td>
<td>DBL_MAX</td>
</tr>
<tr>
<td>Access rights</td>
<td></td>
</tr>
<tr>
<td>Read:</td>
<td>X</td>
</tr>
<tr>
<td>Write:</td>
<td>X</td>
</tr>
<tr>
<td>Attributes:</td>
<td>Global</td>
</tr>
<tr>
<td></td>
<td>Block search</td>
</tr>
<tr>
<td></td>
<td>Sink</td>
</tr>
</tbody>
</table>

Not classified Not classified
### $AC_PRTIME_A$

**Description:**

$AC_PRTIME_A$ "Program Run TIME-Auxilary"

Reading and setting (initialization) of the precalculated program run time (idle time)

During a block search, the anticipated processing time (idle time) of the skipped blocks in the part program is calculated by the NCK, and made available in this system variable and the OPI variable ‘acPRTimeA’.

This value is cleared by writing a value to the variable.

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>NCK Version</th>
<th>Unit</th>
<th>Min.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin slip</td>
<td>Mrun syn</td>
<td>PP</td>
</tr>
<tr>
<td>read: X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>write: X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### $AC_PRTIME_M_INC$

**Description:**

$AC_PRTIME_M_INC$ "Program Run TIME-Main-INCrement"

Incrementation of the calculated program run time (main time)

During a block search, the anticipated processing time of the skipped blocks in the part program can be calculated by the NCK and stored in OPI variable ‘acPRTimeM’. Since certain times (e.g. PLC times) are not considered, the calculated program runtime can be corrected by setting this variable explicitly.

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>NCK Version</th>
<th>Unit</th>
<th>Min.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin slip</td>
<td>Mrun syn</td>
<td>PP</td>
</tr>
<tr>
<td>read: X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>write: X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### $AC_PRTIME_A_INC$

**Description:**

$AC_PRTIME_A_INC$ "Program Run TIME-Auxilary-INCrement"

Incrementation of accumulated program run time (auxiliary time)

During a block search, the anticipated processing time of the skipped blocks in the part program can be calculated by the NCK and stored in OPI variable ‘acPRTimeM’. Since certain times (e.g. PLC times) are not considered, the calculated program runtime can be corrected by setting this variable explicitly.

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>NCK Version</th>
<th>Unit</th>
<th>Min.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin slip</td>
<td>Mrun syn</td>
<td>PP</td>
</tr>
<tr>
<td>read: X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>write: X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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SINUMERIK 840D sl/840Di sl/ 840D/ 840Di, List of System Variables (PGA1), 01/2008
### 1.3 Channel-specific system variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>$AC_PATHN</td>
<td>Variable $AC_PATHN is a normalized path parameter whose value varies between 0 at the block start and 1 at the block end.</td>
</tr>
<tr>
<td></td>
<td><strong>axis identifier:</strong> NCK version: 06.00.00</td>
</tr>
<tr>
<td></td>
<td><strong>unit:</strong>                     min.: 0 max.: 1</td>
</tr>
<tr>
<td></td>
<td><strong>run-in</strong>:                   main run runin stp Mrun syn PP SA OPI OEM access</td>
</tr>
<tr>
<td></td>
<td><strong>read:</strong>                     X X X X X</td>
</tr>
<tr>
<td></td>
<td><strong>write:</strong>                    X X X X</td>
</tr>
<tr>
<td></td>
<td><strong>attributes</strong>: global block search link</td>
</tr>
<tr>
<td></td>
<td><strong>Not classified</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>$AC_DTBW</th>
<th>Variable $AC_DTBW determines the geometric distance from the block start in the workpiece coordinate system. The programmed position is used to calculate the distance. If the axis is a coupled axis, the position component derived from the axis coupling is not considered.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>axis identifier:</strong> NCK version: 06.00.00</td>
</tr>
<tr>
<td></td>
<td><strong>unit:</strong>                     min.: DBL_MIN max.: DBL_MAX</td>
</tr>
<tr>
<td></td>
<td><strong>run-in</strong>:                   main run runin stp Mrun syn PP SA OPI OEM access</td>
</tr>
<tr>
<td></td>
<td><strong>read:</strong>                     X X X X X</td>
</tr>
<tr>
<td></td>
<td><strong>write:</strong>                    X X X X</td>
</tr>
<tr>
<td></td>
<td><strong>attributes</strong>: global block search link</td>
</tr>
<tr>
<td></td>
<td><strong>Not classified</strong></td>
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</table>

<table>
<thead>
<tr>
<th>$AC_REPOS_PATH_MODE</th>
<th>Type of Repos mode</th>
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</thead>
<tbody>
<tr>
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<td>$AC_REPOS_PATH_MODE</td>
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<tr>
<td></td>
<td></td>
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<td></td>
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<td>$AC_REPOS_PATH_MODE</td>
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</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>DOUBLE</td>
<td>$AC_DTBB</td>
</tr>
<tr>
<td>--------</td>
<td>-----------</td>
</tr>
<tr>
<td>description:</td>
<td>Variable $AC_DTBB$ determines the geometric distance from the block start in the basic coordinate system. The programmed position is used to calculate the distance. If the axis is a coupled axis, the position component derived from the axis coupling is not considered.</td>
</tr>
<tr>
<td>axis identifier:</td>
<td>NCK version: 06.00.00</td>
</tr>
<tr>
<td>unit:</td>
<td>run-in main run runin slp Mrun syn PP SA OPT OEM access rights</td>
</tr>
<tr>
<td>read:</td>
<td>X X</td>
</tr>
<tr>
<td>write:</td>
<td>X X X</td>
</tr>
<tr>
<td>attributes:</td>
<td>global block search link</td>
</tr>
<tr>
<td>access rights:</td>
<td>Not classified Not classified</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>DOUBLE</th>
<th>$AC_DTEW</th>
</tr>
</thead>
<tbody>
<tr>
<td>description:</td>
<td>Variable $AC_DTEW$ determines the geometric distance from the block end in the workpiece coordinate system. The programmed position is used to calculate the distance. If the axis is a coupled axis, the position component derived from the axis coupling is not considered.</td>
</tr>
<tr>
<td>axis identifier:</td>
<td>NCK version: 06.00.00</td>
</tr>
<tr>
<td>unit:</td>
<td>run-in main run runin slp Mrun syn PP SA OPT OEM access rights</td>
</tr>
<tr>
<td>read:</td>
<td>X X</td>
</tr>
<tr>
<td>write:</td>
<td>X X X</td>
</tr>
<tr>
<td>attributes:</td>
<td>global block search link</td>
</tr>
<tr>
<td>access rights:</td>
<td>Not classified Not classified</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DOUBLE</th>
<th>$AC_DTEB</th>
</tr>
</thead>
<tbody>
<tr>
<td>description:</td>
<td>Variable $AC_DTEB$ determines the geometric distance from the block end in the basic coordinate system. The programmed position is used to calculate the distance. If the axis is a coupled axis, the position component derived from the axis coupling is not considered.</td>
</tr>
<tr>
<td>axis identifier:</td>
<td>NCK version: 06.00.00</td>
</tr>
<tr>
<td>unit:</td>
<td>run-in main run runin slp Mrun syn PP SA OPT OEM access rights</td>
</tr>
<tr>
<td>read:</td>
<td>X X</td>
</tr>
<tr>
<td>write:</td>
<td>X X X</td>
</tr>
<tr>
<td>attributes:</td>
<td>global block search link</td>
</tr>
<tr>
<td>access rights:</td>
<td>Not classified Not classified</td>
</tr>
</tbody>
</table>
### DOUBLE $AC\_PLTBB

**description:** Variable $AC\_PLTBB determines the path from the block start in the basic coordinate system.

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>mm</th>
<th>min.:</th>
<th>DBL_MIN</th>
<th>max.:</th>
<th>DBL_MAX</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td></td>
<td>main run</td>
<td></td>
<td>runin stp</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mrun syn</td>
<td>PP</td>
<td>SA</td>
<td>OEM</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

**attributes:** global block search link

**Not classified**

### DOUBLE $AC\_PLTEB

**description:** Variable $AC\_PLTEB determines the path to the block end in the basic coordinate system.

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>mm</th>
<th>min.:</th>
<th>DBL_MIN</th>
<th>max.:</th>
<th>DBL_MAX</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td></td>
<td>main run</td>
<td></td>
<td>runin stp</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mrun syn</td>
<td>PP</td>
<td>SA</td>
<td>OEM</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

**attributes:** global block search link

**Not classified**

### DOUBLE $AC\_DELT

**description:** Variable $AC\_DELT is used to read the stored path distance to go in the workpiece coordinate system after delete distance to go in motion-synchronous actions.

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>mm</th>
<th>min.:</th>
<th>DBL_MIN</th>
<th>max.:</th>
<th>DBL_MAX</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td></td>
<td>main run</td>
<td></td>
<td>runin stp</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mrun syn</td>
<td>PP</td>
<td>SA</td>
<td>OEM</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

**attributes:** global block search link

**Not classified**
### BOOL $P_{\text{APDV}}$

<table>
<thead>
<tr>
<th>description:</th>
<th>$P_{\text{APDV}}$ Returns True if the position values which can be read with $P_{\text{APR[X]}}$ or $P_{\text{AEP[X]}}$ (respectively starting point or contour point in the case of smooth approach and retraction) are valid.</th>
</tr>
</thead>
<tbody>
<tr>
<td>axis identifier:</td>
<td>NCK version: 13.00.00</td>
</tr>
<tr>
<td>unit:</td>
<td>run-in</td>
</tr>
<tr>
<td>min.:</td>
<td>FALSE</td>
</tr>
<tr>
<td>max.:</td>
<td>TRUE</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
</tr>
<tr>
<td>Not classified</td>
<td>Not classified</td>
</tr>
</tbody>
</table>

### DOUBLE $P_{\text{F}}$

<table>
<thead>
<tr>
<th>description:</th>
<th>Variable $P_{\text{F}}$ is used to read the last programmed path feed $F$.</th>
</tr>
</thead>
<tbody>
<tr>
<td>axis identifier:</td>
<td>NCK version: 06.00.00</td>
</tr>
<tr>
<td>unit:</td>
<td>mm/min</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
</tr>
<tr>
<td>Not classified</td>
<td>Not classified</td>
</tr>
</tbody>
</table>

### DOUBLE $AC_{\text{F}}$

<table>
<thead>
<tr>
<th>description:</th>
<th>Variable $AC_{\text{F}}$ is used to read the active programmed path feed $F$.</th>
</tr>
</thead>
<tbody>
<tr>
<td>axis identifier:</td>
<td>NCK version: 20.10.00</td>
</tr>
<tr>
<td>unit:</td>
<td>mm/min</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td></td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
</tr>
<tr>
<td>Not classified</td>
<td>Not classified</td>
</tr>
</tbody>
</table>
### 1.3 Channel-specific system variables

#### $\text{DOUBLE } \$AC\_F\_G0$

**Description:**
Variable $\$AC\_F\_G0$ returns the maximum rapid traverse velocity in the block.

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>NCK version: 53.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit: mm/min</td>
<td>min.: DBL_MIN max.: DBL_MAX</td>
</tr>
<tr>
<td>read: X</td>
<td>write: X X X X</td>
</tr>
<tr>
<td>attributes: global</td>
<td>Not classified</td>
</tr>
</tbody>
</table>

#### $\text{DOUBLE } \$AC\_OVR$

**Description:**
The variable $\$AC\_OVR$ determines the path override specifiable via synchronized action. The path override must be set by assigning a value cyclically to $\$AC\_OVR$ in each interpolation cycle. Otherwise $\$AC\_OVR$ is reset to 100%.

The total path override can be read via $\$AC\_TOTAL\_OVR$.

The total path override without the programmable override (e.g. OVR = 10) is limited to the maximum value defined by the machine data $\$MN\_OVR\_FACTOR\_LIMIT\_BIN$ or $\$MN\_OVR\_FACTOR\_FEEDRATE[31]$. Values less than 0 are not allowed.

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>NCK version: 06.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit: -</td>
<td>min.: DBL_MIN max.: DBL_MAX</td>
</tr>
<tr>
<td>read: X</td>
<td>write: X X X X</td>
</tr>
<tr>
<td>attributes: global</td>
<td>Not classified</td>
</tr>
</tbody>
</table>

#### $\text{DOUBLE } \$AC\_PLC\_OVR$

**Description:**
The variable $\$AC\_PLC\_OVR$ determines the path override defined by the PLC. This is the feedrate override that is set via the Machine Control Panel.

The rapid traverse override (settable on the Machine Control Panel) is effective with G0 blocks. If the rapid traverse reduction has been activated via the operator interface, then, with G0 blocks, $\$SC\_OVR\_RAPID\_FACTOR$ is also taken into account multiplicatively.

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>NCK version: 54.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit: -</td>
<td>min.: DBL_MAX max.:</td>
</tr>
<tr>
<td>read: X</td>
<td>write: X X X X</td>
</tr>
<tr>
<td>attributes: global</td>
<td>Not classified</td>
</tr>
</tbody>
</table>
### $AC\_TOTAL\_OVR

**Description:**
The variable $AC\_TOTAL\_OVR supplies the total path override. The value is calculated from the override from the PLC, the synchronized action override ($AC\_OVR$) and the programmable override (e.g. OVR = 10).

\[
AC\_TOTAL\_OVR = AC\_PLC\_OVR \times AC\_OVR \times OVR /10000.
\]

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>NCK Version:</th>
<th>Unit:</th>
<th>Run-In</th>
<th>Main Run</th>
<th>Runin Slp</th>
<th>Mrun Syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
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<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

**Attributes:**
- Global
- Block search
- Link

---

### $AC\_VC

**Description:**
$AC\_VC$

Additive path feed override for synchronized actions.
The override value must be rewritten in every Ipo cycle or else a value of 0 is applied.
The override value is ignored with an override of 0. Otherwise, the override value is applied independent of the override.
The total feedrate cannot be made negative by an override value.
An upper limit is applied to ensure that the maximum axis velocities and acceleration rates cannot be exceeded. The maximum feedrate is limited by $MN\_OVR\_FACTOR\_LIMIT\_BIN, $MN\_OVR\_FACTOR\_FEEDRATE[30]$ (see machine data).
The override value is not included in the calculation in the case of G0, G33, G331, G332 and G63.
The variable can be accessed only from synchronized actions.

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>NCK Version:</th>
<th>Unit:</th>
<th>Run-In</th>
<th>Main Run</th>
<th>Runin Slp</th>
<th>Mrun Syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linear / Angular Speed</td>
<td>06.00.00</td>
<td>DBL_MIN</td>
<td>DBL_MAX</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
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</tr>
</tbody>
</table>

**Attributes:**
- Global
- Block search
- Link

---

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### $AC\_PATHACC$

**Description:**
$AC\_PATHACC$

 Defines an increased path acceleration for override changes and stop/start events.

$AC\_PATHACC$ is taken into account only if the value is higher than the prepared acceleration limit.

A value of 0 deselects the function.

Values which cause machine axis acceleration rates twice the rate configured in $MA\_MAX\_AX\_ACCEL[...]$ are limited internally.

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>NCK version:</th>
<th>45.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit:</td>
<td>m/s²</td>
<td>min.:</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin slip</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block</td>
</tr>
<tr>
<td></td>
<td>Not classified</td>
<td>Not classified</td>
</tr>
</tbody>
</table>

### $AC\_PATHJERK$

**Description:**
$AC\_PATHJERK$

 Defines an increased path jerk for override changes and stop/start events.

$AC\_PATHJERK$ is taken into account only if the value is higher than the prepared jerk limit.

A value of 0 deselects the function.

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>NCK version:</th>
<th>45.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit:</td>
<td>m/s³</td>
<td>min.:</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin slip</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block</td>
</tr>
<tr>
<td></td>
<td>Not classified</td>
<td>Not classified</td>
</tr>
</tbody>
</table>

### $AC\_VACTB$

**Description:**
$AC\_VACTB$

 Path velocity in the basic coordinate system.

The velocity is calculated from the velocities of the geometry axes - independent of FGROUP.

The variable can be accessed only from synchronized actions.

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>NCK version:</th>
<th>06.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit:</td>
<td>Linear / angular speed</td>
<td>min.:</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin slip</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block</td>
</tr>
<tr>
<td></td>
<td>Not classified</td>
<td>Not classified</td>
</tr>
</tbody>
</table>
## 1.3 Channel-specific system variables

### DOUBLE $\text{AC_VACTW}$

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\text{AC_VACTW}$ Path velocity in the workpiece coordinate system</td>
</tr>
<tr>
<td>The velocity is calculated from the velocities of the geometry axes - independent of FGROUP.</td>
</tr>
<tr>
<td>The variable can be accessed only from synchronized actions</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Axis identifier:</th>
<th>NCK version:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linear / angular speed</td>
<td>06.00.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit</th>
<th>min.:</th>
<th>max.:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linear / angular speed</td>
<td>DBL_MIN</td>
<td>DBL_MAX</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Run-in</th>
<th>Main run</th>
<th>Runin slip</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Attributes: | |
|-------------| |
| global | block search | link | |
| Not classified | Not classified | |

### DOUBLE $\text{P_S}[n]$

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\text{P_S}[n]$ n: Number of spindle</td>
</tr>
<tr>
<td>Last programmed spindle speed</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description of field limits:</th>
</tr>
</thead>
<tbody>
<tr>
<td>n: Spindle number</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Axis identifier:</th>
<th>NCK version:</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPINDLE</td>
<td>06.00.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit</th>
<th>min.:</th>
<th>max.:</th>
</tr>
</thead>
<tbody>
<tr>
<td>rpm</td>
<td></td>
<td>DBL_MAX</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Run-in</th>
<th>Main run</th>
<th>Runin slip</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>read:</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Attributes: | |
|-------------| |
| global | block search | link | |
| Not classified | Not classified | |

### DOUBLE $\text{AA_S}[n]$

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\text{AA_S}[n]$ n: Number of spindle</td>
</tr>
<tr>
<td>Actual spindle speed. The sign corresponds to the direction of rotation.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description of field limits:</th>
</tr>
</thead>
<tbody>
<tr>
<td>n: Spindle number</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Axis identifier:</th>
<th>NCK version:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>06.00.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit</th>
<th>min.:</th>
<th>max.:</th>
</tr>
</thead>
<tbody>
<tr>
<td>rpm</td>
<td></td>
<td>DBL_MAX</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Run-in</th>
<th>Main run</th>
<th>Runin slip</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Attributes: | |
|-------------| |
| global | block search | link | |
| Not classified | Not classified | |

© Siemens AG 2008 All Rights Reserved
### $P\_\text{CONSTCUT}\_S[n]$  
**NCK version:** 42.00.00

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>run-in</th>
<th>main</th>
<th>runin slp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>m/min</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| n: Number of spindle  
Last programmed constant cutting rate

### $AC\_\text{CONSTCUT}\_S[n]$  
**NCK version:** 42.00.00

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>run-in</th>
<th>main</th>
<th>runin slp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>m/min</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| n: Number of spindle  
Current constant cutting rate.

### $P\_\text{SEARCH}\_S[n]$  
**NCK version:** 20.01.00

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>run-in</th>
<th>main</th>
<th>runin slp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>rpm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| n: Number of spindle  
Last programmed spindle speed collected during block search or cutting rate

---

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SINUMERIK 840D sl/840Di sl/ 840D/ 840Di, List of System Variables (PGA1), 01/2008
### $P\_\text{SDIR}[n]$

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Last programmed direction of spindle rotation</td>
</tr>
<tr>
<td>n: Number of spindle</td>
</tr>
<tr>
<td>3: CW spindle rotation, 4: CCW spindle rotation, 5: Spindle stop</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description of field limits:</th>
</tr>
</thead>
<tbody>
<tr>
<td>n: Spindle number</td>
</tr>
<tr>
<td>axis identifier: SPINDLE</td>
</tr>
<tr>
<td>unit: NCK version: 06.00.00</td>
</tr>
<tr>
<td>run-in</td>
</tr>
<tr>
<td>main run</td>
</tr>
<tr>
<td>read:</td>
</tr>
<tr>
<td>write:</td>
</tr>
<tr>
<td>attributes: global</td>
</tr>
<tr>
<td>Not classified</td>
</tr>
</tbody>
</table>

### $AC\_\text{SDIR}[n]$

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current direction of spindle rotation</td>
</tr>
<tr>
<td>n: Number of spindle</td>
</tr>
<tr>
<td>3: CW spindle rotation, 4: CCW spindle rotation, 5: Spindle stop</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description of field limits:</th>
</tr>
</thead>
<tbody>
<tr>
<td>n: Spindle number</td>
</tr>
<tr>
<td>axis identifier: SPINDLE</td>
</tr>
<tr>
<td>unit: NCK version: 06.00.00</td>
</tr>
<tr>
<td>run-in</td>
</tr>
<tr>
<td>main run</td>
</tr>
<tr>
<td>read:</td>
</tr>
<tr>
<td>write:</td>
</tr>
<tr>
<td>attributes: global</td>
</tr>
<tr>
<td>Not classified</td>
</tr>
</tbody>
</table>
### 1.3 Channel-specific system variables

#### INT $P\_SEARCH\_SDIR[n]$

<table>
<thead>
<tr>
<th>$P_SEARCH_SDIR[n]$</th>
<th>description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$n$: Number of spindle</td>
<td>Last programmed direction of spindle rotation collected during block search</td>
</tr>
<tr>
<td>3: M3 CW spindle rotation</td>
<td></td>
</tr>
<tr>
<td>4: M4 CCW spindle rotation</td>
<td></td>
</tr>
<tr>
<td>5: M5 Spindle stop</td>
<td></td>
</tr>
<tr>
<td>-19: M19, SPOS, SPOSA spindle positioning, position and approach mode</td>
<td></td>
</tr>
<tr>
<td>is read from SEARCH variables</td>
<td></td>
</tr>
<tr>
<td>70: M70 Changeover to axis mode</td>
<td></td>
</tr>
<tr>
<td>-5: No direction of rotation programmed, not output.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>SPINDLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCK version:</td>
<td>20.01.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>unit:</th>
<th>run-in</th>
<th>main run</th>
<th>runin slp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>min.</td>
<td>-</td>
<td>3</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>
<td>70</td>
</tr>
</tbody>
</table>

| read: | X |
| write: | X |

<table>
<thead>
<tr>
<th>attributes:</th>
<th>global</th>
<th>block search</th>
<th>link</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in main run runin slp Mrun syn PP SA OPT OEM access rights</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not classified</td>
<td>Not classified</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### INT $P\_SMODE[n]$

<table>
<thead>
<tr>
<th>$P_SMODE[n]$</th>
<th>description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$n$: Number of spindle</td>
<td>The spindle mode resulting from the last spindle programming action is returned.</td>
</tr>
<tr>
<td>0: No spindle programmed in channel, or spindle is active in another channel, or</td>
<td></td>
</tr>
<tr>
<td>is being used by the PLC (FC18) or synchronized actions.</td>
<td></td>
</tr>
<tr>
<td>1: Speed control mode</td>
<td></td>
</tr>
<tr>
<td>2: Positioning mode</td>
<td></td>
</tr>
<tr>
<td>3: Synchronous mode</td>
<td></td>
</tr>
<tr>
<td>4: Axis mode</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>SPINDLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCK version:</td>
<td>06.00.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>unit:</th>
<th>run-in</th>
<th>main run</th>
<th>runin slp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>min.</td>
<td>-</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>
<td>4</td>
</tr>
</tbody>
</table>

| read: | X |
| write: | X |

<table>
<thead>
<tr>
<th>attributes:</th>
<th>global</th>
<th>block search</th>
<th>link</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in main run runin slp Mrun syn PP SA OPT OEM access rights</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not classified</td>
<td>Not classified</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### $AC_SMODE[n]$

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$AC_SMODE[n]$</td>
</tr>
<tr>
<td>n: Number of spindle</td>
</tr>
<tr>
<td>Current spindle mode:</td>
</tr>
<tr>
<td>0: No spindle programmed in channel</td>
</tr>
<tr>
<td>1: Speed control mode</td>
</tr>
<tr>
<td>2: Positioning mode</td>
</tr>
<tr>
<td>3: Synchronous mode</td>
</tr>
<tr>
<td>4: Axis mode</td>
</tr>
<tr>
<td>Description of field limits:</td>
</tr>
<tr>
<td>n: Spindle number</td>
</tr>
</tbody>
</table>

### $P_SGEAR[n]$

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$P_SGEAR[n]$</td>
</tr>
<tr>
<td>n: Number of spindle</td>
</tr>
<tr>
<td>Spindle gear stage last programmed or requested by S programming in the case of M40</td>
</tr>
<tr>
<td>1: 1. Gear stage requested</td>
</tr>
<tr>
<td>5: 5. Gear stage requested</td>
</tr>
<tr>
<td>Description of field limits:</td>
</tr>
<tr>
<td>n: Spindle number</td>
</tr>
</tbody>
</table>

---

#### $AC_SMODE[n]$ Table

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>n:</td>
<td>Spindle number</td>
</tr>
</tbody>
</table>

#### $P_SGEAR[n]$ Table

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>n:</td>
<td>Spindle number</td>
</tr>
</tbody>
</table>

---

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SINUMERIK 840D sl/840Di sl/ 840D/ 840Di, List of System Variables (PGA1), 01/2008
### $AC_SGEAR[n]$

**Description:**

$AC_SGEAR[n]$

*n:* Number of spindle

Active spindle gear stage

1: 1. Gear stage is active

....

5: 5. Gear stage is active

**Description of field limits:**

*n:* Spindle number

**Axis Identifier:**

- **NCK version:** 41.00.00
- **Unit:** -
- **Min.:** 1
- **Max.:** 5

**Read:** X X X X X X

**Write:** X X X X X

**Attributes:**

- Global
- Block search
- Link

- Not classified
- Not classified

### $P_SAUTOGEAR[n]$

**Description:**

$P_SAUTOGEAR[n]$

*n:* Number of spindle

Automatic gear stage change (M40) is programmed.

0: Gear stages are requested by M41..M45

1: Gear stage is calculated and requested according to programmed speed (S) (M40 automatic gear stage change is active)

**Description of field limits:**

*n:* Spindle number

**Axis Identifier:**

- **NCK version:** 41.00.00
- **Unit:** -
- **Min.:** 1
- **Max.:** 1

**Read:** X

**Write:** X

**Attributes:**

- Global
- Block search
- Link

- Not classified
- Not classified
### $P\_SEARCH\_SGEAR[n]$  
**Description:**  
 laat programmed gear stage M function collected during block search  
- 40: M40 automatic gear stage change  
- 41: M41 1st gear stage requested  
- ...  
- 45: M45 5th gear stage requested  
**Field limits:**  
- `n`: Spindle number  
- `axis identifier`: NCK version: 20.01.00  
- `unit`: deg.  
- `run-in`: -100000000...100000000 degrees. The sign specifies the direction of travel.  
- `read`: X  
- `write`: X  
- `attributes`: global block search link  
- `access rights`: Not classified Not classified

### $P\_SEARCH\_SPOS[n]$  
**Description:**  
Spindle position or traversing path last programmed via M19, SPOS or SPOSA and collected during block search  
- Position: 0...359,999 if the value in MD 30330 MODULO\_RANGE is 360.0 degrees  
- Path: -100000000...100000000 degrees. The sign specifies the direction of travel.  
**Field limits:**  
- `n`: Spindle number  
- `axis identifier`: NCK version: 20.01.00  
- `unit`: deg.  
- `run-in`: -100000000...100000000 degrees. The sign specifies the direction of travel.  
- `read`: X  
- `write`: X  
- `attributes`: global block search link  
- `access rights`: Not classified Not classified
### 1.3 Channel-specific system variables

#### $P\_SEARCH\_SPOSMODE[n]$

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
</table>
| $P\_SEARCH\_SPOSMODE[n]$  
| n: Number of spindle  
| Position approach mode last programmed via M19, SPOS or SPOSA and collected during block search.  
| 0: DC  
| 1: AC  
| 2: IC  
| 3: DC  
| 4: ACP  
| 5: ACN  
| Description of field limits:  
| n: Spindle number  
| axis identifier: |
| NCK version: 20.01.00  
| unit: INT  
| min.: max.: 0  
| run-in main run runin slip Mrun syn PP SA OPT OEM access  
| read: X  
| write: X  
| attributes: global block search link  
| read: XX  
| write: 7  
| Not classified Not classified |

#### $P\_NUM\_SPINDLES$

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
</table>
| $P\_NUM\_SPINDLES$  
| Calculates the maximum number of spindles in the channel  
| 0: No spindle programmed in channel.  
| 1..n: Number of spindles in channel.  
| axis identifier: |
| NCK version: 20.01.00  
| unit: INT  
| min.: max.: INT_MAX  
| run-in main run runin slip Mrun syn PP SA OPT OEM access  
| read: X  
| write: X  
| attributes: global block search link  
| Not classified Not classified |
1 System variable

1.3 Channel-specific system variables

### $P\_MSNUM

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Returns the number of the master spindle.</td>
</tr>
<tr>
<td>0: No spindle programmed in channel</td>
</tr>
<tr>
<td>1..n: Number of master spindle</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Axis identifier:</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in main run runin slp Mrun syn PP SA OPT OEM access rights</td>
</tr>
<tr>
<td>read: X</td>
</tr>
<tr>
<td>write: X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit:</th>
</tr>
</thead>
<tbody>
<tr>
<td>INT_MIN</td>
</tr>
<tr>
<td>INT_MAX</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NCK version:</th>
</tr>
</thead>
<tbody>
<tr>
<td>06.00.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Attributes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>global block search link</td>
</tr>
<tr>
<td>Not classified Not classified</td>
</tr>
</tbody>
</table>

### $AC\_MSNUM

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Returns the number of the current master spindle.</td>
</tr>
<tr>
<td>0: No spindle configured</td>
</tr>
<tr>
<td>1..n: Number of master spindle</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Axis identifier:</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in main run runin slp Mrun syn PP SA OPT OEM access rights</td>
</tr>
<tr>
<td>read: X X X X</td>
</tr>
<tr>
<td>write:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit:</th>
</tr>
</thead>
<tbody>
<tr>
<td>INT_MIN</td>
</tr>
<tr>
<td>INT_MAX</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NCK version:</th>
</tr>
</thead>
<tbody>
<tr>
<td>06.00.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Attributes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>global block search link</td>
</tr>
<tr>
<td>Not classified Not classified</td>
</tr>
</tbody>
</table>

### $P\_MTHNUM

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$P_MTHNUM - meaningful only when magazine management is active</td>
</tr>
<tr>
<td>Returns the number of the master toolholder.</td>
</tr>
<tr>
<td>0: No master toolholder configured</td>
</tr>
<tr>
<td>1..n: Number of master toolholder</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Axis identifier:</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in main run runin slp Mrun syn PP SA OPT OEM access rights</td>
</tr>
<tr>
<td>read: X</td>
</tr>
<tr>
<td>write: X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit:</th>
</tr>
</thead>
<tbody>
<tr>
<td>INT_MIN</td>
</tr>
<tr>
<td>INT_MAX</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NCK version:</th>
</tr>
</thead>
<tbody>
<tr>
<td>20.00.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Attributes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>global block search link</td>
</tr>
<tr>
<td>Not classified Not classified</td>
</tr>
<tr>
<td>Type</td>
</tr>
<tr>
<td>------</td>
</tr>
</tbody>
</table>
| INT  | $AC_MTHNUM - meaningful only when magazine management is active
Returns the number of the current master toolholder:
0: No master toolholder configured
1..n: Number of master toolholder |
| BOOL | $P_GWPS[n] - Constant grinding wheel surface speed ON if TRUE
description of field limits:
n: Spindle number |
| DOUBLE | $AC_FCT1LL - Variable $AC_FCT1LL is used to define the lower limit for the first polynomial function.
The polynomial function can also be defined by FCTDEF(polynomial no., lower limit, upper limit, a0, a1, a2, a3) |

**$AC_MTHNUM**

- **Type**: INT
- **Description**: $AC_MTHNUM - meaningful only when magazine management is active
Returns the number of the current master toolholder:
0: No master toolholder configured
1..n: Number of master toolholder

**$P_GWPS[31]**

- **Type**: BOOL
- **Description**: $P_GWPS[n] - Constant grinding wheel surface speed ON if TRUE
description of field limits:
n: Spindle number

**$AC_FCT1LL**

- **Type**: DOUBLE
- **Description**: Variable $AC_FCT1LL is used to define the lower limit for the first polynomial function.
The polynomial function can also be defined by FCTDEF(polynomial no., lower limit, upper limit, a0, a1, a2, a3)
### Variable $AC_FCT2LL

**Description:**
Variable $AC_FCT2LL is used to define the lower limit for the second polynomial function. The polynomial function can also be defined by FCTDEF(polynomial no., lower limit, upper limit, a0, a1, a2, a3).

<table>
<thead>
<tr>
<th>Axis</th>
<th>Identifier</th>
<th>NCK Version</th>
<th>Read</th>
<th>Write</th>
<th>Attributes</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>06.00.00</td>
<td>XXX</td>
<td>X</td>
<td>Not classified</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>XXX</td>
<td>X</td>
<td>Not classified</td>
<td></td>
</tr>
</tbody>
</table>

### Variable $AC_FCT3LL

**Description:**
Variable $AC_FCT3LL is used to define the lower limit for the third polynomial function. The polynomial function can also be defined by FCTDEF(polynomial no., lower limit, upper limit, a0, a1, a2, a3).

<table>
<thead>
<tr>
<th>Axis</th>
<th>Identifier</th>
<th>NCK Version</th>
<th>Read</th>
<th>Write</th>
<th>Attributes</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>06.00.00</td>
<td>XXX</td>
<td>X</td>
<td>Not classified</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>XXX</td>
<td>X</td>
<td>Not classified</td>
<td></td>
</tr>
</tbody>
</table>

### Variable $AC_FCT1UL

**Description:**
Variable $AC_FCT1UL is used to define the upper limit for the first polynomial function. The polynomial function can also be defined by FCTDEF(polynomial no., lower limit, upper limit, a0, a1, a2, a3).

<table>
<thead>
<tr>
<th>Axis</th>
<th>Identifier</th>
<th>NCK Version</th>
<th>Read</th>
<th>Write</th>
<th>Attributes</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>06.00.00</td>
<td>XXX</td>
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<td>Not classified</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>XXX</td>
<td>X</td>
<td>Not classified</td>
<td></td>
</tr>
</tbody>
</table>
1.3 Channel-specific system variables

**DOUBLE $AC_FCT2UL**

**description:**
Variable $AC_FCT2UL is used to define the upper limit for the second polynomial function. The polynomial function can also be defined by FCTDEF(polynomial no., lower limit, upper limit, a0, a1, a2, a3).

**axis identifier:**
NCK version: 06.00.00

<table>
<thead>
<tr>
<th>run-in</th>
<th>main run</th>
<th>runin stp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td>7</td>
</tr>
</tbody>
</table>

attributes: global block search link

Not classified

**DOUBLE $AC_FCT3UL**

**description:**
Variable $AC_FCT3UL is used to define the upper limit for the third polynomial function. The polynomial function can also be defined by FCTDEF(polynomial no., lower limit, upper limit, a0, a1, a2, a3).

**axis identifier:**
NCK version: 06.00.00

<table>
<thead>
<tr>
<th>run-in</th>
<th>main run</th>
<th>runin stp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td>7</td>
</tr>
</tbody>
</table>

attributes: global block search link

Not classified

**DOUBLE $AC_FCT1C[4]**

**description:**
Array variable $AC_FCT1C[n] is used to program polynomial coefficients a0 - a3 for the first polynomial function. The polynomial function can also be defined by FCTDEF(polynomial no., lower limit, upper limit, a0, a1, a2, a3).

**description of field limits:**
n: Degree of order of coefficient 0 - 3

**axis identifier:**
NCK version: 06.00.00

<table>
<thead>
<tr>
<th>run-in</th>
<th>main run</th>
<th>runin stp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td>7</td>
</tr>
</tbody>
</table>

attributes: global block search link

Not classified
### 1.3 Channel-specific system variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
<th>Type</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>$AC_FCT2C[4]$</td>
<td>Array variable $AC_FCT2C[n]$ is used to program polynomial coefficients $a_0 - a_3$ for the second polynomial function.</td>
<td>DOUBLE</td>
<td>read: XXX XX X, write: XXX XX X7</td>
</tr>
<tr>
<td>$AC_FCT3C[4]$</td>
<td>Array variable $AC_FCT3C[n]$ is used to program polynomial coefficients $a_0 - a_3$ for the third polynomial function.</td>
<td>DOUBLE</td>
<td>read: XXX XX X, write: XXX XX X7</td>
</tr>
<tr>
<td>$AC_FCTLL[n]$</td>
<td>Array variable $AC_FCTLL[n]$ is used to define the lower limit for the $n$th polynomial function.</td>
<td>DOUBLE</td>
<td>read: XXX XXXX, write: XXX XX X7</td>
</tr>
</tbody>
</table>
1.3 Channel-specific system variables

| DOUBLE | $AC_FCTUL[n]$ | description: |
| Array variable $AC_FCTUL[n]$ is used to define the upper limit for the nth polynomial function. The polynomial function can also be defined by FCTDEF(polynomial no., lower limit, upper limit, a0, a1, a2, a3).
| description of field limits: |
The dimension is defined in $MC_MM_NUM_FCTDEF_ELEMENTS$. |
| axis identifier: | NCK version: | 06.00.00 |
| unit: | run-in | min.: | max.: | DBL_MIN | DBL_MAX |
| | main run | runin slip | Mrun syn | PP | SA | OPT | OEM | access rights |
| read: | X | X | X | X | X | X | |
| write: | X | X | X | X | X | X | 7 |
| attributes: | global | block search | link |
| | Not classified | Not classified |

| DOUBLE | $AC_FCT0[n]$ | description: |
| Array variable $AC_FCT0[n]$ is used to program the a0 coefficient for the nth polynomial function. The polynomial function can also be defined by FCTDEF(polynomial no., lower limit, upper limit, a0, a1, a2, a3).
| description of field limits: |
The dimension is defined in $MC_MM_NUM_FCTDEF_ELEMENTS$. |
| axis identifier: | NCK version: | 06.00.00 |
| unit: | run-in | min.: | max.: | DBL_MIN | DBL_MAX |
| | main run | runin slip | Mrun syn | PP | SA | OPT | OEM | access rights |
| read: | X | X | X | X | X | X | |
| write: | X | X | X | X | X | X | 7 |
| attributes: | global | block search | link |
| | Not classified | Not classified |

| DOUBLE | $AC_FCT1[n]$ | description: |
| Array variable $AC_FCT1[n]$ is used to program the a1 coefficient for the nth polynomial function. The polynomial function can also be defined by FCTDEF(polynomial no., lower limit, upper limit, a0, a1, a2, a3).
| description of field limits: |
The dimension is defined in $MC_MM_NUM_FCTDEF_ELEMENTS$. |
| axis identifier: | NCK version: | 06.00.00 |
| unit: | run-in | min.: | max.: | DBL_MIN | DBL_MAX |
| | main run | runin slip | Mrun syn | PP | SA | OPT | OEM | access rights |
| read: | X | X | X | X | X | X | |
| write: | X | X | X | X | X | X | 7 |
| attributes: | global | block search | link |
| | Not classified | Not classified |
### $AC_FCT2[n]$

**Description:**
Array variable $AC_FCT2[n]$ is used to program the a2 coefficient for the nth polynomial function. The polynomial function can also be defined by FCTDEF(polynomial no., lower limit, upper limit, a0, a1, a2, a3).

**Description of field limits:**
The dimension is defined in $MC_MM_NUM_FCTDEF_ELEMENTS$.

<table>
<thead>
<tr>
<th>Axis identifier</th>
<th>Unit</th>
<th>Run-in</th>
<th>Main run</th>
<th>Runin slip</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>Access rights</th>
<th>Read</th>
<th>Write</th>
<th>Attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCK version: 06.00.00</td>
<td>DBL_MIN</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<td></td>
</tr>
<tr>
<td>DBL_MAX</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<td>X</td>
<td>X</td>
<td>X</td>
<td>Not classified</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### $AC_FCT3[n]$

**Description:**
Array variable $AC_FCT3[n]$ is used to program the a3 coefficient for the nth polynomial function. The polynomial function can also be defined by FCTDEF(polynomial no., lower limit, upper limit, a0, a1, a2, a3).

**Description of field limits:**
The dimension is defined in $MC_MM_NUM_FCTDEF_ELEMENTS$.

<table>
<thead>
<tr>
<th>Axis identifier</th>
<th>Unit</th>
<th>Run-in</th>
<th>Main run</th>
<th>Runin slip</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>Access rights</th>
<th>Read</th>
<th>Write</th>
<th>Attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCK version: 06.00.00</td>
<td>DBL_MIN</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Not classified</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DBL_MAX</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<td>X</td>
<td>X</td>
<td>Not classified</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

### $AC_ALARM_STAT$

**Description:**
Variable $AC_ALARM_STAT$ returns selected alarm responses. The following bits are possible: 0x04Channel status NOREADY 0x40Stop due to alarm 0x200Signal to PLC 0x11Axes in follow-up

<table>
<thead>
<tr>
<th>Axis identifier</th>
<th>Unit</th>
<th>Run-in</th>
<th>Main run</th>
<th>Runin slip</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>Access rights</th>
<th>Read</th>
<th>Write</th>
<th>Attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCK version: 16.00.00</td>
<td>INT_MIN</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<td>X</td>
<td>X</td>
<td>X</td>
<td>Not classified</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INT_MAX</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<td>X</td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### BOOL $\text{SAN\_ESR\_TRIGGER}$

<table>
<thead>
<tr>
<th>description: $\text{SAN_ESR_TRIGGER} = 1$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trigger &quot;Extended stop and retract&quot;</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>axis identifier:</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCK version: 16.00.00</td>
</tr>
</tbody>
</table>

<p>| unit: |</p>
<table>
<thead>
<tr>
<th>run-in</th>
<th>main run</th>
<th>runinstp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>FALSE</td>
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<thead>
<tr>
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</tr>
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<tbody>
<tr>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>write:</th>
</tr>
</thead>
<tbody>
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| attributes: |
| global block search link |
| Not classified Not classified |

### BOOL $\text{SAN\_BUS\_FAIL\_TRIGGER}$

| description: Reserved for Siemens |

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<th>main run</th>
<th>runinstp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
</tr>
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<tbody>
<tr>
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<table>
<thead>
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| attributes: |
| global block search link |
| Not classified Not classified |

### BOOL $\text{AC\_ESR\_TRIGGER}$

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<th>description: $\text{AC_ESR_TRIGGER} = 1$</th>
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<td>Trigger &quot;numerically controlled ESR&quot;</td>
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<th>Mrun syn</th>
<th>PP</th>
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<th>access rights</th>
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<table>
<thead>
<tr>
<th>write:</th>
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</thead>
<tbody>
<tr>
<td>X</td>
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</tbody>
</table>

| attributes: |
| global block search link |
| Not classified Not classified |
### $AC_OPERATING_TIME

**Description:**
$AC_OPERATING_TIME$ measures the total operating time of all NC programs in AUTOMATIC mode between NC Start and end of program / NC Reset (in seconds).
The timer is zeroed after each Power On.
The measurement can be activated using channel MD 27860 $MC_PROCESS_TIMER$:
- Bit 0 = 1$AC_OPERATING_TIME$ measurement is active.
The following selection of further measurement conditions is possible:
- Bit 4 = 0No measurement when dryrun feed active
- Bit 4 = 1Measurement even when dryrun feed active
- Bit 5 = 0No measurement during program test
- Bit 5 = 1Measurement even during program test

**Use in NC program:**
IF $AC_OPERATING_TIME$ < 12000 GOTOB STARTMARK

<table>
<thead>
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<th>Axis Identifier</th>
<th>NCK Version</th>
<th>19.00.00</th>
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</thead>
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<td>Unit</td>
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<tr>
<td>read</td>
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<td>X</td>
</tr>
<tr>
<td>write</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Attributes</td>
<td>global</td>
<td>block</td>
</tr>
</tbody>
</table>

### $AC_CYCLE_TIME

**Description:**
$AC_CYCLE_TIME$ measures the operating time of the selected NC program between NC Start and end of program / NC Reset (in seconds).
The timer is cleared after each program start.
The measurement can be activated using channel MD 27860 $MC_PROCESS_TIMER$:
- Bit 1 = 1$AC_CYCLE_TIME$ measurement of current program operating time is active.
The following selection of further measurement conditions is possible:
- Bit 4 = 0No measurement when dryrun feed active
- Bit 4 = 1Measurement even when dryrun feed active
- Bit 5 = 0No measurement during program test
- Bit 5 = 1Measurement even during program test

**Use in NC program:**
IF $AC_CYCLE_TIME$ > 2400 GOTOF ALARM01

<table>
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<th>Axis Identifier</th>
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<th>19.00.00</th>
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</thead>
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<td>write</td>
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<td>X</td>
</tr>
<tr>
<td>Attributes</td>
<td>global</td>
<td>block</td>
</tr>
</tbody>
</table>

Not classified No restrictions
$AC_CUTTING_TIME is used to measure the machining time (in seconds).
This time is defined as the operating time of the path axes (at least one is active)
excluding periods when rapid traverse is active in all NC programs between NC Start and end of program / NC Reset
optionally including/not including active tool.
The measurement is also interrupted whenever a dwell time is active.
The timer is automatically reset each time the control boots with default values.
The measurement can be activated using channel MD 27860 $MC_PROCESS_TIMER:
Bit 2 = $AC_CUTTING_TIME measurement is active.
The following selection of further measurement conditions is possible:
Bit 4 = 0No measurement when dryrun feed active
Bit 4 = 1Measurement even when dryrun feed active
Bit 5 = 0No measurement during program test
Bit 5 = 1Measurement even during program test

Use in NC program:
IF $AC_CUTTING_TIME> 6000 GOTOF ACT_M06
### System variable 01/2008

#### 1.3 Channel-specific system variables

#### `$AC_REQUIRED_PARTS`

**Description:**

$AC_REQUIRED_PARTS can be used to define the number of workpieces which, when reached, causes the number of actual workpieces $AC_ACTUAL_PARTS to be reset (workpiece target).

Channel MD 27880 $MC_PART_COUNTER can be used to activate the display alarm "workpiece target reached" and channel VDI signal "workpiece target reached":

- **Bit 0 = 1:** $AC_REQUIRED_PARTS counter is active

Further meaning of bit 1 only when bit 0 = 1:

- **Bit 1 = 0:** Alarm/VDI output when $AC_ACTUAL_PARTS matches $AC_REQUIRED_PARTS
- **Bit 1 = 1:** Alarm/VDI output when $AC_SPECIAL_PARTS matches $AC_REQUIRED_PARTS

Use in NC program:

```
$AC_REQUIRED_PARTS = ACTUAL_LOS
```

*E.g. for defining a batch size, a daily production output...*

#### `$AC_TOTAL_PARTS`

**Description:**

The $AC_TOTAL_PARTS counter indicates the number of all workpieces machined since the start time.

The counter is incremented by 1 when the MC command defined in channel MD 27882 $MC_PART_COUNTER_MCODE[0] is output to the PLC.

The counter is automatically reset only when the control boots with default values.

Channel MD 27880 $MC_PART_COUNTER can be used to activate the timer:

- **Bit 4 = 1:** $AC_TOTAL_PARTS counter is active

Further meaning of bits 5-6 only when bit 4 = 1:

- **Bit 5 = 0:** The $AC_TOTAL_PARTS counter is incremented by 1 on a VDI output of M02/M30
- **Bit 5 = 1:** The $AC_TOTAL_PARTS counter is incremented by 1 when the M command from MD PART_COUNTER_MCODE[0] is output.
- **Bit 6 = 0:** $AC_TOTAL_PARTS active even during program test/block search
- **Bit 6 = 1:** No processing of $AC_TOTAL PARTS during program test/block search

Use in NC program:

```
IF $AC_TOTAL_PARTS> SERVICE_COUNT GOTOF MARK_END
```

### Table Format

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td><code>$AC_REQUIRED_PARTS</code></td>
<td>Can be used to define the number of workpieces which, when reached, causes the number of actual workpieces $AC_ACTUAL_PARTS to be reset (workpiece target).</td>
</tr>
<tr>
<td><code>$AC_TOTAL_PARTS</code></td>
<td>Indicates the number of all workpieces machined since the start time.</td>
</tr>
</tbody>
</table>

### Table: `$AC_REQUIRED_PARTS`

<table>
<thead>
<tr>
<th>Description</th>
<th>NCK version:</th>
<th>19.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bit 0 = 1:<strong>$AC_REQUIRED_PARTS</strong> counter is active</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Table: `$AC_TOTAL_PARTS`

<table>
<thead>
<tr>
<th>Description</th>
<th>NCK version:</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Further meaning of bit 1 only when bit 0 = 1:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

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SINUMERIK 840D sl/840Di sl/ 840D/ 840Di, List of System Variables (PGA1), 01/2008
1.3 Channel-specific system variables

**DOUBLE**

<table>
<thead>
<tr>
<th>$AC_ACTUAL_PARTS</th>
<th>description:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The $AC_ACTUAL_PARTS counter records the number of all workpieces machined since the start time. When the workpiece target is reached ($AC_REQUIRED_PARTS), the counter is automatically reset ($AC_REQUIRED_PARTS not equal to 0). The counter is incremented by 1 when the MC command defined in channel MD 27882$MC_PART_COUNTER_MCODE[1] is output to the PLC. The counter is automatically reset only when the control boots with default values. Channel MD 27880 $MC_PART_COUNTER can be used to activate the timer: Bit 4 = 1: $AC_TOTAL_PARTS counter is active Further meaning of bits 5-6 only when bit 4 = 1: Bit 5 = 0: The $AC_TOTAL_PARTS counter is incremented by 1 on a VDI output of M02/M30 Bit 5 = 1: The $AC_TOTAL_PARTS counter is incremented by 1 when the M command from MD PART_COUNTER_MCODE[0] is output. Bit 6 = 0:$AC_TOTAL_PARTS active even during program test/block search Bit 6 = 1: No processing of $AC_TOTAL_PARTS during program test/block search Use in NC program: IF $AC_ACTUAL_PARTS == 0 GOTOF NEW_RUN</td>
</tr>
<tr>
<td></td>
<td>axis identifier:</td>
</tr>
<tr>
<td></td>
<td>NCK version: 19.00.00</td>
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<tr>
<td></td>
<td>unit: run-in main run runin slp Mrun syn PP SA OPT OEM access rights</td>
</tr>
<tr>
<td></td>
<td>read: X X X X X X X</td>
</tr>
<tr>
<td></td>
<td>write: X X X X X X 7</td>
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<td></td>
<td>attributes: global block search link</td>
</tr>
<tr>
<td></td>
<td>Not classified No restrictions</td>
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</tbody>
</table>
**DOUBLE $AC_SPECIAL_PARTS**

**description:**
The $AC_SPECIAL_PARTS counter allows the user to apply his own strategy for counting workpieces.
Channel MD 27880 $MC_PART_COUNTER can be used to activate the timer:
Bit 12 = 1: $AC_SPECIAL_PARTS counter is active

Further meaning of bits 13-15 only when bit 12 = 1:
Bit 13 = 0: The $AC_SPECIAL_PARTS counter is incremented by 1 on a VDI output of M02/M30
Bit 13 = 1: The $AC_SPECIAL_PARTS counter is incremented by 1 when the M command from MD PART_COUNTER_MCODE[2] is output.
Bit 14 = 0: $AC_SPECIAL_PARTS active even during program test/block search
Bit 14 = 1: No processing of $AC_SPECIAL_PARTS during program test/block search

**Use in NC program:**
$AC_SPECIAL_PARTS = R20

<table>
<thead>
<tr>
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<th>NCK version:</th>
<th>19.00.00</th>
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<tbody>
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<td>run-in</td>
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<tr>
<td>main run</td>
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<td>X</td>
</tr>
<tr>
<td>runin slop</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>M run syn</td>
<td>X</td>
<td>X</td>
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<tr>
<td>PP</td>
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<td>X</td>
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<td>X</td>
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<tr>
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</tr>
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</table>

**INT $AC_G0MODE**

**description:**
$AC_G0MODE
0: G0 not active
1: G0 and linear interpolation active
2: G0 and non-linear interpolation active.

The response of the path axes to G0 depends on machine data
$MC_G0_LINEAR_MODE (Siemens mode) or $MC_EXTERN_G0_LINEAR_MODE (ISO mode):
With linear interpolation, the path axes traverse together,
With non-linear interpolation, the path axes are traversed as positioning axes.

<table>
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<tr>
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<th>NCK version:</th>
<th>42.00.00</th>
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<td>main run</td>
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<td></td>
</tr>
<tr>
<td>runin slop</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>M run syn</td>
<td>X</td>
<td></td>
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<td>PP</td>
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<tr>
<td>read:</td>
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<td>write:</td>
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<td></td>
</tr>
<tr>
<td>attributes:</td>
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<td></td>
</tr>
</tbody>
</table>
### $AC\_MEAS\_SEMA$

**Description:**
Variable for workpiece and tool measurement.

Variable $AA\_MEAS\_SEMA$ is used to synchronize measuring processes. The variable should be set to 1 before each assignment of the measurement interface and set to 0 when releasing it. Only one measurement interface is available for each channel and should be assigned only if the $AC\_MEAS\_SEMA$ contains the value 0.

**Application:**
```c
if ($AC\_MEAS\_SEMA == 0)
$AC\_MEAS\_SEMA = 1 ; Assign measurement interface
endif
```

**Axis Identifier:**

<table>
<thead>
<tr>
<th>Unit</th>
<th>Min.</th>
<th>Max.</th>
<th>Rights</th>
</tr>
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<tr>
<td>run-in</td>
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<td>runin stp</td>
<td>Mrun syn</td>
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<tr>
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<td>X</td>
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<td>X</td>
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<td>X</td>
</tr>
</tbody>
</table>

**Attributes:**
- Global
- Block
- Search
- Link

### $AC\_MEAS\_LATCH[4]$

**Description:**
Variable for workpiece and tool measurement.

Axial variable $AA\_MEAS\_LATCH[n]$ is used to unlatch all current axis positions with reference to a selected coordinate system. Variable $AC\_MEAS\_P1\_COORD$ is used to select the coordinate system $AC\_MEAS\_P4\_COORD$.

**Application:**
```c
$AA\_MEAS\_LATCH[0] = 1 ; Unlatch 1st measuring point of all axes
$AA\_MEAS\_LATCH[1] = 1 ; Unlatch 2nd measuring point of all axes
$AA\_MEAS\_LATCH[2] = 1 ; Unlatch 3rd measuring point of all axes
$AA\_MEAS\_LATCH[3] = 1 ; Unlatch 4th measuring point of all axes
```

The unlatched measuring point is stored in $AA\_MEAS\_POINT1[ax]$. The description of field limits:
- 0: 1st measuring point, ..., 3: 4th measuring point

**Axis Identifier:**

<table>
<thead>
<tr>
<th>Unit</th>
<th>Min.</th>
<th>Max.</th>
<th>Rights</th>
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**Attributes:**
- Global
- Block
- Search
- Link

Not classified
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<tr>
<td></td>
<td>Variable $AC_MEAS_P1_COORD$ is used to set the coordinate system frame for the 1st measuring point.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Application: $AC_MEAS_P1_COORD = 0$ ; WCS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$AC_MEAS_P1_COORD = 1$ ; BCS</td>
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</tr>
<tr>
<td></td>
<td>$AC_MEAS_P1_COORD = 2$ ; MCS</td>
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<tr>
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<td>Variable $AC_MEAS_P2_COORD$ is used to set the coordinate system frame for the 2nd measuring point.</td>
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<td>Application: $AC_MEAS_P2_COORD = 0$ ; WCS</td>
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<td>$AC_MEAS_P2_COORD = 1$ ; BCS</td>
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</tr>
<tr>
<td></td>
<td>$AC_MEAS_P2_COORD = 2$ ; MCS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$AC_MEAS_P2_COORD = 3$ ; SZS</td>
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<td>axis identifier:</td>
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</tr>
<tr>
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<td>main run</td>
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</table>
1.3 Channel-specific system variables

<table>
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<tr>
<th>INT</th>
<th>$AC_MEAS_P3_COORD</th>
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</tr>
<tr>
<td></td>
<td>Variable $AC_MEAS_P3_COORD is used to set the coordinate system frame for the 3rd measuring point.</td>
<td></td>
</tr>
<tr>
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<td>Application: $AC_MEAS_P3_COORD = 0 ; WCS</td>
<td></td>
</tr>
<tr>
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<td></td>
</tr>
<tr>
<td></td>
<td>$AC_MEAS_P3_COORD = 2 ; MCS</td>
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</tr>
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<td></td>
<td>$AC_MEAS_P3_COORD = 3 ; SZS</td>
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<tr>
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<tr>
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<table>
<thead>
<tr>
<th>INT</th>
<th>$AC_MEAS_P4_COORD</th>
<th>description:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Variable for workpiece and tool measurement.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Variable $AC_MEAS_P4_COORD is used to set the coordinate system frame for the 4th measuring point.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Application: $AC_MEAS_P4_COORD = 0 ; WCS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$AC_MEAS_P4_COORD = 1 ; BCS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$AC_MEAS_P4_COORD = 2 ; MCS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$AC_MEAS_P4_COORD = 3 ; SZS</td>
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</tr>
<tr>
<td></td>
<td>axis identifier: NCK version: 50.00.00</td>
<td></td>
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<tr>
<td></td>
<td>unit: - min.: 0 max.: 3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>run-in main run runin stp Mrun syn PP SA OPI OEM access rights</td>
<td></td>
</tr>
<tr>
<td>read:</td>
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<td></td>
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<tr>
<td>write:</td>
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<tr>
<td></td>
<td>Not classified not classified</td>
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</tr>
</tbody>
</table>
### Variable $AC\_MEAS\_SET\_COORD$

**Description:**
Variable $AC\_MEAS\_SET\_COORD$ is used to set the coordinate system for the position setpoint.

**Application:**
- $AC\_MEAS\_SET\_COORD = 0$ ; WCS
- $AC\_MEAS\_SET\_COORD = 1$ ; BCS
- $AC\_MEAS\_SET\_COORD = 2$ ; MCS
- $AC\_MEAS\_SET\_COORD = 3$ ; SZS

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
<th>NCK Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>$AC_MEAS_SET_COORD$</td>
<td>Variable for workpiece and tool measurement.</td>
<td>50.00.00</td>
</tr>
</tbody>
</table>

#### Axes Identification
- **Unit:** Int
- **Min.:** 0
- **Max.:** 3

<table>
<thead>
<tr>
<th>Run-in</th>
<th>Main Run</th>
<th>Runin Snap</th>
<th>Miss Run</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>Access Rights</th>
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<tbody>
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<td>X</td>
</tr>
</tbody>
</table>

#### Attributes
- Global
- Block
- Search
- Link
- Not classified
- Not classified

### Variable $AC\_MEAS\_WP\_SET\_ANGLE$

**Description:**
Axial variable $AA\_MEAS\_WP\_SET\_ANGLE$ is used to define an angle setpoint for the workpiece position.

**Axes Identification**
- **Unit:** Deg.
- **Min.:** DBL_MIN
- **Max.:** DBL_MAX

<table>
<thead>
<tr>
<th>Run-in</th>
<th>Main Run</th>
<th>Runin Snap</th>
<th>Miss Run</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>Access Rights</th>
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<tr>
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</tr>
</tbody>
</table>

#### Attributes
- Global
- Block
- Search
- Link
- Not classified
- Not classified

### Variable $AC\_MEAS\_CORNER\_SET\_ANGLE$

**Description:**
Variable $AA\_MEAS\_CORNER\_SET\_ANGLE$ is used to define an angle setpoint for the corner of a workpiece.

**Axes Identification**
- **Unit:** Deg.
- **Min.:** DBL_MIN
- **Max.:** DBL_MAX

<table>
<thead>
<tr>
<th>Run-in</th>
<th>Main Run</th>
<th>Runin Snap</th>
<th>Miss Run</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
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</tr>
</tbody>
</table>

#### Attributes
- Global
- Block
- Search
- Link
- Not classified
- Not classified
### $AC_MEAS_DIR_APPROACH

**Variable for workpiece and tool measurement.**

Variable $AC_MEAS_DIR_APPROACH is used to define the direction of approach to the workpiece.

The following values are possible:

- 0: +x
- 1: -x
- 2: +y
- 3: -y
- 4: +z
- 5: -z

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>unit:</th>
<th>NCK version:</th>
<th>43.00.00</th>
<th>read:</th>
<th>write:</th>
<th>attributes:</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
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<td>global</td>
<td>Not classified</td>
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</table>

### $AC_MEAS_ACT_PLANE

**Variable for workpiece and tool measurement.**

Variable $AC_MEAS_ACT_PLANE is used to define the working plane. The working plane is needed in order to define the tool orientation.

The following values are possible:

- 0: G17 working plane x/y infeed direction z
- 1: G18 working plane z/x infeed direction y
- 2: G19 working plane y/z infeed direction x

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>unit:</th>
<th>NCK version:</th>
<th>43.00.00</th>
<th>read:</th>
<th>write:</th>
<th>attributes:</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>global</td>
<td>Not classified</td>
</tr>
</tbody>
</table>

### §AC_MEAS_FINE_TRANS

**description:**
Variable for workpiece and tool measurement.

When measuring workpieces, translation offsets can be entered in the fine offset component of the selected frame. Variable §AC_MEAS_FINE_TRANS is used for this purpose.

The following values are possible:
0: Translation offset is entered in coarse offset
1: Translation offset is entered in fine offset

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>NCK version: 45.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>min.</td>
<td>max.</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
</tr>
<tr>
<td>read</td>
<td>write</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
</tr>
<tr>
<td>read</td>
<td>write</td>
</tr>
</tbody>
</table>

**attributes:**
global | block | search | link

### §AC_MEAS_FRAME_SELECT

**description:**
Variable for workpiece and tool measurement.

Variable §AC_MEAS_FRAME_SELECT is used to select the frame in which the calculated frame is entered.

The following values are possible:
0:$P_SETFRAME
1:$P_PARTFRAME
2:$P_EXTFRAME
10..25:$P_CHBFRAME[0..15]
50..65:$P_NCBFRAME[0..15]
100,199:$P_IFRAME
500:$P_TOOLFRAME
501:$P_WPFRAME
502:$P_TRAFRAME
503:$P_PFRAME
504:$P_CYCFRAME
505: $P_RELFRAME (PCS)
506: $P_RELFRAME (ACS)
1010..1025: $P_CHBFRAME[0..15], when G500 is active
1050..1065: $P_NCBFRAME[0..15], when G500 is active
2000: $P_SETFR
2001:$P_PARTFR
2002:$P_EXTFR
2010..2025: $P_CHBFR[0..15]
2050..2065: $P_NCBFR[0..15]
2100..2199: $P_UIFR[0..99]
2500:$P_TOOLFR
2501:$P_WPFR
2502:$P_TRAFR
2504:$P_CYCFR
### 1.3 Channel-specific system variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>$P_RELFR\ (PCS)$</td>
<td>Variable for workpiece and tool measurement.</td>
</tr>
<tr>
<td>$P_RELFR\ (ACS)$</td>
<td>Variable $P_RELFR\ (PCS)$ is used to select the frame in which the calculated frame is entered.</td>
</tr>
<tr>
<td>$P_CHBFR[0..15]\ (G500)$</td>
<td>The following values are possible:</td>
</tr>
<tr>
<td></td>
<td>0: $P_SETFRAME$</td>
</tr>
<tr>
<td></td>
<td>1: $P_PARTFRAME$</td>
</tr>
<tr>
<td></td>
<td>2: $P_EXTFRAME$</td>
</tr>
</tbody>
</table>

**INT $AC\_MEAS\_FRAME\_SELECT**

Description:
Variable $AC\_MEAS\_FRAME\_SELECT$ is used to select the frame in which the calculated frame is entered.

The following values are possible:
0: $P\_SETFRAME$
1: $P\_PARTFRAME$
2: $P\_EXTFRAME$

**INT $AC\_MEAS\_CHSFR**

Description:
Variable $AC\_MEAS\_CHSFR$ can be used to define the composition of the desired frame chain. The value of the variable should be selected according to the system frame bitmask $MC\_MM\_SYSTEM\_FRAME\_MASK$.

Application:
$AC\_MEAS\_CHSFR = 'B1001'$

Only the system frames for preset actual value and TOROT are included in the calculation of the new overall frame.
### 1.3 Channel-specific system variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>$AC_MEAS_NCBFR</td>
<td>Variable for workpiece and tool measurement. In order to convert a position from one coordinate system to another, $AC_MEAS_NCBFR can be used to define the composition of the desired frame chain. The value of the variable should be interpreted as a bitmask from 0x0 to 0xFFFF for the global basic frames (up to 16 frames in total). Application: $AC_MEAS_NCBFR = 'B11' Only the first two global basic frames are included in the calculation of the new overall frame.</td>
<td></td>
</tr>
<tr>
<td>$AC_MEAS_CHBFR</td>
<td>Variable for workpiece and tool measurement. In order to convert a position from one coordinate system to another, $AC_MEAS_CHBFR can be used to define the composition of the desired frame chain. The value of the variable should be interpreted as a bitmask from 0x0 to 0xFFFF for the channel basic frames (up to 16 frames in total). Application: $AC_MEAS_CHBFR = 'B11' Only the first two channel basic frames are included in the calculation of the new overall frame.</td>
<td></td>
</tr>
</tbody>
</table>
### 1.3 Channel-specific system variables

#### $\$AC\_MEAS\_UIFR$

**description:**
Variable for workpiece and tool measurement.

In order to convert a position from one coordinate system to another, \$AC\_MEAS\_UIFR can be used to define the composition of the desired frame chain. The variable range for the settable frames is from 0 to 99 (up to 100 in total).

**Application:**
\$AC\_MEAS\_UIFR = 1
The G54 frame is included in the calculation of the new overall frame.

<table>
<thead>
<tr>
<th>unit:</th>
<th>min.:</th>
<th>max.:</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
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</table>

<table>
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<tr>
<th>axis identifier:</th>
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</thead>
<tbody>
<tr>
<td>read:</td>
<td>X</td>
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</tr>
<tr>
<td>write:</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

**attributes:**
Not classified

#### $\$AC\_MEAS\_PFRAME$

**description:**
Variable for workpiece and tool measurement.

In order to convert a position from one coordinate system to another, \$AC\_MEAS\_PFRAME can be used to define the composition of the desired frame chain.

The following values are allowed:
\$AC\_MEAS\_PFRAME = 1 ; Programmable frame is not included in calculation
\$AC\_MEAS\_PFRAME = 0 ; Programmable frame is included in calculation

<table>
<thead>
<tr>
<th>unit:</th>
<th>min.:</th>
<th>max.:</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
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<table>
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<tbody>
<tr>
<td>read:</td>
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<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td>X</td>
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</table>

**attributes:**
Not classified
### $AC_MEAS_T_NUMBER

**description:**
Variable for workpiece and tool measurement. Variable $AC_MEAS_T_NUMBER is used to select the tool for workpiece and tool measurement. The tool number of the active tool must match the selected tool. The active tool is included in the calculation when T0 is selected. If no tool is selected, the tool selected by $AC_MEAS_T_NUMBER is used in the calculation.

**axis identifier:**
NCK version: 43.00.00

<table>
<thead>
<tr>
<th>unit</th>
<th>min.</th>
<th>max.</th>
<th>run-in</th>
<th>main run</th>
<th>runin sip</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>read</td>
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<tr>
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<td>block search</td>
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</tr>
</tbody>
</table>

### $AC_MEAS_TOOL_MASK

**description:**
Variable for workpiece and tool measurement. Variable $AC_MEAS_TOOL_MASK specifies the tool position and considers the tool lengths for workpiece and tool measurement.

The following values are possible:
- 0x0: Default setting; all tool lengths are included
- 0x1: The radius of the tool is not included in the calculation
- 0x2: The tool position is in the x direction (G19)
- 0x4: The tool position is in the y direction (G18)
- 0x8: The tool position is in the z direction (G17)
- 0x10: The length of the tool is not included in the calculation.

Whether or not the radius of a milling tool is included in the calculation is determined from the tool position and direction of approach. If the direction of approach is not specified explicitly, it is derived from the selected plane. The direction of approach is in -z for G17, -y for G18 and -x for G19.

**axis identifier:**
NCK version: 50.00.00

<table>
<thead>
<tr>
<th>unit</th>
<th>min.</th>
<th>max.</th>
<th>run-in</th>
<th>main run</th>
<th>runin sip</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
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<th>access rights</th>
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<tbody>
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<td></td>
<td></td>
<td></td>
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</tbody>
</table>
### 1.3 Channel-specific system variables

#### $AC_MEAS_D_NUMBER

| Description: | Variable for workpiece and tool measurement. Variable $AC_MEAS_D_NUMBER is used to select the tool cutting edge for workpiece and tool measurement. The tool cutting edge number of the active tool must match the selected cutting edge. The active cutting edge is included in the calculation when D0 is selected. If no tool is selected, the cutting edge selected by $AC_MEAS_D_NUMBER is used in the calculation. |

<table>
<thead>
<tr>
<th>Axis identifier:</th>
<th>NCK version: 43.00.00</th>
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<td>X X</td>
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<tr>
<td>Write: X</td>
<td>X X 7</td>
</tr>
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<td>Attributes: global block search link</td>
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</tr>
<tr>
<td>Not classified</td>
<td></td>
</tr>
</tbody>
</table>

#### $AC_MEAS_TYPE

| Description: | Variable for workpiece and tool measurement. Variable $AC_MEAS_TYPE is used to select the type of measurement. The following values are possible: 0: Default setting 1: x edge 2: y edge 3: z edge 4: Corner 1 5: Corner 2 6: Corner 3 7: Corner 4 8: Hole 9: Shaft 10: Tool length 11: Tool diameter 12: Groove 13: Web 14: Preset actual value memory for geo and special axes 15: Preset actual value memory for special axes only 16: Inclined edge 17: Plane_Angles (2 solid angles in one plane) 18: Plane_Normal (3 solid angles in one plane with specified setpoint) 19: Dimension_1 (1-dimensional setpoint specification) 20: Dimension_2 (2-dimensional setpoint specification) 21: Dimension_3 (3-dimensional setpoint specification) 22: ToolMagnifier (ShopTurn: Measurement of tool lengths with magnifier) 23: ToolMarkedPos (ShopTurn: Measurement of a tool length with marked position) 24: Coordinate transformation of a position 25: Rectangle |

| Description: | |
### 1.3 Channel-specific system variables

#### $AC\_MEAS\_VALID$

| Description: |
| Variable for workpiece and tool measurement. |
| Variable $AC\_MEAS\_VALID$ is used to define which system variables are valid for the current measurement. The value should be set to 0 before every measurement. |
| The individual bits are set implicitly when the corresponding variables are written. |
| Bit 0: $AA\_MEAS\_POINT1[axis]$ |
| Bit 1: $AA\_MEAS\_POINT2[axis]$ |
| Bit 2: $AA\_MEAS\_POINT3[axis]$ |
| Bit 3: $AA\_MEAS\_POINT4[axis]$ |
| Bit 4: $AA\_MEAS\_SETPOINT[axis]$ |
| Bit 5: $AC\_MEAS\_WP\_SETANGLE$ |
| Bit 6: $AC\_MEAS\_CORNER\_SETANGLE$ |
| Bit 7: $AC\_MEAS\_T\_NUMBER$ |
| Bit 8: $AC\_MEAS\_D\_NUMBER$ |
| Bit 9: $AC\_MEAS\_DIR\_APPROACH$ |
| Bit 10: $AC\_MEAS\_ACT\_PLANE$ |
| Bit 11: $AC\_MEAS\_FRAME\_SELECT$ |
| Bit 12: $AC\_MEAS\_TYPE$ |
| Bit 13: $AC\_MEAS\_FINE\_TRANS$ |
| Bit 14: $AA\_MEAS\_SETANGLE[axis]$ |
| Bit 15: $AC\_MEAS\_SCALEUNIT$ |
| Bit 16: $AC\_MEAS\_TOOL\_MASK$ |
| Bit 17: $AC\_MEAS\_P1\_COORD$ |
| Bit 18: $AC\_MEAS\_P2\_COORD$ |
| Bit 19: $AC\_MEAS\_P3\_COORD$ |
| Bit 20: $AC\_MEAS\_P4\_COORD$ |
| Bit 21: $AC\_MEAS\_SET\_COORD$ |
| Bit 22: $AC\_MEAS\_CHSFR$ |
| Bit 23: $AC\_MEAS\_NCBF$ |
| Bit 24: $AC\_MEAS\_CHBF$ |
| Bit 25: $AC\_MEAS\_UIFR$ |
| Bit 26: $AC\_MEAS\_PFRAME$ |
### 1.3 Channel-specific system variables

**FRAME** 

**$AC_MEAS_FRAME**

<table>
<thead>
<tr>
<th>description:</th>
<th>Variable for workpiece and tool measurement.</th>
</tr>
</thead>
<tbody>
<tr>
<td>$AC_MEAS_FRAME** is the result frame for workpiece measurement. This frame is calculated by the <code>MEASURE()</code> function or a PI service and is not part of the active frame chain. The calculated result frame can then be copied into the selected frame ($AC_MEAS_FRAME_SELECT) by the part program or a further PI service.</td>
<td></td>
</tr>
<tr>
<td>axis identifier:</td>
<td>NCK version: 43.00.00</td>
</tr>
<tr>
<td>unit:</td>
<td>DBL_MIN</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
</tr>
<tr>
<td>read:</td>
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<tr>
<td>write:</td>
<td>X</td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
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<td>Not classified</td>
</tr>
</tbody>
</table>

**DOUBLE** 

**$AC_MEAS_WP_ANGLE**

<table>
<thead>
<tr>
<th>description:</th>
<th>Variable for workpiece and tool measurement.</th>
</tr>
</thead>
<tbody>
<tr>
<td>$AC_MEAS_WP_ANGLE is the calculated workpiece position angle for workpiece measurement. The value specifies the relative position of the workpiece in the workpiece coordinate system (WCS).</td>
<td></td>
</tr>
<tr>
<td>axis identifier:</td>
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<tr>
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<td>attributes:</td>
<td>global</td>
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<td>Not classified</td>
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</table>

**DOUBLE** 

**$AC_MEAS_CORNER_ANGLE**

<table>
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<tr>
<th>description:</th>
<th>Variable for workpiece and tool measurement.</th>
</tr>
</thead>
<tbody>
<tr>
<td>$AC_MEAS_CORNER_ANGLE is the calculated cutting angle of the corner for workpiece measurement.</td>
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### DOUBLE $AC\_MEAS\_DIAMETER$

**Description:**
Variable for workpiece and tool measurement. 

Variable $AC\_MEAS\_DIAMETER$ is the calculated diameter for tool measurement.

<table>
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<tr>
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<th>Main Run</th>
<th>Runin Stp</th>
<th>Mrun Syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>Access Rights</th>
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**Attributes:**
- Global
- Block search
- Link

### DOUBLE $AC\_MEAS\_TOOL\_LENGTH$

**Description:**
Variable for workpiece and tool measurement. 

Variable $AC\_MEAS\_TOOL\_LENGTH$ is the calculated tool length for tool measurement.

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**Attributes:**
- Global
- Block search
- Link

### DOUBLE $AC\_MEAS\_RESULTS[10]$

**Description:**
Variable for workpiece and tool measurement. 

Array variable $AC\_MEAS\_RESULTS[n]$ contains the calculation results. The measurement type ($AC\_MEAS\_TYPE$) determines which elements of the array are written.

**Description of Field Limits:**
Measurement results

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<th>Unit</th>
<th>Min.</th>
<th>Max.</th>
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**Attributes:**
- Global
- Block search
- Link

Not classified
Not classified
### 1.3 Channel-specific system variables

#### $\$AC\_MEAS\_SCALEUNIT$

| Description: | Variable for workpiece and tool measurement. $\$AC\_MEAS\_SCALEUNIT$ defines the unit of measurement according to the configuration for input and output values.
|---|---|
| The following values are possible: | 0: Unit of measurement as configured (default setting)  
1: Unit of measurement with reference to active G code is INCH: G70/G700 METRIC: G71/G710 |
| Axis identifier: | NCK version: 48.00.00 |
| Unit: | run-in | main run | runin stp | Mrun syn | PP | SA | OPI | OEM | access rights |
| read: | X | X | | | | | | | |
| write: | X | X | | | | | | | |
| Attributes: | global block search | link |
| Role: | Not classified | Not classified |

#### $\$P\_CHANNO$

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<td>Attributes:</td>
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#### $\$AC\_SERUPRO$

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<th>Interrogate whether search type Serupro is active. (Serupro: &quot;Block search via program test&quot;) Can be used in Synacts and the part program</th>
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</thead>
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<td>$$AC_SERUPRO == 0$</td>
<td>Search type Serupro is not active</td>
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<tr>
<td>$$AC_SERUPRO == 1$</td>
<td>Search type Serupro is active</td>
</tr>
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<tr>
<td>Unit:</td>
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<tr>
<td>read:</td>
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<td>write:</td>
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### $AC_VACTBF

**Description:**
$AC_VACTBF$ supplies the path velocity in the basic coordinate system. FGroup and FGREF are taken into account.

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<th>Max.</th>
<th>Read</th>
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</thead>
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<tr>
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<td>55.00.00</td>
<td>Linear / angular speed</td>
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**Attributes:**
- Global
- Block search
- Link

Not classified

### $AC_VACTWF

**Description:**
Path velocity in workpiece coordinate system. FGROUP and FGREF are taken into account.

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<td>Linear / angular speed</td>
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**Attributes:**
- Global
- Block search
- Link

Not classified

### $P_CHBFR0

**Description:**
Access to 1st channel basic frame. Corresponds to $P_CHBFR[0]$.

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**Attributes:**
- Global
- Block search
- Link

Not classified

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SINUMERIK 840D sl/840Di sl/ 840D/ 840Di, List of System Variables (PGA1), 01/2008
### $P\_CHBFR1$

**Description:**

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<td>DBL_MAX</td>
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<td>runin</td>
<td>Mrun syn</td>
<td>PP</td>
<td>SA</td>
</tr>
<tr>
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<td>Mrun syn</td>
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<td>Mrun syn</td>
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<td>Read:</td>
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<td></td>
</tr>
<tr>
<td>Write:</td>
<td>X</td>
<td></td>
<td>X</td>
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1 System variable

1.3 Channel-specific system variables

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### 1.3 Channel-specific system variables

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<td>max.:</td>
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| Write: | X | 7 |

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| Write: | X | 7 |

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| Write: | X | 7 |

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Access to 1st NCU-global basic frame. Corresponds to $P_{NCBFR}[0].$

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<td></td>
</tr>
<tr>
<td><strong>Main Run</strong></td>
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</tr>
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### FRAME $P_{NCBFR1}$

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Access to 2nd NCU-global basic frame. Corresponds to $P_{NCBFR}[1].$

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### FRAME $P_{NCBFR2}$

**Description:**
Access to 3rd NCU-global basic frame. Corresponds to $P_{NCBFR}[2].$

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Not classified No restrictions
### FRAME: $P_{NCBFR3}$

**Description:**
Access to 4th NCU-global basic frame. Corresponds to $P_{NCBFR}[3]$.

**Axis Identifier:**
- GEOAX
- CHANAX
- MACHAX

**Unit:**
- Run-in: DBL_MIN
- Main Run: DBL_MAX
- Run-in & Stop: DBL_MIN
- Mrun Syn: DBL_MAX

**Access Rights:**
- Read: X
- Write: X

**Attributes:**
- Global
- Block Search
- Link

**Access Rights:**
- Not classified
- No restrictions

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### FRAME: $P_{NCBFR4}$

**Description:**
Access to 5th NCU-global basic frame. Corresponds to $P_{NCBFR}[4]$.

**Axis Identifier:**
- GEOAX
- CHANAX
- MACHAX

**Unit:**
- Run-in: DBL_MIN
- Main Run: DBL_MAX
- Run-in & Stop: DBL_MIN
- Mrun Syn: DBL_MAX

**Access Rights:**
- Read: X
- Write: X

**Attributes:**
- Global
- Block Search
- Link

**Access Rights:**
- Not classified
- No restrictions

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### FRAME: $P_{NCBFR5}$

**Description:**
Access to 6th NCU-global basic frame. Corresponds to $P_{NCBFR}[5]$.

**Axis Identifier:**
- GEOAX
- CHANAX
- MACHAX

**Unit:**
- Run-in: DBL_MIN
- Main Run: DBL_MAX
- Run-in & Stop: DBL_MIN
- Mrun Syn: DBL_MAX

**Access Rights:**
- Read: X
- Write: X

**Attributes:**
- Global
- Block Search
- Link

**Access Rights:**
- Not classified
- No restrictions
### $P_{NCBFR6}$

**Description:**
Access to 7th NCU-global basic frame. Corresponds to $P_{NCBFR}[6]$.

**Axis Identifier:**
- GEOAX
- CHANAX
- MACHAX

**Unit:**
- run-in: -
- main run: -
- runin stp: -
- Mrun syn: -
- PP: -
- SA: -
- OPI: -
- OEM: -

**Run-in Main Run Runin Stp Mrun Syn Pp Sa Opi Oem Access Rights:**
- read: X
- write: X

**Attributes:**
- Not classified
- No restrictions

**NCK Version:** 56.00.00

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### $P_{NCBFR7}$

**Description:**
Access to 8th NCU-global basic frame. Corresponds to $P_{NCBFR}[7]$.

**Axis Identifier:**
- GEOAX
- CHANAX
- MACHAX

**Unit:**
- run-in: -
- main run: -
- runin stp: -
- Mrun syn: -
- PP: -
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- OEM: -

**Run-in Main Run Runin Stp Mrun Syn Pp Sa Opi Oem Access Rights:**
- read: X
- write: X

**Attributes:**
- Not classified
- No restrictions

**NCK Version:** 56.00.00

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### $P_{NCBFR8}$

**Description:**
Access to 9th NCU-global basic frame. Corresponds to $P_{NCBFR}[8]$.

**Axis Identifier:**
- GEOAX
- CHANAX
- MACHAX

**Unit:**
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- main run: -
- runin stp: -
- Mrun syn: -
- PP: -
- SA: -
- OPI: -
- OEM: -

**Run-in Main Run Runin Stp Mrun Syn Pp Sa Opi Oem Access Rights:**
- read: X
- write: X

**Attributes:**
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- No restrictions

**NCK Version:** 56.00.00
### 1.3 Channel-specific system variables

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- GEOAX
- CHANAX
- MACHAX

**NCK version:** 56.00.00

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**Run-in:**
- main run
- runin stp
- Mrun syn
- PP
- SA
- OPI
- OEM

**Access rights:**
- read: XX
- write: XX 7

**Attributes:**
- global
- block search
- link

Not classified No restrictions

**FRAME \$P\_NCBFR13**

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**Axis identifier:**
- GEOAX
- CHANAX
- MACHAX

**NCK version:** 56.00.00

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**Run-in:**
- main run
- runin stp
- Mrun syn
- PP
- SA
- OPI
- OEM

**Access rights:**
- read: XX
- write: XX 7

**Attributes:**
- global
- block search
- link

Not classified No restrictions

**FRAME \$P\_NCBFR14**

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**Axis identifier:**
- GEOAX
- CHANAX
- MACHAX

**NCK version:** 56.00.00

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**Run-in:**
- main run
- runin stp
- Mrun syn
- PP
- SA
- OPI
- OEM

**Access rights:**
- read: XX
- write: XX 7

**Attributes:**
- global
- block search
- link

Not classified No restrictions
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### 1 System variable

#### 1.3 Channel-specific system variables

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### 1.3 Channel-specific system variables

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attributes: global block search link

Not classified No restrictions

### FRAME: $P_{NCBFRAME2}$

**description:** Access to 3rd current NCU-global basic frame. Corresponds to $P_{NCBFRAME}[2]$.

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<th>runin run</th>
<th>Mrun syn</th>
<th>PP</th>
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<th>OPI</th>
<th>OEM</th>
<th>access rights</th>
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attributes: global block search link

Not classified No restrictions

### FRAME: $P_{NCBFRAME3}$

**description:** Access to 4th current NCU-global basic frame. Corresponds to $P_{NCBFRAME}[3]$.

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attributes: global block search link

Not classified No restrictions
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<td>Write</td>
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**Attributes:**
Not classified
No restrictions

### Frame: $P\_NCBFRA M E 5$

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No restrictions

### Frame: $P\_NCBFRA M E 6$

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<td>Write</td>
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**Attributes:**
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No restrictions
### 1.3 Channel-specific system variables

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### Channel-specific system variables

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</tr>
<tr>
<td>Max.:</td>
<td>DBL_MAX</td>
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<tr>
<td>Run-in</td>
<td>main run runin stp Mrun syn PP SA OPI OEM access rights</td>
</tr>
<tr>
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</tr>
<tr>
<td>Write:</td>
<td>X</td>
</tr>
<tr>
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#### FRAME: $P_{NCBFRAME11}$

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<td>Unit:</td>
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<td>Min.:</td>
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<tr>
<td>Max.:</td>
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<tr>
<td>Run-in</td>
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</tr>
<tr>
<td>Read:</td>
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#### FRAME: $P_{NCBFRAME12}$

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<td>Max.:</td>
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### 1.3 Channel-specific system variables

**FRAME: $P_NCBFRAME13**

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**FRAME: $P_NCBFRAME14**

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<th>OPT</th>
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<th>runin stp</th>
<th>Mrun syn</th>
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<th>OPT</th>
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### 1.3 Channel-specific system variables

#### INT $P\_TRAFO\_CHAIN[\text{MAX\_CONCAT\_ENATED\_TRAfos}]$

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</tr>
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<tr>
<td>write: Not classified</td>
</tr>
<tr>
<td>attributes: global block search link</td>
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<tr>
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</table>

**description:** $P\_TRAFO\_CHAIN[n]$

Code numbers of chained transformations of programmed TRACON according to machine data $MC\_TRAFO\_TYPE\_m$.

Supplies the code number of the nth chained transformation of the programmed TRACON, starting with $n=0$.

$P\_TRAFO\_CHAIN[0]$ is the 1st chained transformation if a TRACON is programmed. If a TRACON command is not programmed, the code number of the programmed transformation is returned (e.g. 257 for TRANSMIT). If there is no transformation programmed, the value '0' is returned.

$P\_TRAFO\_CHAIN[1]$ is the 2nd chained transformation if a TRACON is programmed. Otherwise a '0' is returned.


#### INT $AC\_TRAFO\_CHAIN[\text{MAX\_CONCAT\_ENATED\_TRAfos}]$

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<td>unit: min.: 0 max.: INT_MAX</td>
</tr>
<tr>
<td>run-in main run runin stp Mrun syn PP SA OPI OEM access rights</td>
</tr>
<tr>
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<tr>
<td>write: Not classified</td>
</tr>
<tr>
<td>attributes: global block search link</td>
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</table>

**description:** $AC\_TRAFO\_CHAIN[n]$

Code numbers of chained transformations of active TRACON according to machine data $MC\_TRAFO\_TYPE\_m$.

Supplies the code number of the nth chained transformation of the active TRACON, starting with $n=0$.

$AC\_TRAFO\_CHAIN[0]$ is the 1st chained transformation if a TRACON is programmed. If a TRACON command is not active, the code number of the programmed transformation is returned (e.g. 257 for TRANSMIT). If no transformation is active, the value '0' is returned.

$AC\_TRAFO\_CHAIN[1]$ is the 2nd chained transformation if a TRACON is active. Otherwise a '0' is returned.

### 1.3 Channel-specific system variables

**$AC_MEAS_INPUT[10]$**

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<th>Variable for workpiece and tool measurement. Array variable $AC_MEAS_INPUT[n]$ is used to enter measuring input parameters for workpiece and tool measurement. The control effect of the parameters is documented in the measurement variants.</th>
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<tr>
<td><strong>Run-in:</strong></td>
<td>main run run in Mrun syn PP SA OPT OEM access rights</td>
</tr>
<tr>
<td><strong>Read:</strong></td>
<td>X X X</td>
</tr>
<tr>
<td><strong>Write:</strong></td>
<td>X X X 7</td>
</tr>
<tr>
<td><strong>Attributes:</strong></td>
<td>global block search link</td>
</tr>
<tr>
<td></td>
<td>Not classified Not classified</td>
</tr>
</tbody>
</table>

**$A_DBSB[1024]$**

<table>
<thead>
<tr>
<th>Description:</th>
<th>Array variable $A_DBSB[n]$ is used to read and write a data byte (8 bits) from PLC. The byte is signed and can be read and written in the range from -128 to 127. A memory area is reserved in the communications buffer of these modules (DPR) for high-speed data exchange between PLC and NC. The PLC uses function calls (FC) and the NCK uses $ variables to access this memory. See also $A_DBB[n]$.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description of field limits:</strong></td>
<td>n: Position offset within I/O area 0 - ...</td>
</tr>
<tr>
<td><strong>Axis Identifier:</strong></td>
<td>NCK version: 58.00.00</td>
</tr>
<tr>
<td><strong>Unit:</strong></td>
<td>-</td>
</tr>
<tr>
<td><strong>Min.:</strong></td>
<td>-128</td>
</tr>
<tr>
<td><strong>Max.:</strong></td>
<td>127</td>
</tr>
<tr>
<td><strong>Run-in:</strong></td>
<td>main run run in Mrun syn PP SA OPT OEM access rights</td>
</tr>
<tr>
<td><strong>Read:</strong></td>
<td>X X X X</td>
</tr>
<tr>
<td><strong>Write:</strong></td>
<td>X X X X X 7</td>
</tr>
<tr>
<td><strong>Attributes:</strong></td>
<td>global block search link</td>
</tr>
<tr>
<td></td>
<td>Not classified Not classified</td>
</tr>
</tbody>
</table>
### $A_DBSW[1024]

**Description:**
Array variable $A_DBSW[n]$ is used to read and write a data word (16 bits) from PLC. The word is signed and can be read and written in the range from -32768 to 32767.

A memory area is reserved in the communications buffer of these modules (DPR) for high-speed data exchange between PLC and NC. The PLC uses function calls (FC) and the NCK uses $ variables to access this memory.

See also $A_DBW[n]$.

**Field limits description:**
- **n:** Position offset within I/O area 0 - ...

**Axis identifier:**
- **NCK version:** 58.00.00
  - **unit:** -
  - **min.:** -32768
  - **max.:** 32767
- **run-in:**
  - **main run:**
  - **runin slip:**
  - **Mrun syn:**
  - **PP:**
  - **SA:**
  - **OPT:**
  - **OEM:**
  - **access rights:**
  - **read:**
  - **write:**
  - **attributes:**
    - **global**
    - **block search**
    - **link**

<table>
<thead>
<tr>
<th>run-in</th>
<th>main run</th>
<th>runin slip</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
<th>read</th>
<th>write</th>
<th>attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

**Attributes:**
- **Not classified**
- **Not classified**

### $P_SUB_AXFCT

**Description:**
Returns a bitmask according to machine data $MA_AXIS_LANG_SUB_MASK. An enabled bit means that the substitution of the corresponding function is active:

- Bit 0 = 1: Automatic gear stage change (M40) and direct gear stage change (M41-M45)
- Bit 1 = 1: Spindle positioning with SPOS/SPOSA/M19

**Axis identifier:**
- **NCK version:** 58.00.00
  - **unit:** -
  - **min.:** 0
  - **max.:** 3
- **run-in:**
  - **main run:**
  - **runin slip:**
  - **Mrun syn:**
  - **PP:**
  - **SA:**
  - **OPT:**
  - **OEM:**
  - **access rights:**
  - **read:**
  - **write:**

<table>
<thead>
<tr>
<th>run-in</th>
<th>main run</th>
<th>runin slip</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
<th>read</th>
<th>write</th>
<th>attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Attributes:**
- **Program sensitive**
- **No restrictions**
### 1.3 Channel-specific system variables

#### INT

- **$P\_SUB\_GEAR**
  - Description: Returns the programmed or calculated gear stage in the substitution subprogram of an NC language substitution configured with $MA\_AXIS\_LANG\_SUB\_MASK. Outside the substitution subprogram, the variable returns the gear stage of the master spindle.
  - NCK version: 58.00.00
  - Axis identifier: NCK version: 58.00.00
  - Unit: -
  - Min.: 41
  - Max.: 45
  - Read: X
  - Write: X
  - Attributes: global, block search, link
  - Program sensitive
  - No restrictions

#### BOOL

- **$P\_SUB\_AUTOGEAR**
  - Description: Indicates whether an automatic gear stage change (M40) was active in the part program line which initiated the substitution process. Outside the substitution process, the variable returns the current setting in the interpreter.
  - NCK version: 58.00.00
  - Axis identifier: NCK version: 58.00.00
  - Unit: -
  - Min.: FALSE
  - Max.: TRUE
  - Read: X
  - Write: X
  - Attributes: global, block search, link
  - Program sensitive
  - No restrictions

#### AXIS

- **$P\_SUB\_LA**
  - Description: Supplies the axis identifier of the leading spindle of the active coupling which initiated the substitution process. Outside the substitution process, the variable aborts program execution and triggers an alarm.
  - NCK version: 58.00.00
  - Axis identifier: NCK version: 58.00.00
  - Unit: -
  - Min.: max.: -
  - Read: X
  - Write: X
  - Attributes: global, block search, link
  - Program sensitive
  - No restrictions
### AXIS

**$P\_SUB\_CA**

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>In the substitution subprogram of an NC language substitution configured with $MA_AXIS_LANG_SUB_MASK, this variable supplies the axis identifier of the following spindle of the active coupling which initiated the substitution process. Outside the substitution process, the variable aborts program execution and triggers an alarm.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Axis identifier:</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCK version: 58.00.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit:</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
</tr>
<tr>
<td>main run</td>
</tr>
<tr>
<td>runin slp</td>
</tr>
<tr>
<td>Mrun syn</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Attributes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>global block search link</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Program sensitive:</th>
</tr>
</thead>
<tbody>
<tr>
<td>No restrictions</td>
</tr>
</tbody>
</table>

### STRING

**$P\_BLOCKNO[INMAXFILESTACK]**

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
</table>
| $P\_BLOCKNO[n] 
Supply the last programmed block number of program level n. |
| Example: |
| $P\_BLOCKNO[0] 
Supply the modal block number of the program on program level 0 = main program name. |
| MD 10284 $MN\_DISPLAY\_FUNCTION\_MASK Bit0 must be = 1. 
Block numbers programmed during DISPLOF cannot be read with $P\_BLOCKNO. |

| NCK version: 58.00.00 |

<table>
<thead>
<tr>
<th>Attributes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not classified</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Program sensitive:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not classified</td>
</tr>
</tbody>
</table>
### $P\_LINENO[INMAXFILESTACK]$

**Description:**

$P\_LINENO[n]$ supplies the last programmed line number of program level $n$.

**Example:**

$P\_LINENO[0]$ supplies the line number of the program on program level $0 = $ main program level.

**Description of field limits:**

- **n:** Defines the program level from which the line number is to be read.

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>unit:</th>
<th>NCK version:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>INT</td>
<td>58.00.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>run-in</th>
<th>main run</th>
<th>runin stp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Attributes:**

- Global
- Block search
- Link

### $AC\_AUTO\_JOG\_STATE$

**Description:**

1: Automatic is selected, $MN\_JOG\_MODE\_MASK$ is set and the mode group is "BAG-Reseted". By actuating the +/- buttons or the handwheel, you can jog in Auto mode.

2: After a JOG movement has been performed, this mode group was switched by the system to JOG. The VDI and OPI still display Automatic mode.

0: Other

**Remark:** This information covers the whole mode group and is available to each mode group channel via $AC\_AUTO\_JOG\_STATE$.

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>NCK version:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>59.00.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>run-in</th>
<th>main run</th>
<th>runin stp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Attributes:**

- Global
- Block search
- Link

Not classified Not classified
### DOUBLE $AC_FIFO[n,m]$

#### Description:

Variable $AC_FIFO[n,m]$ access the n-th first in first out stack. See also $AC_FIFO1 .. $AC_FIFO10.

$MC_NUM_AC_FIFO$ is used to define the range of n values and thus the number of FIFO Stacks $AC_FIFO1 - $AC_FIFO10.

The elements of the stack memory are saved in R variables. The length of all FIFO stacks is configured with $MC_LEN_AC_FIFO$.

$MC_START_AC_FIFO$ is used to specify the number of the start R variable, from which the FIFO elements are stored.

R variables assigned to FIFO areas should not be written elsewhere.

The number of R variables must be set in machine data $MC_MM_NUM_R_PARAM$ such that all FIFO variables can be stored:

$$MC_MM_NUM_R_PARAM = MC_MM_START_FIFO + MC_NUM_AC_FIFO * (MC_LEN_AC_FIFO + 6)$$

The FIFO variable is an array variable.

Indices 0 - 5 have special meanings:

- m = 0: When written with index 0, a new value is stored in the FIFO.
- m = 1: Access to the first element read
- m = 2: Access to the last element read
- m = 3: Total of all FIFO elements if Bit0 in $MC_MM_MODE_FIFO$ is set.
- m = 4: Number of elements available in the FIFO
- m = 5: Current write index relative to the start of the FIFO
- m = 6: Oldest element
- m = 7: Second oldest etc.

#### Description of Field Limits:

The dimension is defined in $MC_NUM_AC_FIFO$.

The dimension is defined in $MC_LEN_AC_FIFO$.

<table>
<thead>
<tr>
<th>Identifier</th>
<th>NCK Version</th>
<th>60.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit</td>
<td>DBL_MIN</td>
<td>DBL_MAX</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>Mrun syn</td>
</tr>
<tr>
<td>read: X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write: X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>attributes</td>
<td>global</td>
<td>block search</td>
</tr>
<tr>
<td></td>
<td>Not classified</td>
<td>Not classified</td>
</tr>
</tbody>
</table>

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SINUMERIK 840D sl/840Di sl/ 840D/ 840Di, List of System Variables (PGA1), 01/2008
1.3 Channel-specific system variables

**$AC_AUXFU_M_VALUE[64]**

**Description:**
The array variable $AC_AUXFU_M_VALUE[n]$ is used to read the value of the M auxiliary function that has been collected last for an auxiliary function group (search run) or output. Auxiliary functions are assigned to groups. The index corresponds to the group number decremented by one. The index 0 determines the value of the M auxiliary function output last for the 1st group. If an auxiliary function has not yet been output for the group specified, the variable returns the value -1. The relevant extension can be determined with the variable $AC_AUXFU_M_EXT[n]$. The variable $AC_AUXFU_M_STATE[n]$ determines the current output status.

**Description of field limits:**
The index corresponds to the auxiliary function group number decremented by one.

**Axis Identifier:**
NCK version: 59.00.00

<table>
<thead>
<tr>
<th>access rights</th>
<th>read</th>
<th>write</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>main run</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>runin stp</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Mrun syn</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>PP</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>SA</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>OPT</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>OEM</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

**Attributes:**
Global block search link

**Not classified**

**$AC_AUXFU_M_EXT[64]**

**Description:**
The array variable $AC_AUXFU_M_EXT[n]$ is used to read the extension of the M auxiliary function that has been collected last for an auxiliary function group (search run) or output. Auxiliary functions are assigned to groups. The index corresponds to the group number decremented by one. The index 0 determines the extension of the M auxiliary function output last for the 1st group. If an auxiliary function has not yet been output for the group specified, the variable returns the value -1. The relevant value of the auxiliary function can be determined with the variable $AC_AUXFU_M_VALUE[n]$. The variable $AC_AUXFU_M_STATE[n]$ determines the current output status.

**Description of field limits:**
The index corresponds to the auxiliary function group number decremented by one.

**Axis Identifier:**
NCK version: 59.00.00

<table>
<thead>
<tr>
<th>access rights</th>
<th>read</th>
<th>write</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>main run</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>runin stp</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Mrun syn</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>PP</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>SA</td>
<td>X</td>
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</tr>
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<td>OPT</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>OEM</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

**Attributes:**
Global block search link

**Not classified**
### Channel-specific system variables

#### $AC_AUXFU_M_STATE[64]

**Description:**
The array variable $AC_AUXFU_M_STATE[n] is used to read the output status of the M auxiliary function that has been collected last for an auxiliary function group (search run) or output. Auxiliary functions are assigned to groups. The index corresponds to the group number decremented by one. The index 0 determines the status of the M auxiliary function output last for the 1st group. If an auxiliary function has not yet been output for the group specified, the variable returns the value 0. If the value is greater than 0, the relevant auxiliary function value can be determined with the variable $AC_AUXFU_M_VALUE[n]. The variable $AC_AUXFU_M_EXT[n] determines the current extension of the auxiliary function.

The variable returns the following values:

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Auxiliary function not available</td>
</tr>
<tr>
<td>1</td>
<td>M-auxiliary function collected via search run</td>
</tr>
<tr>
<td>2</td>
<td>M-auxiliary function output to the PLC</td>
</tr>
<tr>
<td>3</td>
<td>M-auxiliary function output to the PLC, transfer has been acknowledged.</td>
</tr>
<tr>
<td>4</td>
<td>M-auxiliary function managed by the PLC and integrated into the PLC.</td>
</tr>
<tr>
<td>5</td>
<td>M-auxiliary function managed by the PLC, function has been acknowledged.</td>
</tr>
</tbody>
</table>

**Description of field limits:**
The index corresponds to the auxiliary function group number decremented by one.

<table>
<thead>
<tr>
<th>Axis identifier</th>
<th>NCK version: 59.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit:</td>
<td>min.: 0 max.: 5</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
</tr>
<tr>
<td>runin sync</td>
<td>PP SA OPI OEM access rights</td>
</tr>
<tr>
<td>read:</td>
<td>X X X X X X</td>
</tr>
<tr>
<td>write:</td>
<td>global block search link</td>
</tr>
<tr>
<td>attributes:</td>
<td>Not classified Not classified</td>
</tr>
</tbody>
</table>

#### $P_THREAD_PITCH

**Description:**
$P_THREAD_PITCH provides the lead with G33, G34, G35, G331 and G332 programmed under the address I, J or K. Value 0 is supplied in the RESET state or if no lead has been programmed. With G33, G34 and G35 a positive value is always returned. With G331 and G332, the sign results from the spindle rotation direction: positive in clockwise direction (as with M3) or negative in counterclockwise direction (as with M4).

In the following example, $P_THREAD_PITCH provides the value "1.5".

```plaintext
N11 M4 S500
N12 G33 Z10 K1.4
N13 G33 Z12 K1.5
N14 R1=$P_THREAD_PITCH ; R1=1.5
```

<table>
<thead>
<tr>
<th>Axis identifier</th>
<th>NCK version: 60.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit:</td>
<td>THREA D_PITCH min.: DBL_MIN max.: DBL_MAX</td>
</tr>
<tr>
<td>run-in</td>
<td>main run runin sync PP SA OPI OEM access rights</td>
</tr>
<tr>
<td>read:</td>
<td>X X</td>
</tr>
<tr>
<td>write:</td>
<td>global block search link</td>
</tr>
<tr>
<td>attributes:</td>
<td>Not classified Not classified</td>
</tr>
</tbody>
</table>
DOUBLE $P\_THREAD\_PITCH\_INC
description:
$P\_THREAD\_PITCH\_INC$ supplies the value programmed under the address F for the lead change (G34/G35). Value 0 is supplied in the RESET state or if no lead change has been programmed. The returned value is positive in the case of G34 or negative in the case of G35.

Example:
M3 S400
G35 F2 Z10 K5
R1=$P\_THREAD\_PITCH\_INC ;R1= -2

DOUBLE $AC\_THREAD\_PITCH
description:
$AC\_THREAD\_PITCH$ provides the lead for G33, G34, G35, G331 and G332 programmed under address I, J or K. In the RESET state or if no lead has been programmed, the value 0 is given. With G33, G34 and G35, a positive value is always returned. With G331 and G332, the sign from the spindle rotating direction is as follows: positive for clockwise rotation (as with M3) or negative for counterclockwise rotation (as with M4).

In the following example, $AC\_THREAD\_PITCH$ provides the value "1.5":
N11 M4 S500
N12 G33 Z10 K1.5
N13 G33 Z12 K1.5
N14 R1=$AC\_THREAD\_PITCH ;R1= 1.5
## 1.3 Channel-specific system variables

<table>
<thead>
<tr>
<th>DOUBLE</th>
<th>$AC_THREAD_PITCH_INC</th>
<th>description:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$AC_THREAD_PITCH_INC provides the value programmed under the address F for lead change (G34/G35). In the RESET state or if a change in lead has not been programmed, the value 0 is supplied. The returned value is positive for G34 and negative for G35.</td>
<td></td>
</tr>
<tr>
<td>axis identifier:</td>
<td>NCK version: 60.00.00</td>
<td></td>
</tr>
<tr>
<td>unit:</td>
<td>min.: DBL_MIN</td>
<td>max.: DBL_MAX</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin stp</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DOUBLE</th>
<th>$AC_THREAD_PITCH_ACT</th>
<th>description:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$AC_THREAD_PITCH_ACT provides the current value for the lead. This value is continuously updated in blocks with G34 or G35 according to the value programmed under F. Only with thread blocks (G33, G34, G35, G331 and G332) a value unequal zero is supplied.</td>
<td></td>
</tr>
<tr>
<td>axis identifier:</td>
<td>NCK version: 60.00.00</td>
<td></td>
</tr>
<tr>
<td>unit:</td>
<td>min.: DBL_MIN</td>
<td>max.: DBL_MAX</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin stp</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
</tr>
</tbody>
</table>

Example:

M3 S400
G34 F4 Z10 K2
R1=$P\_THREAD\_PITCH\_INC ; R1= 4
### 1.3 Channel-specific system variables

#### DOUBLE \$P_TOOLROT\[3\]

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Programmed tool rotation vector</td>
</tr>
<tr>
<td>Normalized vector with length 1 and the components</td>
</tr>
<tr>
<td>(n = 1, 2, 3) in the range (-1, ..., 1).</td>
</tr>
<tr>
<td>1: x-component</td>
</tr>
<tr>
<td>2: y-component</td>
</tr>
<tr>
<td>3: z-component</td>
</tr>
<tr>
<td>If no tool is active, the following unit vector is returned, depending on the active plane:</td>
</tr>
<tr>
<td>G17: (0, 1, 0)</td>
</tr>
<tr>
<td>G18: (1, 0, 0)</td>
</tr>
<tr>
<td>G19: (0, 0, 1)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description of field limits:</th>
</tr>
</thead>
<tbody>
<tr>
<td>(n): Components 1 - 3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Axis identifier:</th>
<th>NCK version:</th>
<th>60.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit:</td>
<td>min.:</td>
<td>max.:</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin stp</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
</tr>
</tbody>
</table>

| Not classified | No restrictions |

#### DOUBLE \$AC_TOOLR_ACT\[3\]

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active command rotation vector</td>
</tr>
<tr>
<td>Normalized vector with length 1 and the components</td>
</tr>
<tr>
<td>(n = 1, 2, 3) in the range (-1, ..., 1).</td>
</tr>
<tr>
<td>1: x-component</td>
</tr>
<tr>
<td>2: y-component</td>
</tr>
<tr>
<td>3: z-component</td>
</tr>
<tr>
<td>If no tool is active, the following unit vector is returned, depending on the active plane:</td>
</tr>
<tr>
<td>G17: (0, 1, 0)</td>
</tr>
<tr>
<td>G18: (1, 0, 0)</td>
</tr>
<tr>
<td>G19: (0, 0, 1)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description of field limits:</th>
</tr>
</thead>
<tbody>
<tr>
<td>(n): Components 1 - 3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Axis identifier:</th>
<th>NCK version:</th>
<th>60.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit:</td>
<td>min.:</td>
<td>max.:</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin stp</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
</tr>
</tbody>
</table>

| Not classified | No restrictions |
### $\$AC\_TOOLR\_END[n]$  
End rotation vector of active block  
Normalized vector with length 1 and the components  
\((n = 1, 2, 3)\) in the range \(-1, ..., 1\).  
1: x-component  
2: y-component  
3: z-component  
If no tool is active, the following unit vector is returned, depending on the active plane:  
G17: \((0, 1, 0)\)  
G18: \((1, 0, 0)\)  
G19: \((0, 0, 1)\)  

<table>
<thead>
<tr>
<th>description of field limits:</th>
<th>n: Components 1 - 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>axis identifier: NCK version: unit: - min.: -1.0 max.: 1.0 run-in main run runin stp Mrun syn PP SA OPI OEM access rights read:</td>
<td>60.00.00</td>
</tr>
<tr>
<td>write:</td>
<td></td>
</tr>
<tr>
<td>attributes: global block search link</td>
<td>Not classified No restrictions</td>
</tr>
</tbody>
</table>

### $\$AC\_TOOLR\_DIFF$  
Remaining angle of tool rotation in active block in degree in the range 0 ... 180 degree.  

<table>
<thead>
<tr>
<th>description of field limits:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>axis identifier: NCK version: unit: deg. min.: 0.0 max.: 180.0 run-in main run runin stp Mrun syn PP SA OPI OEM access rights read:</td>
<td>60.00.00</td>
</tr>
<tr>
<td>write:</td>
<td></td>
</tr>
<tr>
<td>attributes: global block search link</td>
<td>Not classified No restrictions</td>
</tr>
</tbody>
</table>
### 1.3 Channel-specific system variables

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>$\text{VC_TOOLR}[n]$</strong></td>
<td>Actual tool rotation&lt;br&gt;Normalized vector with length 1 and the components&lt;br&gt;((n = 1, 2, 3)) in the range -1, …, 1.&lt;br&gt;1: x-component&lt;br&gt;2: y-component&lt;br&gt;3: z-component&lt;br&gt;If no tool is active, the following unit vector is returned, depending on the active plane:&lt;br&gt;G17: (0, 1, 0)&lt;br&gt;G18: (1, 0, 0)&lt;br&gt;G19: (0, 0, 1)</td>
</tr>
<tr>
<td><strong>$\text{VC_TOOLR_DIFF}$</strong></td>
<td>Angle between command and actual tool rotation in degree in the range 0 … 180 degree.</td>
</tr>
</tbody>
</table>

#### $\text{VC\_TOOLR}[n]$ Properties

- **Type:** DOUBLE
- **Description:** $\text{VC\_TOOLR}[n]$
- **Normalized vector with length 1 and the components**
- **(n = 1, 2, 3) in the range -1, …, 1.**
- **1:** x-component
- **2:** y-component
- **3:** z-component
- **If no tool is active, the following unit vector is returned, depending on the active plane:**
  - G17: (0, 1, 0)
  - G18: (1, 0, 0)
  - G19: (0, 0, 1)

#### $\text{VC\_TOOLR\_DIFF}$ Properties

- **Type:** DOUBLE
- **Description:** $\text{VC\_TOOLR\_DIFF}$
- **Angle between command and actual tool rotation in degree in the range 0 … 180 degree.**

---

<table>
<thead>
<tr>
<th><strong>Categories</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Axis identifier</td>
<td>NCK version: 60.00.00</td>
</tr>
<tr>
<td>Unit</td>
<td>-</td>
</tr>
<tr>
<td>Min.</td>
<td>-1.0</td>
</tr>
<tr>
<td>Max.</td>
<td>1.0</td>
</tr>
<tr>
<td>Read</td>
<td>X X X X X</td>
</tr>
<tr>
<td>Write</td>
<td>Not classified</td>
</tr>
<tr>
<td>Attributes</td>
<td>Global block search link</td>
</tr>
</tbody>
</table>

---

<table>
<thead>
<tr>
<th><strong>Categories</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Axis identifier</td>
<td>NCK version: 60.00.00</td>
</tr>
<tr>
<td>Unit</td>
<td>Deg.</td>
</tr>
<tr>
<td>Min.</td>
<td>0.0</td>
</tr>
<tr>
<td>Max.</td>
<td>180.0</td>
</tr>
<tr>
<td>Read</td>
<td>X X X X X</td>
</tr>
<tr>
<td>Write</td>
<td>Not classified</td>
</tr>
<tr>
<td>Attributes</td>
<td>Global block search link</td>
</tr>
</tbody>
</table>
### INT $VC_TOOLR_STAT

**Description:**
Status of calculation of actual tool rotation:
- 0: MCS -> BCS Transformation in one ipo cycle
- -1: MCS -> BCS transformation not in one ipo cycle possible

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>NCK version: 60.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>NCK version: 60.00.00</td>
</tr>
<tr>
<td>main run</td>
<td>NCK version: 60.00.00</td>
</tr>
<tr>
<td>runin slip</td>
<td>NCK version: 60.00.00</td>
</tr>
<tr>
<td>mrun syn</td>
<td>NCK version: 60.00.00</td>
</tr>
<tr>
<td>PP</td>
<td>NCK version: 60.00.00</td>
</tr>
<tr>
<td>SA</td>
<td>NCK version: 60.00.00</td>
</tr>
<tr>
<td>OPI</td>
<td>NCK version: 60.00.00</td>
</tr>
<tr>
<td>OEM</td>
<td>NCK version: 60.00.00</td>
</tr>
<tr>
<td>access rights</td>
<td>NCK version: 60.00.00</td>
</tr>
</tbody>
</table>

**Attributes:**
- read: X X X
- write: X X X X
- global
- block
- search
- link
- Not classified
- No restrictions

### BOOL $P_SIMUL

**Description:**
Value==TRUE

The part program is executed in the control under the Simulation search run mode.

The simulation search run is a search run (with calculation) which is aborted with an internal M30 once the end of the program has been reached.

The control is internally in search run mode, the variables $P_SEARCH, $P_SEARCH1, $P_SEARCH2 and $P_SEARCHL are also correctly supplied.

Parts program adjustments can be made through variables $P_SEARCH* or $P_SIMUL. $P_SIMUL is designed only for adjustments restricted to the simulation search run.

Value==FALSE No simulation search run is active.

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>NCK version: 61.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>NCK version: 61.00.00</td>
</tr>
<tr>
<td>main run</td>
<td>NCK version: 61.00.00</td>
</tr>
<tr>
<td>runin slip</td>
<td>NCK version: 61.00.00</td>
</tr>
<tr>
<td>mrun syn</td>
<td>NCK version: 61.00.00</td>
</tr>
<tr>
<td>PP</td>
<td>NCK version: 61.00.00</td>
</tr>
<tr>
<td>SA</td>
<td>NCK version: 61.00.00</td>
</tr>
<tr>
<td>OPI</td>
<td>NCK version: 61.00.00</td>
</tr>
<tr>
<td>OEM</td>
<td>NCK version: 61.00.00</td>
</tr>
<tr>
<td>access rights</td>
<td>NCK version: 61.00.00</td>
</tr>
</tbody>
</table>

**Attributes:**
- read: X
- write: X
- global
- block
- search
- link
- Current value
- Not classified

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SINUMERIK 840D sl/840Di sl/ 840D/ 840Di, List of System Variables (PGA1), 01/2008
## 1.3 Channel-specific system variables

### $P\_SUB\_STAT$

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A replacement of the tool programming has been configured (address D, DL, T or M function through which the tool change cycle is called up). $P_SUB_STAT$ now permits polling to see if the substitution process is active and if the process is executed at the start or the end of the block.</td>
</tr>
</tbody>
</table>

Value 0: Substitution subprogram not active  
Value 1: Substitution subprogram active, call-up at start of block  
Value 2: Substitution subprogram active, call-up at end of block

The system variable is influenced by machine data $MN\_T\_NO\_FCT\_CYCLE\_MODE$ bit 1 and 2.

### $A\_USEDND[SLMDMAXMAGLOCA\_TIONSWITHDISTANCE]$

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
</table>
| $A\_USEDND[$toolHolder]  
The number of cutting edges used in tool holder s, counted since the last setpiece command, including the currently active cutting edge.  
toolHolder=1,...,maximum tool holder number  
toolHolder=0 = The master tool holder is selected  
Result = >0 = Number of cutting edges that have been used.  
Result =  0 = There have been no cuts since the last setpiece command.  
Result = -1 = Tool Management Tool Monitoring is not active.  
Result = -2 = toolHolder is not the value of a defined tool holder. |

description of field limits:  
toolHolder: Spindle number / Tool holder number

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SINUMERIK 840D sl/840Di sl/ 840D/ 840Di, List of System Variables (PGA1), 01/2008
### $A\_USEDT[SLMDMAXMA\_LOC\_ONSWIT\_DISTANCE,1500]$  
**Description:**  
T-Number for the i-th cutting edge used with tool holder s since the last setpiece command, including the currently active cutting edge.  
- **toolHolder=1,...,maximum tool holder number**  
- toolHolder=0 = The master tool holder is selected  
- Result = >0 = T-Number (can occur several times) (if different D-corrections of the tool were used).  
- Result = 0 = There have been no cuts since the last setpiece command.  
- Result = -1 = Tool Management Tool Monitoring is not active.  
- Result = -2 = toolHolder is not the value of a defined tool holder.  

**Field limits:**  
- **toolHolder:** Spindle number / Tool holder number  
- **usedCuttingEdgeIndex:** index  

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>NCK version: 62.00.00</th>
<th>unit: -</th>
<th>min.: 0</th>
<th>max.: INT_MAX</th>
<th>read:</th>
<th>write:</th>
<th>attributes:</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin slp</td>
<td>Mrun syn</td>
<td>PP</td>
<td>SA</td>
<td>OPI</td>
<td>OEM</td>
<td>access rights</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>attributes:</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

### $A\_USESDD[SLMDMAXMA\_LOC\_ONSWIT\_DISTANCE,1500]$  
**Description:**  
D-Number for the i-th cutting edge used with tool holder s since the last setpiece command, including the currently active cutting edge.  
- **toolHolder=1,...,maximum tool holder number**  
- toolHolder=0 = The master tool holder is selected  
- Result = >0 = D-Number (can occur several times) (if different D-corrections of the tool were used).  
- Result = 0 = There have been no cuts since the last setpiece command.  
- Result = -1 = Tool Management Tool Monitoring is not active.  
- Result = -2 = toolHolder is not the value of a defined tool holder.  

**Field limits:**  
- **toolHolder:** Spindle number / Tool holder number  
- **usedCuttingEdgeIndex:** index  

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>NCK version: 62.00.00</th>
<th>unit: -</th>
<th>min.: 0</th>
<th>max.: INT_MAX</th>
<th>read:</th>
<th>write:</th>
<th>attributes:</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin slp</td>
<td>Mrun syn</td>
<td>PP</td>
<td>SA</td>
<td>OPI</td>
<td>OEM</td>
<td>access rights</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>attributes:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1.3 Channel-specific system variables

**$AC_AUXFU_M_TICK[64]**

**Description:**
Field variable $AC_AUXFU_M_TICK[n] is used to read the time stamp of the M auxiliary function collected (search run) or output last for an auxiliary function group. Auxiliary functions are assigned to groups. The index corresponds to a group number decremented by one. Index 0 therefore determines the value of the M auxiliary function of the 1st group, which was output last. If no auxiliary function has been output for the specific group, the variable indicates value -1. The respective value can be determined using variable $AC_AUXFU_M_VALUE[n] and the respective extension using variable $AC_AUXFU_M_EXT[n]. Variable $AC_AUXFU_M_STATE[n] determines the current output state.

**Description of field limits:**
The index corresponds to the auxiliary function group number decremented by one.

<table>
<thead>
<tr>
<th>axis</th>
<th>identifier:</th>
<th>NCK version:</th>
<th>63.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit:</td>
<td>run-in min.:</td>
<td>INT_MIN</td>
<td></td>
</tr>
<tr>
<td></td>
<td>max.:</td>
<td>INT_MAX</td>
<td></td>
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<td>read:</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
<td>link</td>
</tr>
</tbody>
</table>

**$AC_CONE_ANGLE**

**Description:**
Currently active cone angle for cone turning. The cone angle is set by default via the setting data $SC_CONE_ANGLE and is active in JOG mode only.

<table>
<thead>
<tr>
<th>axis</th>
<th>identifier:</th>
<th>NCK version:</th>
<th>62.03.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit:</td>
<td>deg. min.:</td>
<td>-90</td>
<td>90</td>
</tr>
<tr>
<td>run-in</td>
<td>main run runin stp Mrun syn</td>
<td>PP</td>
<td>SA</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
<td>link</td>
</tr>
</tbody>
</table>

Not classified Not classified
### BOOL $P\_TECCYCLE

**description:**
To control the context-specific interpretation of program parts in technology cycles, preprocessing variable $P\_TECCYCLE is available. Using this variable, programs can be subdivided into synchronized action program parts and preprocessing program parts.

**Example:**

```plaintext
if ($P\_TECCYCLE == TRUE)
  ; Program sequence for a technology cycle in synchronized action
else
  ; Program sequence for parts program cycle
endif
```

**axis identifier:**

<table>
<thead>
<tr>
<th>run-in</th>
<th>main run</th>
<th>runin slip</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**write:**

- read: X
- write: X

**attributes:**
- global
- block search
- sink
- Not classified

### BOOL $AC\_WORKAREA\_CS\_PLUS_ENA

**description:**

TRUE: The limitation in the positive direction for the stated axis of the active coordinate system-specific working area limitation is valid. (See $AC\_WORKAREA\_CS\_LIMIT\_PLUS[ ax])

**description of field limits:**

to be defined

**axis identifier:**

<table>
<thead>
<tr>
<th>axis identifier: GEOAXCHANAXMACHAX</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
</tr>
<tr>
<td>X</td>
</tr>
</tbody>
</table>

**write:**

- read: X
- write: X

**attributes:**
- global
- block search
- sink
- Not classified

**Not classified**

**No restrictions**
### BOOL

**$AC_WORKAREA_CS_MINUS_ENABLe[n]**

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>MACHAX</th>
<th>NCK version:</th>
<th>65.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit:</td>
<td>-</td>
<td>min.:</td>
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<td>max.: TRUE</td>
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<td>main run</td>
<td>runin slip</td>
<td>Mrun syn</td>
<td>PP</td>
<td>SA</td>
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<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>attributes:</td>
<td>global</td>
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<td>link</td>
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<tr>
<td></td>
<td>Not classified</td>
<td>No restrictions</td>
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</tbody>
</table>

**description:**
TRUE: The limitation in the negative direction for the stated axis of the active coordinate system-specific working area limitation is valid. (See $AC_WORKAREA_CS_LIMIT_MINUS[ ax]$)

description of field limits:
to be defined

### DOUBLE

**$AC_WORKAREA_CS_LIMIT_PLUS[n]**

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>MACHAX</th>
<th>NCK version:</th>
<th>65.00.00</th>
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<tr>
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<td>Linear / angular position</td>
<td>min.:</td>
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<td>run-in</td>
<td>main run</td>
<td>runin slip</td>
<td>Mrun syn</td>
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<td>No restrictions</td>
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</tbody>
</table>

**description:**
The limitation in the positive direction for the stated axis of the stated group of the coordinate system-specific working area limitation. This value is only evaluated if $AC_WORKAREA_CS_PLUS_ENABLE = TRUE.$

description of field limits:
to be defined
### $AC_WORKAREA_CS_LIMIT_MINUS

**Type:** DOUBLE

**Description:**
The limitation in the negative direction for the stated axis of the stated group of the coordinate system-specific working area limitation. This value is only evaluated if $AC_WORKAREA_CS_MINUS_ENABLE = TRUE.

**Description of Field Limits:**
To be defined

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>Unit</th>
<th>Min.</th>
<th>Max.</th>
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<td>Linear / angular position</td>
<td>$DBL_MIN$</td>
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<tr>
<td>MACHAX</td>
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</table>

**Access Rights:**
- Read: X X X X X X
- Write: 7

**Attributes:**
- Global
- Block search
- Link

**Classification:**
- Not classified
- No restrictions

---

### $AC_WORKAREA_CS_COORD_SY

**Type:** INT

**Description:**
Coordinate system in which the active, coordinate-specific working area limitation applies.

The following values apply:
- Working area limitation applies in the WCS
- Working area limitation applies in the SZS

**Axis Identifier:**
- GEOAX
- CHANAX
- MACHAX

**Unit:** -

**Min.:** 0

**Max.:** $INT\_MAX$

**Access Rights:**
- Read: X X X X X
- Write: 7

**Attributes:**
- Global
- Block search
- Link

**Classification:**
- Not classified
- No restrictions
### INT

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<tr>
<th><strong>$AC_WORKAREA_CS_GROUP</strong></th>
<th>description:</th>
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</thead>
<tbody>
<tr>
<td>Number of the active group of the coordinate system-specific working area limitation. The value is determined in the NC program by the G code WALCS0-WALCS10.</td>
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<table>
<thead>
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### FRAME

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<th>description:</th>
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<tr>
<td>Variable $P_ISO1FRAME is used to program the active system frame for ISO G51.1 mirroring. On a Reset, the activation of the system frame depends on the following machine data: Bit0 in $MC_RESET_MODE_MASK Bit7 in $MC_CHSFRAME_RESET_MASK</td>
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<th>MACHAX</th>
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<td>max.: DBL_MAX</td>
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<tr>
<td>run-in main run runin stp Mrun syn PP SA OPT OEM access rights</td>
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<td>attributes:</td>
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### FRAME

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<th><strong>$P_ISO2FRAME</strong></th>
<th>description:</th>
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<tbody>
<tr>
<td>The variable $P_ISO2FRAME is used to program the active system frame for ISO G68 2DROT. On a Reset, the activation of the system frame depends on the following machine data: Bit0 in $MC_RESET_MODE_MASK Bit8 in $MC_CHSFRAME_RESET_MASK</td>
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<table>
<thead>
<tr>
<th>axis identifier:</th>
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<tr>
<td>unit:</td>
<td>-</td>
<td>min.: DBL_MIN</td>
<td>max.: DBL_MAX</td>
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</tr>
<tr>
<td>run-in main run runin stp Mrun syn PP SA OPT OEM access rights</td>
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<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
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<tr>
<td>write:</td>
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<tr>
<td>attributes:</td>
<td>global block search link</td>
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SINUMERIK 840D sl/840Di sl/ 840D/ 840Di, List of System Variables (PGA1), 01/2008
### Frame: $P_ISO3FRAME

**Description:**
The variable $P_ISO3FRAME is used to program the active system frame for ISO G68 3DROT.
On a Reset, the activation of the system frame depends on the following machine data:
- Bit0 in $MC_RESET_MODE_MASK
- Bit9 in $MC_CHSFRAME_RESET_MASK

**Axis Identification:**
- GEOAX
- CHANAX
- MACHAX
- SPINDLE

**NCK Version:** 66.00.00

**Unit:** -
**Min.:** DBL_MIN
**Max.:** DBL_MAX

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<th>Run</th>
<th>Stop</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>Access Rights</th>
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**Attributes:**
- Global
- Block
- Search
- Link

Not classified
No restrictions

### Frame: $P_ISO4FRAME

**Description:**
The variable $P_ISO4FRAME is used to program the active system frame for ISO G61 Scale.
On a Reset, the activation of the system frame depends on the following machine data:
- Bit0 in $MC_RESET_MODE_MASK
- Bit10 in $MC_CHSFRAME_RESET_MASK

**Axis Identification:**
- GEOAX
- CHANAX
- MACHAX
- SPINDLE

**NCK Version:** 66.00.00

**Unit:** -
**Min.:** DBL_MIN
**Max.:** DBL_MAX

<table>
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<tr>
<th>Read</th>
<th>Main</th>
<th>Run</th>
<th>Stop</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>Access Rights</th>
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</tbody>
</table>

**Attributes:**
- Global
- Block
- Search
- Link

Not classified
No restrictions
### FRAME: $P_{\text{ACSFRAME}}$

**description:**
The variable $P_{\text{ACSFRAME}}$ determines the active chained total frame between BCS and SZS.

The following applies to $\text{MC\_FRAME\_ACS\_SET} = 0$:

\[
P_{\text{ACSFRAME}} = P_{\text{PARTFRAME}} : P_{\text{SETFRAME}} : P_{\text{EXTRAM}} : P_{\text{ISO1FRAME}} : P_{\text{ISO2FRAME}} : P_{\text{ISO3FRAME}} : P_{\text{ACTBFRAM}} : P_{\text{IFRAME}} : P_{\text{TOOLFRAME}} : P_{\text{WPFRAME}}
\]

The following applies to $\text{MC\_FRAME\_ACS\_SET} = 1$:

\[
P_{\text{ACSFRAME}} = P_{\text{PARTFRAME}} : P_{\text{SETFRAME}} : P_{\text{EXTRAM}} : P_{\text{ISO1FRAME}} : P_{\text{ISO2FRAME}} : P_{\text{ISO3FRAME}} : P_{\text{ACTBFRAM}} : P_{\text{IFRAME}} : P_{\text{TOOLFRAME}} : P_{\text{WPFRAME}} : P_{\text{TRAFRAME}} : P_{\text{PFRAME}} : P_{\text{ISO4FRAME}}
\]

**axis identifier:** GEOAX CHANAX MACHAX SPINDLE

**unit:** - min.: DBL_MIN max.: DBL_MAX

**run-in main run runin stp Mrun syn PP SA OPI OEM access rights**

**read:** X X X

**write:**

**attributes:**
- global
- block search
- link

**Not classified No restrictions**

### BOOL: $P_{\text{CUT_INV}}$

**description:**

$P_{\text{CUT_INV}}$

This system variable is used to indicate whether or not the direction of spindle rotation has to be inverted for machining with the currently active tool.

The variable has the value TRUE if the four following conditions are fulfilled:

1. A turning tool is active (tool types 500 to 599).
2. The cutting edge influencing has been activated with the language command CUTMOD = 1 or CUTMOD = 2.
3. A tool carrier with orientation capability is active.
4. The tool carrier with orientation capability rotates the tool so that the resulting normal of the tool cutting edge to the initial position is rotated more than 90 degrees (typically 180 degrees).

The content of the variable is FALSE if at least one of the four conditions has not been fulfilled.

**axis identifier:** GEOAX CHANAX MACHAX SPINDLE

**unit:** - min.: FALSE max.: TRUE

**run-in main run runin stp Mrun syn PP SA OPI OEM access rights**

**read:** X X X

**write:**

**attributes:**
- global
- block search
- link

**Not classified No restrictions**
### BOOL $\text{AC\_CUT\_INV}$

**description:**

$\text{AC\_CUT\_INV}$

This system variable is used to indicate whether or not the direction of spindle rotation has to be inverted for machining with the currently active tool.

The variable has the value TRUE if the four following conditions are fulfilled:

1. A turning tool is active (tool types 500 to 599).
2. The cutting edge influencing has been activated with the language command CUTMOD = 1 or CUTMOD = 2.
3. A tool carrier with orientation capability is active.
4. The tool carrier with orientation capability rotates the tool so that the resulting normal of the tool cutting edge to the initial position is rotated more than 90 degrees (typically 180 degrees).

The content of the variable is FALSE if at least one of the four conditions has not been fulfilled.

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>NCK version: 66.00.00</th>
</tr>
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<tbody>
<tr>
<td><strong>unit:</strong> -</td>
<td><strong>min.:</strong> FALSE</td>
</tr>
<tr>
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<td></td>
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<tr>
<td><strong>run-in</strong></td>
<td><strong>main run</strong></td>
</tr>
<tr>
<td><strong>runin ssp</strong></td>
<td><strong>Mrun syn</strong></td>
</tr>
<tr>
<td><strong>PP</strong></td>
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<td><strong>read:</strong> X</td>
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<td><strong>attributes:</strong></td>
<td>global block search</td>
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<td></td>
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</table>

### INT $\text{P\_CUTMOD}$

**description:**

$\text{P\_CUTMOD}$

Reads the current valid value that was last programmed with the language command CUTMOD (number of the tool carrier for which the cutting edge data modification is to be activated).

If the last programmed value was CUTMOD = -2 (activation with the currently active tool carrier with orientation capability), $\text{P\_CUTMOD}$ does not return the value -2 but the number of the active tool carrier with orientation capability at the time of programming.

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>NCK version: 66.00.00</th>
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<td><strong>PP</strong></td>
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<td><strong>OPI</strong></td>
<td><strong>OEM</strong></td>
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<tr>
<td><strong>access rights</strong></td>
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<td><strong>read:</strong> X</td>
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Not classified No restrictions
### 1.3 Channel-specific system variables

#### $\$AC\_CUTMOD$

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<tbody>
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<td>axis identifier:</td>
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<td>NCK version: 66.00.00</td>
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</tr>
</tbody>
</table>
### BOOL \$P\_SUB\_SPOS

**description:**
Returns an NC language substitution TRUE (1) configured with $MA\_AXIS\_LANG\_SUB\_MASK$ bit1 = 1 in the substitution subprogram if the substitution was activated by the SPOS command.

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>NCK version: 66.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in main run runin stp Mrun syn PP SA OPT OEM access rights</td>
<td>read: X write: X</td>
</tr>
<tr>
<td>attributes: global block search link</td>
<td></td>
</tr>
<tr>
<td>Program sensitive No restrictions</td>
<td></td>
</tr>
</tbody>
</table>

### BOOL \$P\_SUB\_SPOSA

**description:**
Returns an NC language substitution TRUE (1) configured with $MA\_AXIS\_LANG\_SUB\_MASK$ bit1 = 1 in the substitution subprogram if the substitution was activated by the SPOSA command.

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>NCK version: 66.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in main run runin stp Mrun syn PP SA OPT OEM access rights</td>
<td>read: X write: X</td>
</tr>
<tr>
<td>attributes: global block search link</td>
<td></td>
</tr>
<tr>
<td>Program sensitive No restrictions</td>
<td></td>
</tr>
</tbody>
</table>

### BOOL \$P\_SUB\_M19

**description:**
Returns an NC language substitution TRUE (1) configured with $MA\_AXIS\_LANG\_SUB\_MASK$ bit1 = 1 in the substitution subprogram if the substitution was activated by M19.

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>NCK version: 66.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in main run runin stp Mrun syn PP SA OPT OEM access rights</td>
<td>read: X write: X</td>
</tr>
<tr>
<td>attributes: global block search link</td>
<td></td>
</tr>
<tr>
<td>Program sensitive No restrictions</td>
<td></td>
</tr>
</tbody>
</table>
### 1.3 Channel-specific system variables

#### DOUBLE $P\_SUB\_SPOSIT

<table>
<thead>
<tr>
<th>Description:</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Returns the programmed position of an NC language substitution configured with $MA_AXIS_LANG_SUB_MASK$ bit1 = 1 in the substitution subprogram. If the variable is called outside this substitution process, the program execution is canceled with alarm 14055.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Axis identifier:</th>
<th>NCK version:</th>
<th>66.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit:</td>
<td>-</td>
<td>DBL_MIN</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin stp</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Attributes:</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>global</td>
<td>block search</td>
<td>link</td>
</tr>
<tr>
<td>Program sensitive</td>
<td>No restrictions</td>
<td></td>
</tr>
</tbody>
</table>

#### INT $P\_SUB\_SPOSMODE

<table>
<thead>
<tr>
<th>Description:</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Returns the position approach mode for the spindle position returned by $P_SUB_SPOSIT$ of a language substitution configured by $MA_AXIS_LANG_SUB_MASK$ bit1 = 1 in the substitution subprogram.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0: DC</td>
<td>1: AC</td>
<td>2: IC</td>
</tr>
<tr>
<td>3: DC</td>
<td>4: ACP</td>
<td>5: ACN</td>
</tr>
<tr>
<td>If the variable is called outside this substitution process, the program execution is canceled with alarm 14055.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Axis identifier:</th>
<th>NCK version:</th>
<th>66.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit:</td>
<td>-</td>
<td>0</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin stp</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Attributes:</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>global</td>
<td>block search</td>
<td>link</td>
</tr>
<tr>
<td>Program sensitive</td>
<td>No restrictions</td>
<td></td>
</tr>
</tbody>
</table>
### 1.3 Channel-specific system variables

#### INT

**$AC_SAFE_SYNA_MEM**

**Description:**
The variable $AC_SAFE_SYNA_MEM determines the number of free synchronized action elements for Safety Integrated. The maximum number of elements is configured by $MC_MM_NUM_SAFE_SYNC_ELEMENTS. The value is read from the part program without a preprocessing stop.

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>NCK version: 67.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit:</td>
<td>INT_MAX</td>
</tr>
<tr>
<td>run-in main run runin slip Mrun syn PP SA OPT OEM access</td>
<td></td>
</tr>
<tr>
<td>read:</td>
<td>X X X X X X</td>
</tr>
<tr>
<td>write:</td>
<td>Not classified</td>
</tr>
</tbody>
</table>

#### DOUBLE

**$AC_ACT_PROG_NET_TIME**

**Description:**
The current net runtime of the current program in seconds, that means the time in which the program was stopped, is deducted. actProgNetTime is automatically reset to zero on part program start in automatic mode, channel status RESET. actProgNetTime can be further manipulated with $AC_PROG_NET_TIME_TRIGGER.

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>NCK version: 67.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit:</td>
<td>DBL_MAX</td>
</tr>
<tr>
<td>run-in main run runin slip Mrun syn PP SA OPT OEM access</td>
<td></td>
</tr>
<tr>
<td>read:</td>
<td>X X X X X X</td>
</tr>
<tr>
<td>write:</td>
<td>Not classified</td>
</tr>
</tbody>
</table>

#### DOUBLE

**$AC_OLD_PROG_NET_TIME**

**Description:**
oldProgNetTime is the net runtime of the just correctly ended program in seconds, that is the program was not canceled with RESET, but terminated normally with M30. If a new program is started, oldProgNetTime remains unaffected until M30 is reached again. The implicit procedure of copying actProgNetTime to oldProgNetTime only takes place if progNetTimeTrigger is not written.

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>NCK version: 67.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit:</td>
<td>DBL_MAX</td>
</tr>
<tr>
<td>run-in main run runin slip Mrun syn PP SA OPT OEM access</td>
<td></td>
</tr>
<tr>
<td>read:</td>
<td>X X X X X X</td>
</tr>
<tr>
<td>write:</td>
<td>Not classified</td>
</tr>
</tbody>
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SINUMERIK 840D sl/840Di sl/ 840D/ 840Di, List of System Variables (PGA1), 01/2008
### 1.3 Channel-specific system variables

<table>
<thead>
<tr>
<th>INT $AC_PROG_NET_TIME_TRIGGER</th>
<th>description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serves for the selective measurement of program sections, that is the time measurement can be switched on and off again by the program by writing progNetTimeTrigger.</td>
<td></td>
</tr>
<tr>
<td>1Starts the measurement and sets actProgNetTime to zero</td>
<td></td>
</tr>
<tr>
<td>2Terminates the measurement and copies actProgNetTime -&gt; oldProgNetTime</td>
<td></td>
</tr>
</tbody>
</table>

Certain values of ProgNetTimeTrigger are given a special function in order to fully exploit all trigger options:

<table>
<thead>
<tr>
<th>Value</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Neutral status.</td>
</tr>
<tr>
<td>1</td>
<td>Terminate</td>
</tr>
<tr>
<td>2</td>
<td>Start</td>
</tr>
<tr>
<td>3</td>
<td>Stop</td>
</tr>
<tr>
<td>4</td>
<td>Resume</td>
</tr>
</tbody>
</table>

Resumption of the measurement, that is a previously stopped measurement is resumed. actProgNetTime runs on. oldProgNetTime remains unchanged.

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>NCK version:</th>
</tr>
</thead>
<tbody>
<tr>
<td>s</td>
<td>67.00.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>unit:</th>
<th>min.:</th>
<th>max.:</th>
</tr>
</thead>
<tbody>
<tr>
<td>s</td>
<td>0</td>
<td>INT_MAX</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>run-in</th>
<th>main run</th>
<th>runin stp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
<td>X</td>
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<td>X</td>
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<td>X</td>
<td>X</td>
<td>7</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>attributes:</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>global</td>
<td></td>
</tr>
<tr>
<td>block search</td>
<td></td>
</tr>
<tr>
<td>link</td>
<td></td>
</tr>
<tr>
<td>Program sensitive</td>
<td></td>
</tr>
<tr>
<td>No restrictions</td>
<td></td>
</tr>
</tbody>
</table>
### $AC_OLD_PROG_NET_TIMECOUNT

**Description:**
Is zero in the power ON status. oldProgNetTimeCount is always increased when the NCK has newly written oldProgNetTime. This enables the user to ensure that oldProgNetTime has been written, that is, if the user cancels the current program with reset, oldProgNetTime and oldProgNetTimeCount remain unchanged.

**Note:** Two programs running consecutively can have identical runtimes and be correctly terminated. The user can then only detect this by the changed oldProgNetTimeCount.

<table>
<thead>
<tr>
<th>Axis Identifier:</th>
<th>NCK Version:</th>
<th>67.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit:</td>
<td>s</td>
<td>0 - INT_MAX</td>
</tr>
<tr>
<td>Run-in:</td>
<td>Main Run:</td>
<td>Runin Stp:</td>
</tr>
<tr>
<td>PP</td>
<td>SA</td>
<td>OPI</td>
</tr>
<tr>
<td>Access Rights:</td>
<td>Read:</td>
<td>Write:</td>
</tr>
<tr>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Attributes:</td>
<td>Global:</td>
<td>Block:</td>
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<tr>
<td></td>
<td>Search:</td>
<td>Link:</td>
</tr>
<tr>
<td>Current Value:</td>
<td>No restrictions</td>
<td></td>
</tr>
</tbody>
</table>

### $P_OPMODE

**Description:**
The variable $P_OPMODE determines the mode selected via the PLC.

The variable returns the following values:
0: JOG (manual traverse)
1: MDA (Manual Data Automatic)
2: AUTOMATIC

<table>
<thead>
<tr>
<th>Axis Identifier:</th>
<th>NCK Version:</th>
<th>48.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit:</td>
<td>-</td>
<td>0 - 2</td>
</tr>
<tr>
<td>Run-in:</td>
<td>Main Run:</td>
<td>Runin Stp:</td>
</tr>
<tr>
<td>PP</td>
<td>SA</td>
<td>OPI</td>
</tr>
<tr>
<td>Access Rights:</td>
<td>Read:</td>
<td>Write:</td>
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<tr>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Attributes:</td>
<td>Global:</td>
<td>Block:</td>
</tr>
<tr>
<td></td>
<td>Search:</td>
<td>Link:</td>
</tr>
<tr>
<td>Not classified</td>
<td>Not classified</td>
<td></td>
</tr>
</tbody>
</table>
### 1.3 Channel-specific system variables

<table>
<thead>
<tr>
<th>DOUBLE</th>
<th>$P_TOFF[n]$</th>
<th>description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$P_TOFF$</td>
<td>Programmed tool length offset.</td>
<td>The variable returns the tool length offset which is assigned to the geometry axis defined as an index. The system variable returns the offset values assigned to the tool length components irrespective of whether the offsets have been programmed with TOFFL or TOFF.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>GEOAX</th>
<th>NCK version:</th>
<th>69.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit:</td>
<td>mm</td>
<td>min.:</td>
<td>DBL_MIN</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin slp</td>
<td>Mrun syn</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
<td>link</td>
</tr>
<tr>
<td>access rights:</td>
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<td>Not classified</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DOUBLE</th>
<th>$AC_TOFFL[3]$</th>
<th>description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$AC_TOFFL$</td>
<td>Programmed tool length offset.</td>
<td>The variable returns the offset assigned in $AC_TOFFL[1]$ to the tool length component L1. The same applies to indices 2 and 3. $AC_TOFFL[0]$ accesses the offset of the length component L1 in the same way as $AC_TOFFL[1]$. The system variable returns the offset values assigned to the tool length components irrespective of whether the offsets have been programmed with TOFFL or TOFF.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>NCK version:</th>
<th>69.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit:</td>
<td>mm</td>
<td>min.:</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin slp</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
</tr>
<tr>
<td>access rights:</td>
<td>Not classified</td>
<td>Not classified</td>
</tr>
</tbody>
</table>
1.3 Channel-specific system variables

**DOUBLE $P_TOFFL[3]**

description:
$P_TOFFL$
Programmed tool length offset.
The variable returns the offset assigned to the tool length component L1 in $P_TOFFL[1]$. The same applies to indices 2 and 3.
$P_TOFFL[0]$ accesses the offset of the length component L1 in the same way as $P_TOFFL[1]$. The system variable returns the offset values assigned to the tool length components irrespective of whether the offsets have been programmed with TOFFL or TOFF.

description of field limits:
to be defined
axis identifier: NCK version: 69.00.00
unit: mm min.: DBL_MIN max.: DBL_MAX
run-in main run runin stp Mrun syn PP SA OPI OEM access
read: X X
write: X
attributes: global block search link
Not classified Not classified

**DOUBLE $AC_TOFF[n]**

description:
$AC_TOFF$
Programmed tool length offset.
The variable returns the tool length offset which is assigned to the geometry axis defined as an index. The system variable returns the offset values assigned to the tool length components irrespective of whether the offsets have been programmed with TOFFL or TOFF.

description of field limits:
to be defined
axis identifier: GEOAX NCK version: 69.00.00
unit: mm min.: DBL_MIN max.: DBL_MAX
run-in main run runin stp Mrun syn PP SA OPI OEM access
read: X X X X
write: X X X
attributes: global block search link
Not classified Not classified
1.3 Channel-specific system variables

**BOOL** $AC_JOG_CIRCLE_SELECTED

description:
TRUE: JOG in circles is selected.
The function is selected via the NC/PLC interface signal DB21-30 DBX30.6 (no tool change commands),
and the selection is confirmed via DB21 Dbb377.6.

The maximum and minimum circles and the machining characteristics are defined by setting data:
- $SC_JOG_CIRCLE_CENTRE defines the center of the circle,
- $SC_JOG_CIRCLE_RADIUS the radius of the circle
- $SC_JOG_CIRCLE_MODE the machining characteristics
  (Traversing clockwise or anticlockwise on a circular path, internal or external machining;
  Limitation of the circle with or without taking the tool radius compensation into account).
- $SC_JOG_CIRCLE_START_ANGLE defines the starting angle
- $SC_JOG_CIRCLE_END_ANGLE defines the end angle

**DOUBLE** $P_TOFFR

description:
$P_TOFFR
Programmed tool radius offset.
The variable returns the tool radius offset programmed with TOFFR.

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>NCK version:</th>
<th>69.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>run-in</td>
<td></td>
<td></td>
</tr>
<tr>
<td>main run</td>
<td></td>
<td></td>
</tr>
<tr>
<td>runin sip</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mrun syn</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OPT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OEM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>access rights</td>
<td></td>
<td></td>
</tr>
<tr>
<td>read:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>attributes:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Not classified

Not classified
### $AC_TOFFR

**Description:**
Programmed tool radius offset.

The variable returns the tool radius offset programmed with TOFFR.

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>Unit</th>
<th>Min.</th>
<th>Max.</th>
<th>NCK Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>$P_TOFFR</td>
<td>mm</td>
<td>DBL_MIN</td>
<td>DBL_MAX</td>
<td>69.00.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Run-In</th>
<th>Main Run</th>
<th>Run-In SL</th>
<th>Mrun Syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

**Attributes:**
- Global
- Block Search
- Link

### $AC_STOP_COND[10]

**Description:**
The field variable $AC_STOP_COND[n] determines the events that led to machining stopping in the channel. The events are coded as positive numerical values in the field elements (see user documentation for meanings). The field element with the field index 0 corresponds to the highest priority event, higher indexed elements return correspondingly lower priority events. If the nth field element returns the value 0, this means that there are no further stop events.

**Description of Field Limits:**
To be defined

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>Unit</th>
<th>Min.</th>
<th>Max.</th>
<th>NCK Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>$AC_STOP_COND[10]</td>
<td>-</td>
<td>0</td>
<td>INT_MAX</td>
<td>70.00.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Run-In</th>
<th>Main Run</th>
<th>Run-In SL</th>
<th>Mrun Syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

**Attributes:**
- Global
- Block Search
- Link

Not classified

Not classified
### Channel-specific system variables

#### $P\_RELFRAME

| Description: | The variable $P\_RELFRAME is used for programming the active system frame for relative coordinate systems. The system frame is configured in the following machine data: | |  |
| Bit 11 in $MC\_MM\_SYSTEM\_FRAME\_MASK | Bit 11 in $MC\_MM\_SYSTEM\_DATAFRAME\_MASK | Bit 11 in $MC\_CHSF\_FRAME\_RESET\_MASK | Bit 11 in $MC\_CHSF\_FRAME\_RESET\_CLEAR\_MASK | Bit 11 in $MC\_CHSF\_FRAME\_POWERON\_MASK |
| Identifier: | GEOAX | CHANAX | MACHAX | SPINDLE | NCK version: | 70.00.00 |
| Unit: | - | min.: | DBL_MIN | max.: | DBL_MAX |
| run-in | main run | runin slp | Mrun syn | PP | SA | OPT | OEM | access rights |
| read: | X | | | | X | X |
| write: | X | | | | X | 7 |
| Attributes: | global | block search | link |
| Not classified | No restrictions |

#### $P\_INCOAP\_B[n]

| Description: | Defining and return parameters of the COA application "Cutting generator". |
| Description of field limits: | to be defined |
| Identifier: | | NCK version: | 71.00.00 |
| Unit: | - | min.: | FALSE | max.: | TRUE |
| run-in | main run | runin slp | Mrun syn | PP | SA | OPT | OEM | access rights |
| read: | X | | | | X | X |
| write: | X | | | | X | 7 |
| Attributes: | global | block search | link |
| Not classified | Not classified |
### 1 System variable

#### 1.3 Channel-specific system variables

<table>
<thead>
<tr>
<th>CHAR $P_{INCOAP_C}[n]$</th>
<th>description:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Defining and return parameters of the COA application &quot;Cutting generator&quot;.</td>
</tr>
<tr>
<td>description of field limits:</td>
<td></td>
</tr>
<tr>
<td>to be defined</td>
<td></td>
</tr>
<tr>
<td>axis identifier:</td>
<td></td>
</tr>
<tr>
<td>NCK version: 71.00.00</td>
<td></td>
</tr>
<tr>
<td>unit:</td>
<td></td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
</tr>
<tr>
<td>Not classified</td>
<td>Not classified</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>INT $P_{INCOAP_I}[n]$</th>
<th>description:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Defining and return parameters of the COA application &quot;Cutting generator&quot;.</td>
</tr>
<tr>
<td>description of field limits:</td>
<td></td>
</tr>
<tr>
<td>to be defined</td>
<td></td>
</tr>
<tr>
<td>axis identifier:</td>
<td></td>
</tr>
<tr>
<td>NCK version: 71.00.00</td>
<td></td>
</tr>
<tr>
<td>unit:</td>
<td></td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
</tr>
<tr>
<td>Not classified</td>
<td>Not classified</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DOUBLE $P_{INCOAP_R}[n]$</th>
<th>description:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Defining and return parameters of the COA application &quot;Cutting generator&quot;.</td>
</tr>
<tr>
<td>description of field limits:</td>
<td></td>
</tr>
<tr>
<td>to be defined</td>
<td></td>
</tr>
<tr>
<td>axis identifier:</td>
<td></td>
</tr>
<tr>
<td>NCK version: 71.00.00</td>
<td></td>
</tr>
<tr>
<td>unit:</td>
<td></td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
</tr>
<tr>
<td>Not classified</td>
<td>Not classified</td>
</tr>
</tbody>
</table>
### STRING $P_INCOAP_S16[n]$

<table>
<thead>
<tr>
<th>Description:</th>
<th>Defining and return parameters of the COA application &quot;Cutting generator&quot;.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description of field limits:</td>
<td>to be defined</td>
</tr>
<tr>
<td>Axis identifier:</td>
<td></td>
</tr>
<tr>
<td>Minimum:</td>
<td></td>
</tr>
<tr>
<td>Maximum:</td>
<td></td>
</tr>
<tr>
<td>Unit:</td>
<td></td>
</tr>
<tr>
<td>Read:</td>
<td>X</td>
</tr>
<tr>
<td>Write:</td>
<td>X</td>
</tr>
<tr>
<td>Attributes:</td>
<td>global block search link</td>
</tr>
<tr>
<td>Not classified</td>
<td>Not classified</td>
</tr>
</tbody>
</table>

### STRING $P_INCOAP_S32[n]$

<table>
<thead>
<tr>
<th>Description:</th>
<th>Defining and return parameters of the COA application &quot;Cutting generator&quot;.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description of field limits:</td>
<td>to be defined</td>
</tr>
<tr>
<td>Axis identifier:</td>
<td></td>
</tr>
<tr>
<td>Minimum:</td>
<td></td>
</tr>
<tr>
<td>Maximum:</td>
<td></td>
</tr>
<tr>
<td>Unit:</td>
<td></td>
</tr>
<tr>
<td>Read:</td>
<td>X</td>
</tr>
<tr>
<td>Write:</td>
<td>X</td>
</tr>
<tr>
<td>Attributes:</td>
<td>global block search link</td>
</tr>
<tr>
<td>Not classified</td>
<td>Not classified</td>
</tr>
</tbody>
</table>

### STRING $P_INCOAP_S160[n]$

<table>
<thead>
<tr>
<th>Description:</th>
<th>Defining and return parameters of the COA application &quot;Cutting generator&quot;.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description of field limits:</td>
<td>to be defined</td>
</tr>
<tr>
<td>Axis identifier:</td>
<td></td>
</tr>
<tr>
<td>Minimum:</td>
<td></td>
</tr>
<tr>
<td>Maximum:</td>
<td></td>
</tr>
<tr>
<td>Unit:</td>
<td></td>
</tr>
<tr>
<td>Read:</td>
<td>X</td>
</tr>
<tr>
<td>Write:</td>
<td>X</td>
</tr>
<tr>
<td>Attributes:</td>
<td>global block search link</td>
</tr>
<tr>
<td>Not classified</td>
<td>Not classified</td>
</tr>
</tbody>
</table>
### 1 System variable

#### 1.3 Channel-specific system variables

<table>
<thead>
<tr>
<th>INT</th>
<th>$P_{_INCOAP_SIZE}[n]$</th>
<th>description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$P_{_INCOAP_SIZE}[_]$ returns the currently available array size of the defining and return parameter $P_{_INCOAP_&lt;_type&gt;}$ of the COA application &quot;Cutting generator&quot;. The array size is variable, and is defined by the COA application during power-up.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NCK version:</th>
<th>71.00.00</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>unit:</th>
<th>INT_MAX</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>main run</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>attributes:</th>
<th>global</th>
<th>block</th>
<th>search</th>
<th>link</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not classified</td>
<td>Not classified</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DOUBLE</th>
<th>$__AC__SMAXVELO[n]$</th>
<th>description</th>
</tr>
</thead>
<tbody>
<tr>
<td>$__AC__SMAXVELO[n]$</td>
<td>Maximum possible spindle speed</td>
<td></td>
</tr>
<tr>
<td>n: Number of the spindle</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The variable returns the maximum possible spindle for the spindle mode. This is formed from the lowest value of the active speed limitations, and cannot be exceeded by speed programming or override > 100%.

A speed limitation is displayed by the VDI interface signal DB31..DBX83.1 'Setpoint speed limited' and by $\_\_AC\_\_SPIND\_STATE$, Bit 10 (speed limitation active).

The cause of the speed limitation can also be determined with the system variable $\_\_AC\_\_SMAXVELO\_INFO$.

In axis mode, the limitation can be read with internal system variables.

<table>
<thead>
<tr>
<th>NCK version:</th>
<th>71.00.00</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>unit:</th>
<th>DBL_MAX</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>main run</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>attributes:</th>
<th>global</th>
<th>block</th>
<th>search</th>
<th>link</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not classified</td>
<td>Not classified</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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SINUMERIK 840D sl/840Di sl/ 840D/ 840Di, List of System Variables (PGA1), 01/2008
1.3 Channel-specific system variables

### $AC_SMAXVELO_INFO[n]$

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of the spindle Identifier (info) for the speed limiting data (machine/setting data, etc.). The system variable is additional information to $AC_SMAXVELO$, and returns the definitive data as an identifier/index. The value read can be used to determine the speed limiting data from the following table.</td>
<td></td>
</tr>
</tbody>
</table>

#### Field limits:
- **n**: Spindle number
- **unit**: -
- **min.**: 0
- **max.**: 17
- **read**: 
  - X
  - X
  - X
  - X
  - X
  - X
- **write**: 
  - X
  - Not classified
- **attributes**: 
  - global
  - Not classified
### System variable

#### 1.3 Channel-specific system variables

<table>
<thead>
<tr>
<th>DOUBLE</th>
<th>$AC_SMINVELO[n]$</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>n: Number of the spindle</td>
<td>Minimum possible spindle speed</td>
<td></td>
</tr>
</tbody>
</table>

The variable returns the minimum possible spindle for open-loop speed control mode. This is formed from the highest speed increase, and cannot be undershot by speed programming or override < 100%

A speed increase is displayed by the VDI interface signal DB31...DBX83.2 'Setpoint speed increased' and by $AC\_SPIND\_STATE$, bit 11 (setpoint speed increased).

The cause of the increase in speed (machine or setting data, G code, VDI interface etc.) can also be determined with the system variable $AC\_SMINVELO\_INFO$.

The increase in speed is effective only if the spindle is in open-loop speed control mode. The system variable always returns the definitive value for the open-loop speed control mode, even if the spindle is in positioning or axis mode.

#### description of field limits:

<table>
<thead>
<tr>
<th>n: Spindle number</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>NCK version:</th>
<th>71.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit: rpm</td>
<td>min.: 0</td>
<td>max.: DBL_MAX</td>
</tr>
<tr>
<td>run-in main run runin slp Mrun syn PP SA OI UEM access rights</td>
<td>X X X X X</td>
<td></td>
</tr>
<tr>
<td>attributes:</td>
<td>global block search link</td>
<td>X Not classified Not classified</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>INT</th>
<th>$AC_SMINVELO_INFO[n]$</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>n: Number of the spindle</td>
<td>Identifier (info) for the speed-increasing data (machine/setting data etc.).</td>
<td></td>
</tr>
</tbody>
</table>

The system variable is additional information to $AC\_SMINVELO$, and returns the speed-increasing data as an identifier/index for the open-loop speed control mode. The index can be used to determine the speed-increasing data from the following table.

- 0 Not used
- 1 Not used
- 2 Lower speed limit (minimum speed) of the current gear stage MD 35140 GEAR\_STEP\_MIN\_VELO\_LIMIT
- 3 Not used
- 4 Not used
- 5 Lower speed limit (minimum speed) from SD 43210 SPIND\_MIN\_VELO\_G25 (G25 S.. or preset by HMI)

#### description of field limits:

| n: Spindle number |
### 1.3 Channel-specific system variables

#### INT

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>$$AC_SMINVELO_INFO[n]$</td>
<td>Identifier (info) for the speed-increasing data (machine/setting data etc.). The system variable is additional information to $$AC_SMINVELO$, and returns the speed-increasing data as an identifier/index for the open-loop speed control mode. The index can be used to determine the speed-increasing data from the following table.</td>
</tr>
</tbody>
</table>

#### DOUBLE

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>$$AC_SMAXACC[n]$</td>
<td>Effective acceleration of the spindle. The variable returns the effective acceleration of the spindle for the spindle mode.</td>
</tr>
</tbody>
</table>

description of field limits:

<table>
<thead>
<tr>
<th>n: Spindle number</th>
</tr>
</thead>
<tbody>
<tr>
<td>axis identifier:</td>
</tr>
<tr>
<td>unit: rps²</td>
</tr>
<tr>
<td>min.: 0</td>
</tr>
<tr>
<td>max.: DBL_MAX</td>
</tr>
<tr>
<td>read: X X X X X X X X</td>
</tr>
<tr>
<td>write: X</td>
</tr>
<tr>
<td>attributes: global block search link</td>
</tr>
<tr>
<td>access rights: X Not classified Not classified</td>
</tr>
</tbody>
</table>
### 1.3 Channel-specific system variables

<table>
<thead>
<tr>
<th>INT</th>
<th>description:</th>
<th>n: Number of the spindle</th>
</tr>
</thead>
<tbody>
<tr>
<td>$AC_SMAXACC_INFO[n]$</td>
<td>Identifier (info) for the machine data of the currently active spindle acceleration.</td>
<td></td>
</tr>
</tbody>
</table>

The system variable is additional information to $AC\_SMAXACC$, and returns the definitive data as an identifier/index. The index can be used to determine the active acceleration data from the following table.

The number range is defined by the system variable $AC\_SMAXVELO\_INFO$:

<table>
<thead>
<tr>
<th>n</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No acceleration limitation (SERUPRO)</td>
</tr>
<tr>
<td>1</td>
<td>Not used</td>
</tr>
<tr>
<td>2</td>
<td>Acceleration in speed control mode without position control in the current gear stage MD 35200 GEAR_STEP_SPEEDCTRL_ACCEL * ACC * ACCFXS</td>
</tr>
<tr>
<td>3</td>
<td>Not used</td>
</tr>
<tr>
<td>4</td>
<td>Acceleration in the current gear stage on account of position control MD 35210 GEAR_STEP_POSCTRL_ACCEL * ACC * ACCFXS (SPCON, SPOS, possibly with COUPON...)</td>
</tr>
<tr>
<td>5</td>
<td>Not used</td>
</tr>
<tr>
<td>6</td>
<td>Not used</td>
</tr>
<tr>
<td>7</td>
<td>Not used</td>
</tr>
<tr>
<td>8</td>
<td>Not used</td>
</tr>
<tr>
<td>9</td>
<td>Acceleration limited by the preparation calculations</td>
</tr>
<tr>
<td>10</td>
<td>Not used</td>
</tr>
<tr>
<td>11</td>
<td>Not used</td>
</tr>
<tr>
<td>12</td>
<td>Acceleration of the slave spindle limited by axis mode, which is forced by the master spindle</td>
</tr>
<tr>
<td>13</td>
<td>Acceleration limitation of the overlaid motion of the slave spindle to the dynamic remaining after the coupling</td>
</tr>
<tr>
<td>14</td>
<td>Acceleration of the master spindle limited by lack of dynamic in the slave spindle or a high gear ratio</td>
</tr>
<tr>
<td>15</td>
<td>Acceleration of the master spindle MD 35212 GEAR_STEP_POSCTRL_ACCEL2 while tapping with G331, G332 (only with corresponding configuration of the second data record)</td>
</tr>
<tr>
<td>16</td>
<td>Not used</td>
</tr>
<tr>
<td>17</td>
<td>Acceleration limited by tool parameter $TC_TP_MAX_ACCEL$</td>
</tr>
</tbody>
</table>

**description of field limits:**

<table>
<thead>
<tr>
<th>n: Spindle number</th>
<th>axis identifier:</th>
<th>NCK version: 71.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit:</td>
<td>run-in</td>
<td>main run</td>
</tr>
<tr>
<td></td>
<td>min.:</td>
<td>0</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td>Not classified</td>
</tr>
</tbody>
</table>
1.3 Channel-specific system variables

<table>
<thead>
<tr>
<th>INT</th>
<th>$AC_SPIND_STATE[n]</th>
<th>description</th>
</tr>
</thead>
<tbody>
<tr>
<td>n</td>
<td>Number of the spindle</td>
<td></td>
</tr>
</tbody>
</table>

The variable returns selected states of the spindle.

- Bit 0: "Constant cutting speed active" (VDI interface signal DB31..DBX84.0)
- Bit 1: "GWPS active" (VDI interface signal DB31..DBX84.1)
- Bit 2: "CLGON active" (VDI interface signal DB31..DBX84.2)
- Bit 3: "Tapping without compensating chuck" (VDI interface signal DB31..DBX84.3)
- Bit 4: "Synchronous mode" (slave spindle with synchronous spindle coupling) (VDI interface signal DB31..DBX84.4)
- Bit 5: "Positioning mode" (VDI interface signal DB31..DBX84.5)
- Bit 6: "Oscillation mode" (gear stage change) (VDI interface signal DB31..DBX84.6)
- Bit 7: "Open-loop speed control mode" (VDI interface signal DB31..DBX84.7)
- Bit 8: "Spindle programmed" (e.g. M3, M4 S... FC18, ...) (VDI interface signal DB31..DBX84.8)
- Bit 9: "Speed limit exceeded" (VDI interface signal DB31..DBX83.0)
- Bit 10: "Setpoint speed limited" (VDI interface signal DB31..DBX83.1) active when, as a result of programming or override, the speed would become greater than the maximum possible speed ($AC_SMAXVELO)
- Bit 11: "Setpoint speed increased" (VDI interface signal DB31..DBX83.2) active when, as a result of programming or override, the speed would become less than the minimum possible speed (system variable $AC_SMINVELO)
- Bit 12: "Spindle in set range" (VDI interface signal DB31..DBX83.5)
- Bit 13: "Actual direction of rotation right" (VDI interface signal DB31..DBX83.7)
- Bit 14: "Spindle accelerates", active as long as the spindle is accelerating to the defined setpoint speed on the setpoint side.
- Bit 15: "Spindle brakes", active as long as the spindle is braking to the defined setpoint speed or to a stop on the setpoint side.
- Bit 16: "Spindle stationary" (VDI interface signal DB31..DBX61.4)
- Bit 17: "Tool with dynamic limitation active" (VDI interface signal DB31..DBX85.0)
- Bit 18: Reserved
- Bit 19: "Spindle in position" (VDI interface signal DB31..DBX85.5)
- Bit 20: "Position control active" (VDI interface signal DB31..DBX61.5)
- Bit 21: "Referenced/synchronized 1" (VDI interface signal DB31..DBX60.4)
- Bit 22: "Referenced/synchronized 2" (VDI interface signal DB31..DBX60.5)

The variable $AA_INPOS_STATE[Sn] can also be read for positioning and axis mode.

<table>
<thead>
<tr>
<th>INT</th>
<th>$AA_INPOS_STATE[Sn]</th>
<th>description</th>
</tr>
</thead>
<tbody>
<tr>
<td>n</td>
<td>Spindle number</td>
<td></td>
</tr>
</tbody>
</table>

**Description of field limits:**

- **axis identifier:** NCK version: 71.00.00
- **unit:** - min.: 0 max.: 2097151
- **run-in main run runin slip Mrun syn PP SA OPI OEM access rights**
- **read:** X X X X X X X X
- **write:**
- **attributes:** global block search link
- **access rights:**
- **value:** X Not classified Not classified
### 1.3 Channel-specific system variables

<table>
<thead>
<tr>
<th>INT</th>
<th>$P_{ISO2_HNO}[n]$</th>
<th>description</th>
</tr>
</thead>
</table>
|     |                  | Contains the offset numbers of $H$ selected for the 3 geometry dimensions. (Tool length offset) Indexing corresponding to $P_{TOOLL}[n]$.
|     |                  | Value = -1: $H99$ is programmed, or it has been activated in Siemens mode $D1$.
|     |                  | = -2: A $D\geq 2$ has been programmed in Siemens mode
|     |                  | = -3: It cannot be activated in ISO2 mode. |
|     |                  | description of field limits: |
|     |                  | to be defined |
|     |                  | axis identifier: |
|     |                  | NCK version: 72.00.00 |
|     |                  | unit: - min.: -3 max.: INT_MAX |
|     |                  | run-in main run runin stp Mrun syn PP SA OPT OEM access rights |
|     |                  | read: XX X X |
|     |                  | write: |
|     |                  | attributes: global block search link |
|     |                  | Not classified No restrictions |

<table>
<thead>
<tr>
<th>INT</th>
<th>$P_{ISO2_DNO}$</th>
<th>description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Contains the offset number $D$ selected for the radius</td>
<td></td>
</tr>
</tbody>
</table>
|     | Value = -1: $H99$ is programmed, or it has been activated in Siemens mode $D1$.
|     | = -2: A $D\geq 2$ has been programmed in Siemens mode
|     | = -3: It cannot be activated in ISO2 mode. |
|     | axis identifier: |
|     | NCK version: 72.00.00 |
|     | unit: - min.: -3 max.: INT_MAX |
|     | run-in main run runin stp Mrun syn PP SA OPT OEM access rights |
|     | read: XX X X |
|     | write: |
|     | attributes: global block search link |
|     | Not classified No restrictions |
1.4 Frames

- **$P_ISO3_DNO**
  - **Description:**
    - Contains the offset number of H selected for ISO3 mode.
    - Value = -1: H99 is programmed, or it has been activated in Siemens mode D1.
    - Value = -2: A D>2 has been programmed in Siemens mode.
    - Value = -3: It cannot be activated in ISO2 mode.
  - **Axis Identifier:** NCK version: 72.00.00
  - **Unit:** INT
  - **Run-in:** main run, runin stp
  - **Mrun syn:** PP, SA, OPT, OEM
  - **Access Rights:** read: X, write: X
  - **Attributes:** global, search, link
  - **Field Limits:**
    - **NCK version:** 72.00.00
    - **Axis Identifier:** NCK version: 06.00.00
    - **Unit:** INT
    - **Run-in:** main run, runin stp
    - **Mrun syn:** PP, SA, OPT, OEM
    - **Access Rights:** read: X, write: X
    - **Attributes:** global, search, link
    - **Field Limits:**
      - **Not classified:** No restrictions
1.4 Frames

FRAME: $P\_CHBFR[n]$

description:
Array variable $P\_CHBFR[n]$ is used to program channel-specific basic frames in the data management system. G500, G54 .. G599 can be used to activate the data management frames. All active basic frames are chained together to produce the overall basic frame $P\_ACTBFRAME$. The data management frames are stored in SRAM and can be read in and out using the data backup feature.

description of field limits:
$MC\_MM\_NUM\_BASE\_FRAMES$ is used to program the number of channel basic frames.

axis identifier: 
NCK version: 16.00.00
unit: - min.: max.:

run-in main run runin stp Mrun syn PP SA OPI OEM access rights

read: X X X X
write: X X X 7
attributes: global block search link

Not classified No restrictions

FRAME: $P\_SETFR$

description:
Variable $P\_SETFR$ is used to program the system frame in the data management system for preset actual value memory and scratching. This frame should only be manipulated and activated by the system function. The data management frames are stored in SRAM and can be read in and out using the data backup feature.

On a Reset, the system frame can be cleared by configuring Bit 0 in $MC\_CHSFRAME\_RESET\_CLEAR\_MASK$.

axis identifier: GEOAX CHANAX MACHAX SPINDLE
NCK version: 41.00.00
unit: - min.: DBL_MIN max.: DBL_MAX

run-in main run runin stp Mrun syn PP SA OPI OEM access rights

read: X X X X
write: X X X 7
attributes: global block search link

Not classified No restrictions
1.4 Frames

<table>
<thead>
<tr>
<th>FRAME</th>
<th>description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$P_EXTFR</td>
<td>Variable $P_EXTFR is used to program the system frame in the data management system for the external work offset. This frame is activated by the PLC. The data management frames are stored in SRAM and can be read in and out using the data backup feature. On a Reset, the system frame can be cleared by configuring Bit 1 in $MC_CHSFRAME_RESET_CLEAR_MASK.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>MACHAX</th>
<th>SPINDLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCK version:</td>
<td></td>
<td></td>
<td></td>
<td>41.00.00</td>
</tr>
<tr>
<td>unit:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>run-in</td>
<td>-</td>
<td>min.:</td>
<td>DBL_MIN</td>
<td>max.:</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>7</td>
</tr>
<tr>
<td>attributes:</td>
<td>global block search</td>
<td>link</td>
<td></td>
<td></td>
</tr>
<tr>
<td>access rights:</td>
<td>Not classified</td>
<td>No restrictions</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FRAME</th>
<th>description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$P_PARTFR</td>
<td>Variable $P_PARTFR is used to program the system frame in the data management system for TCARR and PAROT. This frame should only be manipulated and activated by the system function. The data management frames are stored in SRAM and can be read in and out using the data backup feature.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>MACHAX</th>
<th>SPINDLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCK version:</td>
<td></td>
<td></td>
<td></td>
<td>41.00.00</td>
</tr>
<tr>
<td>unit:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>run-in</td>
<td>-</td>
<td>min.:</td>
<td>DBL_MIN</td>
<td>max.:</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>7</td>
</tr>
<tr>
<td>attributes:</td>
<td>global block search</td>
<td>link</td>
<td></td>
<td></td>
</tr>
<tr>
<td>access rights:</td>
<td>Not classified</td>
<td>No restrictions</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## FRAME: $P\_TOOLFR

| description: Variable $P\_TOOLFR is used to program the system frame in the data management system for TOROT and TOFRAME. This frame should only be manipulated and activated by the system function. The data management frames are stored in SRAM and can be read in and out using the data backup feature. |
| axis identifier: GEOAX CHANAX MACHAX SPINDLE |
| unit: - min.: DBL_MIN max.: DBL_MAX |
| run-in main run runin slp Mrun syn PP SA OPT OEM access rights read: X X X write: X X X 7 |
| attributes: global block search link |
| Not classified No restrictions |

## FRAME: $P\_WPFR

| description: Variable $P\_WPFR is used to program the system frame in the data management system for workpiece reference points. The data management frames are stored in SRAM and can be read in and out using the data backup feature. On a Reset, the system frame can be cleared by configuring Bit 4 in $MC\_CHSFRAME\_RESET\_CLEAR\_MASK. |
| axis identifier: GEOAX CHANAX MACHAX SPINDLE |
| unit: - min.: DBL_MIN max.: DBL_MAX |
| run-in main run runin slp Mrun syn PP SA OPT OEM access rights read: X X X write: X X X 7 |
| attributes: global block search link |
| Not classified No restrictions |
### 1.4 Frames

#### FRAME: $P_CYCFR

**description:**
Variable $P_CYCFR is used to program the system frame in the data management system for cycles. This frame should only be manipulated and activated by cycles. The data management frames are stored in SRAM and can be read in and out using the data backup feature.
On a Reset, the system frame can be cleared by configuring Bit 5 in $MC_CHSFRAME_RESET_CLEAR_MASK.

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>MACHAX</th>
<th>SPINDLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCK version</td>
<td></td>
<td></td>
<td></td>
<td>44.00.00</td>
</tr>
<tr>
<td>unit</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>min. run-in</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>max. run-in</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>run-slip</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>run-syn</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PP</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>SA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OPI</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OEM</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>access rights</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>read</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>write</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>7</td>
</tr>
<tr>
<td>attributes</td>
<td>global block search</td>
<td>sink</td>
<td>Not classified No restrictions</td>
<td></td>
</tr>
</tbody>
</table>

#### FRAME: $P_TRAFR

**description:**
Variable $P_TRAFR is used to program the system frame in the data management system for transformations. This frame should only be manipulated and activated by the system function. The data management frames are stored in SRAM and can be read in and out using the data backup feature.

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>MACHAX</th>
<th>SPINDLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCK version</td>
<td></td>
<td></td>
<td></td>
<td>50.00.00</td>
</tr>
<tr>
<td>unit</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>min. run-in</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>max. run-in</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>run-slip</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>run-syn</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PP</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>SA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OPI</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OEM</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>access rights</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>read</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>write</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>7</td>
</tr>
<tr>
<td>attributes</td>
<td>global block search</td>
<td>sink</td>
<td>Not classified No restrictions</td>
<td></td>
</tr>
</tbody>
</table>
### FRAME: $P_ISO1FR

**description:**  
Variable $P_ISO1FR is used to program the system frame in the data management for the ISO G code G51.1 mirroring. This frame should only be manipulated and activated via the system function. The data management frames are stored in SRAM and can be read in and out using the data backup feature. On reset, the system frame can be deleted via the configuration of bit 0 in $MC_CHSFRAME_RESET_CLEAR_MASK.

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>MACHAX</th>
<th>SPINDLE</th>
<th>NCK version: 66.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit: -</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>min.:</td>
<td>DBL_MIN</td>
<td>max.:</td>
<td>DBL_MAX</td>
<td></td>
<td></td>
</tr>
<tr>
<td>run-in run main run runin slp Mrun syn PP SA OPI OEM access rights</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block</td>
<td>search</td>
<td>link</td>
<td></td>
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<tr>
<td>classification:</td>
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<td>No restrictions</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### FRAME: $P_ISO2FR

**description:**  
Variable $P_ISO2FR is used to program the system frame in the data management for the ISO G68 2DROT. This frame should only be manipulated and activated via the system function. The data management frames are stored in SRAM and can be read in and out using the data backup feature. On reset, the system frame can be deleted via the configuration of bit 0 in $MC_CHSFRAME_RESET_CLEAR_MASK.

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>MACHAX</th>
<th>SPINDLE</th>
<th>NCK version: 66.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit: -</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>min.:</td>
<td>DBL_MIN</td>
<td>max.:</td>
<td>DBL_MAX</td>
<td></td>
<td></td>
</tr>
<tr>
<td>run-in run main run runin slp Mrun syn PP SA OPI OEM access rights</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block</td>
<td>search</td>
<td>link</td>
<td></td>
</tr>
<tr>
<td>classification:</td>
<td>Not classified</td>
<td>No restrictions</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### 1.4 Frames

<table>
<thead>
<tr>
<th>FRAME: $P_ISO3FR</th>
<th>description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>description: Variable $P_ISO3FR is used to program the system frame in the data management for the ISO G68 3DROT. This frame should only be manipulated and activated via the system function. The data management frames are stored in SRAM and can be read in and out using the data backup feature. On reset, the system frame can be deleted via the configuration of bit 0 in $MC_CHSFRAME_RESET_CLEAR_MASK.</td>
<td></td>
</tr>
<tr>
<td>axis identifier: GEOAX CHANAX MACHAX SPINDLE</td>
<td>NCK version: 66.00.00</td>
</tr>
<tr>
<td>unit: -</td>
<td>min.: DBL_MIN</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
</tr>
<tr>
<td>read: X</td>
<td>X</td>
</tr>
<tr>
<td>write: X</td>
<td>X</td>
</tr>
<tr>
<td>attributes: global block search link</td>
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<th>FRAME: $P_ISO4FR</th>
<th>description:</th>
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</thead>
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<tr>
<td>description: Variable $P_ISO4FR is used to program the system frame in the data management for the ISO G code G51 Scale. This frame should only be manipulated and activated via the system function. The data management frames are stored in SRAM and can be read in and out using the data backup feature. On reset, the system frame can be deleted via the configuration of bit 0 in $MC_CHSFRAME_RESET_CLEAR_MASK.</td>
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<td>axis identifier: GEOAX CHANAX MACHAX SPINDLE</td>
<td>NCK version: 66.00.00</td>
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<tr>
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### 1.4 Frames

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<th>$P_{RELFR}$</th>
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<td>The variable $P_{RELFR}$ is used for programming the system frame in the data management for relative coordinate systems. This frame should only be activated and manipulated via the system function. The data management frames are stored in the SRAM, and can be read in and out via the data backup. The system frame is configured in the following machine data:</td>
</tr>
<tr>
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<td></td>
<td>Bit 11 in $MC_{MM_SYSTEM_FRAME_MASK}$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bit 11 in $MC_{MM_SYSTEM_DATAFRAME_MASK}$</td>
</tr>
<tr>
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<td></td>
<td>Bit 11 in $MC_{CHSF_FRAME_RESET_MASK}$</td>
</tr>
<tr>
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<td></td>
<td>Bit 11 in $MC_{CHSF_FRAME_RESET_CLEAR_MASK}$</td>
</tr>
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<td></td>
<td></td>
<td>Bit 11 in $MC_{CHSF_FRAME_POWERON_MASK}$</td>
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<td></td>
<td>SPINDLE</td>
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<td>-</td>
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<td>main run</td>
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</tr>
<tr>
<td>runin stp</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mrun syn</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PP</td>
<td>SA</td>
<td>OPI</td>
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<td>X</td>
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<tr>
<td></td>
<td>Array variable $P_{NCBFR}[n]$ is used to program global basic frames in the data management system. G500, G54 ... G599 can be used to activate the data management frames. All active basic frames are chained together to produce the overall basic frame $P_{ACTBF_FRAME}$. The data management frames are stored in SRAM and can be read in and out using the data backup feature.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>description of field limits:</td>
<td></td>
</tr>
<tr>
<td>$MN_{MM_NUM_GLOBAL_BASE_FRAMES}$ is used to program the number of NCU basic frames.</td>
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<td></td>
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<td>NCK version: 16.00.00</td>
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<tr>
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<tr>
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<td>runin stp</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
</tr>
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### 1.5 Tool carrier data

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<td>$TC_CARR1[n]$</td>
<td>x component of offset vector l1</td>
<td>Attention! All system parameters beginning with '$TC_ ' are parameters belonging to the TOA area. The special characteristic of this area is that machine data 28085 = MM_LINK_TOA_UNIT can be set to allow different NCK channels to access these parameters. If this type of parameter setting has been selected by the NCK, you must be aware that changing these data can have a negative impact on other channels. Before you change any data settings, make sure that the changes will have only a local effect on the channel in which they are made.</td>
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<tr>
<td>NCK version: 13.00.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>axis identifier:</td>
<td>mm min.: DBL_MIN max.: DBL_MAX</td>
<td></td>
</tr>
<tr>
<td>run-in</td>
<td>main run runin stp Mrun syn PP SA OPI OEM access rights</td>
<td></td>
</tr>
<tr>
<td>read:</td>
<td>X X X</td>
<td></td>
</tr>
<tr>
<td>write:</td>
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<tr>
<td>attributes:</td>
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<td>Y component of offset vector l1</td>
<td>description of field limits: The maximum number of tool carriers can be set in</td>
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<tr>
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<tr>
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<tr>
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</table>
### $TC_CARR3[n]$ Description:

$TC_CARR3[n]$  
Z component of offset vector l1

**Description of field limits:**

The maximum number of tool carriers can be set in

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<th>min.:</th>
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<th>max.:</th>
<th>DBL_MAX</th>
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<th>main run</th>
<th>runin slips</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
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**Read:** X  
**Write:** X

**Attributes:** global, block, search, link

Not classified  
No restrictions

### $TC_CARR4[n]$ Description:

$TC_CARR4[n]$  
X component of offset vector l2

**Description of field limits:**

The maximum number of tool carriers can be set in

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>NCK version:</th>
<th>min.:</th>
<th>DBL_MIN</th>
<th>max.:</th>
<th>DBL_MAX</th>
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<th>main run</th>
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<th>Mrun syn</th>
<th>PP</th>
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<th>OPT</th>
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**Read:** X  
**Write:** X

**Attributes:** global, block, search, link

Not classified  
No restrictions

### $TC_CARR5[n]$ Description:

$TC_CARR5[n]$  
Y component of offset vector l2

**Description of field limits:**

The maximum number of tool carriers can be set in

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<th>min.:</th>
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<th>max.:</th>
<th>DBL_MAX</th>
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<th>runin slips</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
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**Read:** X  
**Write:** X

**Attributes:** global, block, search, link

Not classified  
No restrictions
### TOOL CARRIER DATA

**$TC_CARR6[n]$**

**Description:**

$TC_CARR6[n]$  
Z component of offset vector l2

**Field limits:**

The maximum number of tool carriers can be set in

<table>
<thead>
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<th>axis identifier</th>
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</tr>
</thead>
<tbody>
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**Access:**

Not classified  
No restrictions

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**$TC_CARR7[n]$**

**Description:**

$TC_CARR7[n]$  
X component of rotary axis v1

**Field limits:**

The maximum number of tool carriers can be set in

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**Access:**

Not classified  
No restrictions

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**$TC_CARR8[n]$**

**Description:**

$TC_CARR8[n]$  
Y component of rotary axis v1

**Field limits:**

The maximum number of tool carriers can be set in

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**Access:**

Not classified  
No restrictions
### $TC_CARR9[n]$

**Z component of rotary axis v1**

**Description of field limits:**
The maximum number of tool carriers can be set in

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</table>

### $TC_CARR10[n]$

**X component of rotary axis v2**

**Description of field limits:**
The maximum number of tool carriers can be set in

<table>
<thead>
<tr>
<th>Axis identifier:</th>
<th>NCK version:</th>
<th>DBL_MIN</th>
<th>DBL_MAX</th>
<th>run-in</th>
<th>main run</th>
<th>runin slop</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
</tr>
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<tbody>
<tr>
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<tr>
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<td>X</td>
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<tr>
<td>write:</td>
<td>X</td>
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<td></td>
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<td></td>
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</tr>
<tr>
<td>Write rights:</td>
<td>XX 7</td>
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### $TC_CARR11[n]$

**Y component of rotary axis v2**

**Description of field limits:**
The maximum number of tool carriers can be set in

<table>
<thead>
<tr>
<th>Axis identifier:</th>
<th>NCK version:</th>
<th>DBL_MIN</th>
<th>DBL_MAX</th>
<th>run-in</th>
<th>main run</th>
<th>runin slop</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
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<tr>
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<td></td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>write:</td>
<td>X</td>
<td>X</td>
<td></td>
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<td>Read rights:</td>
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<td></td>
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<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Write rights:</td>
<td>XX 7</td>
<td>XX</td>
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### Tool carrier data

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
<th>Field Limits</th>
<th>Access Rights</th>
<th>Attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>$TC_CARR12[n]$</td>
<td>Z component of rotary axis v2</td>
<td>DBL_MIN to DBL_MAX</td>
<td>read: X write: X</td>
<td>global, block, search, link</td>
</tr>
<tr>
<td>$TC_CARR13[n]$</td>
<td>Angle of rotation alpha1 (in degrees)</td>
<td>DBL_MIN to DBL_MAX</td>
<td>read: X write: X</td>
<td>global, block, search, link</td>
</tr>
<tr>
<td>$TC_CARR14[n]$</td>
<td>Angle of rotation alpha2 (in degrees)</td>
<td>DBL_MIN to DBL_MAX</td>
<td>read: X write: X</td>
<td>global, block, search, link</td>
</tr>
</tbody>
</table>
### Tool carrier data

**DOUBLE $TC_CARR15[n]$**

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<tr>
<th>Description:</th>
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</thead>
<tbody>
<tr>
<td>$TC_CARR15[n]$</td>
</tr>
<tr>
<td>X component of offset vector l3</td>
</tr>
</tbody>
</table>

**Description of field limits:**
The maximum number of tool carriers can be set in

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<thead>
<tr>
<th>Axis identifier:</th>
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<tr>
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<table>
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<tr>
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<th>min.:</th>
<th>DBL_MIN</th>
<th>max.:</th>
<th>DBL_MAX</th>
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<tbody>
<tr>
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<table>
<thead>
<tr>
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<th>Write:</th>
</tr>
</thead>
<tbody>
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**DOUBLE $TC_CARR16[n]$**

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<tr>
<th>Description:</th>
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<tbody>
<tr>
<td>$TC_CARR16[n]$</td>
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<td>Y component of offset vector l3</td>
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</tbody>
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**Description of field limits:**
The maximum number of tool carriers can be set in

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<thead>
<tr>
<th>Axis identifier:</th>
<th>NCK version:</th>
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</thead>
<tbody>
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<td>14.00.00</td>
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<table>
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<th>min.:</th>
<th>DBL_MIN</th>
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<table>
<thead>
<tr>
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<th>Write:</th>
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</thead>
<tbody>
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<td>block search</td>
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</table>

**DOUBLE $TC_CARR17[n]$**

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<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$TC_CARR17[n]$</td>
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<td>Z component of offset vector l3</td>
</tr>
</tbody>
</table>

**Description of field limits:**
The maximum number of tool carriers can be set in

<table>
<thead>
<tr>
<th>Axis identifier:</th>
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</thead>
<tbody>
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<table>
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<th>min.:</th>
<th>DBL_MIN</th>
<th>max.:</th>
<th>DBL_MAX</th>
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</thead>
<tbody>
<tr>
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<table>
<thead>
<tr>
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<tbody>
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1.5 Tool carrier data

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<td>X component of offset vector l4</td>
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<td>description of field limits:</td>
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<tr>
<td>axis identifier:</td>
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<tr>
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<td>mm</td>
<td>run-in</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td></td>
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<tr>
<td>attributes:</td>
<td>global</td>
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<tbody>
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<td>description:</td>
<td>$TC_CARR19[n]$</td>
<td>Y component of offset vector l4</td>
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<tr>
<td>description of field limits:</td>
<td></td>
<td>The maximum number of tool carriers can be set in</td>
</tr>
<tr>
<td>axis identifier:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>unit:</td>
<td>mm</td>
<td>run-in</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td></td>
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<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
</tr>
<tr>
<td>access rights:</td>
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<tr>
<td>Not classified</td>
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<thead>
<tr>
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<tbody>
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<tr>
<td>description of field limits:</td>
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<td>The maximum number of tool carriers can be set in</td>
</tr>
<tr>
<td>axis identifier:</td>
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<tr>
<td>unit:</td>
<td>mm</td>
<td>run-in</td>
</tr>
<tr>
<td>read:</td>
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<td>write:</td>
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<tr>
<td>attributes:</td>
<td>global</td>
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<tr>
<td>access rights:</td>
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</table>
### AXIS \$TC\_CARR21[n]

**description:**

\$TC\_CARR21[n]

Axis identifier of 1st rotary axis

**description of field limits:**

The maximum number of tool carriers can be set in

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<tbody>
<tr>
<td>unit:</td>
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<td>min.: max.:</td>
</tr>
<tr>
<td>run-in main run runin slp Mrun syn PP SA OPI OEM access rights</td>
<td></td>
<td></td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
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<td>attributes:</td>
<td>global block search link</td>
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<td>Not classified No restrictions</td>
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### AXIS \$TC\_CARR22[n]

**description:**

\$TC\_CARR22[n]

Axis identifier of 2nd rotary axis

**description of field limits:**

The maximum number of tool carriers can be set in

<table>
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<tbody>
<tr>
<td>unit:</td>
<td>-</td>
<td>min.: max.:</td>
</tr>
<tr>
<td>run-in main run runin slp Mrun syn PP SA OPI OEM access rights</td>
<td></td>
<td></td>
</tr>
<tr>
<td>read:</td>
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<td>attributes:</td>
<td>global block search link</td>
<td></td>
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<td>Not classified No restrictions</td>
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### CHAR \$TC\_CARR23[n]

**description:**

\$TC\_CARR23[n]

Type of kinematics: P: Rotatable workpiece (Part)
M: Rotatable tool and rotatable workpiece (Mixed)
T or any other character apart from P and M: Rotatable tool

**description of field limits:**

The maximum number of tool carriers can be set in

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>NCK version:</th>
<th>20.00.00</th>
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</thead>
<tbody>
<tr>
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<td>-</td>
<td>min.: max.:</td>
</tr>
<tr>
<td>run-in main run runin slp Mrun syn PP SA OPI OEM access rights</td>
<td></td>
<td></td>
</tr>
<tr>
<td>read:</td>
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<tr>
<td>write:</td>
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<td>attributes:</td>
<td>global block search link</td>
<td></td>
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<tr>
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### Tool Carrier Data

#### $TC\_CARR24[n]$

<table>
<thead>
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<th>Description:</th>
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<tbody>
<tr>
<td>Offset of 1st rotary axis in degrees</td>
</tr>
<tr>
<td>Specifies the angle in degrees of the 1st rotary axis at which the axis assumes its initial position.</td>
</tr>
</tbody>
</table>

**Description of Field Limits:**
- The maximum number of tool carriers can be set in NCK version: 43.00.00
- Unit: DBL_MIN
- Run-in: X
- Read: X
- Write: X

**Attributes:**
- Global
- Link

**Access Rights:**
- Not classified
- No restrictions

### $TC\_CARR25[n]$

<table>
<thead>
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<th>Description:</th>
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<tbody>
<tr>
<td>Offset of 2nd rotary axis in degrees</td>
</tr>
<tr>
<td>Specifies the angle in degrees of the 2nd rotary axis at which the axis assumes its initial position.</td>
</tr>
</tbody>
</table>

**Description of Field Limits:**
- The maximum number of tool carriers can be set in NCK version: 43.00.00
- Unit: DBL_MIN
- Run-in: X
- Read: X

**Attributes:**
- Global
- Link

**Access Rights:**
- Not classified
- No restrictions

### $TC\_CARR26[n]$

<table>
<thead>
<tr>
<th>Description:</th>
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<tbody>
<tr>
<td>Specifies the offset of the 1st rotary axis if its position is not continuously variable (Hirth tooth system).</td>
</tr>
<tr>
<td>This variable is evaluated only if $TC_CARR28$ is set to a value other than zero.</td>
</tr>
<tr>
<td>For exact meanings, please refer to the description of $TC_CARR28$</td>
</tr>
</tbody>
</table>

**Description of Field Limits:**
- The maximum number of tool carriers can be set in NCK version: 43.00.00
- Unit: DBL_MIN
- Run-in: X
- Read: X

**Attributes:**
- Global
- Link

**Access Rights:**
- Not classified
- No restrictions
### 1.5 Tool carrier data

#### $TC_CARR27[n]$

**Description:**
Specifies the offset of the 2nd rotary axis if its position is not continuously variable (Hirth tooth system).

This variable is evaluated only if $TC_CARR29$ is set to a value other than zero.

For exact meanings, please refer to the description of $TC_CARR29$.

**Description of field limits:**

The maximum number of tool carriers can be set in

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</thead>
<tbody>
<tr>
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<td>DBL_MIN</td>
<td>DBL_MAX</td>
</tr>
<tr>
<td>main run</td>
<td>runin slip</td>
<td>Mrun syn</td>
</tr>
<tr>
<td>PP</td>
<td>SA</td>
<td>OPT</td>
</tr>
<tr>
<td>access rights</td>
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<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td>7</td>
</tr>
</tbody>
</table>

**Attributes:**

- global
- block search
- link

- Not classified
- No restrictions

---

#### $TC_CARR28[n]$

**Description:**
Specifies the size of the minimum increment (in degrees) by which the 1st rotary axis can change position (e.g. with Hirth tooth systems).

A programmed or calculated angle is rounded to the nearest value calculated from $\phi = s + n \times d$

when $n$ is an integer.

In this equation

$s = $TC_CARR28$

$d = $TC_CARR26$

If $TC_CARR28$ equals zero, $TC_CARR26$ and $TC_CARR28$ are not used.

The settings in machine data $MC_TOCARR_ROT_ANGLE_INCR[i]$ and $MC_TOCARR_ROT_ANGLE_OFFSET[i]$ are applied instead.

**Description of field limits:**

The maximum number of tool carriers can be set in

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>NCK version:</th>
</tr>
</thead>
<tbody>
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<table>
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<th>max.</th>
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</thead>
<tbody>
<tr>
<td>run-in</td>
<td>DBL_MIN</td>
<td>DBL_MAX</td>
</tr>
<tr>
<td>main run</td>
<td>runin slip</td>
<td>Mrun syn</td>
</tr>
<tr>
<td>PP</td>
<td>SA</td>
<td>OPT</td>
</tr>
<tr>
<td>access rights</td>
<td></td>
<td></td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td>7</td>
</tr>
</tbody>
</table>

**Attributes:**

- global
- block search
- link

- Not classified
- No restrictions
### $TC\_CARR29[n]$ Description:

Specifies the size of the minimum increment (in degrees) by which the 2nd rotary axis can change position (e.g. with Hirth tooth systems). A programmed or calculated angle is rounded to the nearest value calculated from $\phi = s + n \times d$ when $n$ is an integer.

In this equation

\[
s = \text{\$TC\_CARR29}
\]

\[
d = \text{\$TC\_CARR27}
\]

If $\text{\$TC\_CARR29}$ equals zero, $\text{\$TC\_CARR27}$ and $\text{\$TC\_CARR29}$ are not used. The settings in machine data $\text{\$MC\_TOCARR\_ROT\_ANGLE\_INCR[i]}$ and $\text{\$MC\_TOCARR\_ROT\_ANGLE\_OFFSET[i]}$ are applied instead.

**Description of Field Limits:**

The maximum number of tool carriers can be set in

<table>
<thead>
<tr>
<th>axis identifier</th>
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</tr>
</thead>
<tbody>
<tr>
<td>unit:</td>
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</tr>
<tr>
<td>run-in</td>
<td>DBL_MAX</td>
</tr>
<tr>
<td>run-in</td>
<td>DBL_MAX</td>
</tr>
<tr>
<td>main run</td>
<td>DBL_MAX</td>
</tr>
<tr>
<td>runin slip</td>
<td>DBL_MAX</td>
</tr>
<tr>
<td>Mrun syn</td>
<td>DBL_MAX</td>
</tr>
<tr>
<td>PP</td>
<td>DBL_MAX</td>
</tr>
<tr>
<td>SA</td>
<td>DBL_MAX</td>
</tr>
<tr>
<td>OPT</td>
<td>DBL_MAX</td>
</tr>
<tr>
<td>OEM</td>
<td>DBL_MAX</td>
</tr>
<tr>
<td>access rights</td>
<td></td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
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<td>write:</td>
<td>X</td>
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<td>block search</td>
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<tr>
<td></td>
<td>Global</td>
</tr>
<tr>
<td></td>
<td>Link</td>
</tr>
</tbody>
</table>

**Not classified**

**No restrictions**

### $TC\_CARR30[n]$ Description:

Specifies the minimum position of the 1st rotary axis. For full description, see $\text{\$TC\_CARR32}$

**Description of Field Limits:**

The maximum number of tool carriers can be set in

<table>
<thead>
<tr>
<th>axis identifier</th>
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</tr>
</thead>
<tbody>
<tr>
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<tr>
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<td>DBL_MAX</td>
</tr>
<tr>
<td>run-in</td>
<td>DBL_MAX</td>
</tr>
<tr>
<td>main run</td>
<td>DBL_MAX</td>
</tr>
<tr>
<td>runin slip</td>
<td>DBL_MAX</td>
</tr>
<tr>
<td>Mrun syn</td>
<td>DBL_MAX</td>
</tr>
<tr>
<td>PP</td>
<td>DBL_MAX</td>
</tr>
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<td>SA</td>
<td>DBL_MAX</td>
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<tr>
<td>OPT</td>
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<tr>
<td>OEM</td>
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<tr>
<td>access rights</td>
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<td>read:</td>
<td>X</td>
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<td>attributes:</td>
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<tr>
<td></td>
<td>Global</td>
</tr>
<tr>
<td></td>
<td>Link</td>
</tr>
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</table>

**Not classified**

**No restrictions**
### $TC_CARR31[n]$

**Description:**
Specifies the minimum position of the 2nd rotary axis. For full description, see $TC_CARR33$

**Limit Description:**
The maximum number of tool carriers can be set in

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>NCK Version</th>
<th>Unit</th>
<th>Min.:</th>
<th>Max.:</th>
</tr>
</thead>
<tbody>
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<td>-</td>
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<table>
<thead>
<tr>
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<th>Main Run</th>
<th>Run In Slip</th>
<th>Mrun Syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
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**Attributes:**
Global, Block Search, Link

- Not classified
- No restrictions

### $TC_CARR32[n]$

**Description:**
Specifies the maximum position of the 1st rotary axis.
When the angle of the 1st rotary axis of an orientable tool carrier aligned according to a frame (TCOFR) is calculated, the only acceptable solutions are those which lie within the $TC_CARR30$ to $TC_CARR32$ range.

The same applies when the rotary angle is programmed absolutely (TCOABS).
The limits are not evaluated if both $TC_CARR30$ and $TC_CARR32$ equal zero.

**Limit Description:**
The maximum number of tool carriers can be set in

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>NCK Version</th>
<th>Unit</th>
<th>Min.:</th>
<th>Max.:</th>
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</thead>
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<table>
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<tr>
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<th>Main Run</th>
<th>Run In Slip</th>
<th>Mrun Syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
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**Attributes:**
Global, Block Search, Link

- Not classified
- No restrictions
### 1.5 Tool carrier data

#### DOUBLE $TC\_CARR33[n]$

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</tr>
</thead>
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<td>max.:</td>
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<tr>
<td>run-in</td>
<td></td>
<td>DBL_MAX</td>
</tr>
<tr>
<td>main run</td>
<td>runin stp</td>
<td>Mrun syn</td>
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<tr>
<td>PP</td>
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<td>access rights</td>
<td></td>
<td></td>
</tr>
<tr>
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<td>X</td>
<td></td>
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<tr>
<td>write: X</td>
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</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
</tr>
<tr>
<td></td>
<td>Not classified</td>
<td>No restrictions</td>
</tr>
</tbody>
</table>

**description:**

$TC\_CARR33[n]$

Specifies the maximum position of the 2nd rotary axis.

When the angle of the 2nd rotary axis of an orientable tool carrier aligned according to a frame (TCOFR) is calculated, the only acceptable solutions are those which lie within the $TC\_CARR31$ to $TC\_CARR33$ range.

The same applies when the rotary angle is programmed absolutely (TCOABS).

The limits are not evaluated if both $TC\_CARR31$ and $TC\_CARR33$ equal zero.

**description of field limits:**

The maximum number of tool carriers can be set in

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>unit:</th>
<th>NCK version:</th>
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</tr>
</thead>
<tbody>
<tr>
<td>min.:</td>
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<td>runin stp</td>
<td>Mrun syn</td>
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<td>PP</td>
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</tr>
<tr>
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#### STRING $TC\_CARR34[n]$

<table>
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<tr>
<th>axis identifier:</th>
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</tr>
</thead>
<tbody>
<tr>
<td>unit:</td>
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<td>max.:</td>
</tr>
<tr>
<td>run-in</td>
<td></td>
<td>DBL_MAX</td>
</tr>
<tr>
<td>main run</td>
<td>runin stp</td>
<td>Mrun syn</td>
</tr>
<tr>
<td>PP</td>
<td>SA</td>
<td>OPI</td>
</tr>
<tr>
<td>access rights</td>
<td></td>
<td></td>
</tr>
<tr>
<td>read: X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>write: X</td>
<td>X</td>
<td>7</td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
</tr>
<tr>
<td></td>
<td>Not classified</td>
<td>No restrictions</td>
</tr>
</tbody>
</table>

**description:**

$TC\_CARR34[n]$

Contains a freely definable string. This is provided as a free identifier for the orientable tool carrier.

However, it currently has no significance within the NCK, and is therefore not evaluated.

This identifier should not be used for other purposes as it may be used in a future upgrade to allow the activation of an orientable tool carrier via a name rather than a number.
### 1.5 Tool carrier data

<table>
<thead>
<tr>
<th>STRING</th>
</tr>
</thead>
<tbody>
<tr>
<td>$TC_CARR35[n]$</td>
</tr>
<tr>
<td>description:</td>
</tr>
<tr>
<td>$TC_CARR35[n]$ Contains a freely definable string. This is provided as a free identifier for the first rotary axis. Within the NCK, however, it has no significance at all and is therefore not evaluated. It can also be used for any other purpose.</td>
</tr>
<tr>
<td>description of field limits:</td>
</tr>
<tr>
<td>The maximum number of tool carriers can be set in</td>
</tr>
<tr>
<td>axis identifier:</td>
</tr>
<tr>
<td>NCK version: 48.00.00</td>
</tr>
<tr>
<td>unit: - min.: max.:</td>
</tr>
<tr>
<td>run-in</td>
</tr>
<tr>
<td>read: X</td>
</tr>
<tr>
<td>write: X</td>
</tr>
<tr>
<td>attributes: global</td>
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<tr>
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</table>

<table>
<thead>
<tr>
<th>STRING</th>
</tr>
</thead>
<tbody>
<tr>
<td>$TC_CARR36[n]$</td>
</tr>
<tr>
<td>description:</td>
</tr>
<tr>
<td>$TC_CARR36[n]$ Contains a freely definable string. This is provided as a free identifier for the second rotary axis. Within the NCK, however, it has no significance at all and is therefore not evaluated. It can also be used for any other purpose.</td>
</tr>
<tr>
<td>description of field limits:</td>
</tr>
<tr>
<td>The maximum number of tool carriers can be set in</td>
</tr>
<tr>
<td>axis identifier:</td>
</tr>
<tr>
<td>NCK version: 48.00.00</td>
</tr>
<tr>
<td>unit: - min.: max.:</td>
</tr>
<tr>
<td>run-in</td>
</tr>
<tr>
<td>read: X</td>
</tr>
<tr>
<td>write: X</td>
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<tr>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>INT</th>
</tr>
</thead>
<tbody>
<tr>
<td>$TC_CARR37[n]$</td>
</tr>
<tr>
<td>description:</td>
</tr>
<tr>
<td>$TC_CARR37[n]$ Contains an integer number for identifying the toolholder. Within the NCK, however, it has no significance at all and is therefore not evaluated.</td>
</tr>
<tr>
<td>description of field limits:</td>
</tr>
<tr>
<td>The maximum number of tool carriers can be set in</td>
</tr>
<tr>
<td>axis identifier:</td>
</tr>
<tr>
<td>NCK version: 48.00.00</td>
</tr>
<tr>
<td>unit: - min.: max.:</td>
</tr>
<tr>
<td>run-in</td>
</tr>
<tr>
<td>read: X</td>
</tr>
<tr>
<td>write: X</td>
</tr>
<tr>
<td>attributes: global</td>
</tr>
<tr>
<td>Not classified</td>
</tr>
</tbody>
</table>
### Tool Carrier Data

#### $TC\text{\_CARR38}[n]$

**Description:**
Contains a position (X component of retraction position).
Within the NCK, however, it has no significance at all and is therefore not evaluated.

**Description of Field Limits:**
The maximum number of tool carriers can be set in:
- NCK version: 48.00.00
- Unit: -
- Run-In: main run
- Run-In Stp: M run syn
- PP: SA
- OPI: OEM
- Attributes: global, block search, link
- Not classified, No restrictions

#### $TC\text{\_CARR39}[n]$

**Description:**
Contains a position (Y component of retraction position).
Within the NCK, however, it has no significance at all and is therefore not evaluated.

**Description of Field Limits:**
The maximum number of tool carriers can be set in:
- NCK version: 48.00.00
- Unit: -
- Run-In: main run
- Run-In Stp: M run syn
- PP: SA
- OPI: OEM
- Attributes: global, block search, link
- Not classified, No restrictions

#### $TC\text{\_CARR40}[n]$

**Description:**
Contains a position (Z component of retraction position).
Within the NCK, however, it has no significance at all and is therefore not evaluated.

**Description of Field Limits:**
The maximum number of tool carriers can be set in:
- NCK version: 48.00.00
- Unit: -
- Run-In: main run
- Run-In Stp: M run syn
- PP: SA
- OPI: OEM
- Attributes: global, block search, link
- Not classified, No restrictions
### DOUBLE $TC_CARR41[n]$ Description:

X component of fine offset of offset vector l1

**Description of field limits:**

The maximum number of tool carriers can be set in

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>NCK version:</th>
<th>mm</th>
<th>min.:</th>
<th>DBL_MIN</th>
<th>max.:</th>
<th>DBL_MAX</th>
<th>run-in</th>
<th>main run</th>
<th>runin slp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
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<tbody>
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### DOUBLE $TC_CARR42[n]$ Description:

Y component of fine offset of offset vector l1

**Description of field limits:**

The maximum number of tool carriers can be set in

<table>
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<th>min.:</th>
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<th>max.:</th>
<th>DBL_MAX</th>
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<th>main run</th>
<th>runin slp</th>
<th>Mrun syn</th>
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<th>OPT</th>
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### DOUBLE $TC_CARR43[n]$ Description:

Z component of fine offset of offset vector l1

**Description of field limits:**

The maximum number of tool carriers can be set in

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<th>DBL_MIN</th>
<th>max.:</th>
<th>DBL_MAX</th>
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<th>main run</th>
<th>runin slp</th>
<th>Mrun syn</th>
<th>PP</th>
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<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
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</table>
**DOUBLE** $TC\_CARR44[n]$

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</tr>
<tr>
<td>X component of fine offset of offset vector l2</td>
</tr>
</tbody>
</table>

**description of field limits:**
The maximum number of tool carriers can be set in

<table>
<thead>
<tr>
<th>axis identifier:</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCK version:</td>
</tr>
<tr>
<td>52.00.00</td>
</tr>
</tbody>
</table>

| unit: |
| mm |
| min.: |
| DBL\_MIN |
| max.: |
| DBL\_MAX |

| run-in |
| main run |
| runin slip |
| Mrun syn |
| PP |
| SA |
| OPT |
| OEM |
| access rights |
| read: |
| X |
| write: |
| X |
| attributes: |
| global |
| block search |
| link |
| Not classified |
| No restrictions |

**DOUBLE** $TC\_CARR45[n]$

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$TC_CARR45[n]$</td>
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<tr>
<td>Y component of fine offset of offset vector l2</td>
</tr>
</tbody>
</table>

**description of field limits:**
The maximum number of tool carriers can be set in

<table>
<thead>
<tr>
<th>axis identifier:</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCK version:</td>
</tr>
<tr>
<td>52.00.00</td>
</tr>
</tbody>
</table>

| unit: |
| mm |
| min.: |
| DBL\_MIN |
| max.: |
| DBL\_MAX |

| run-in |
| main run |
| runin slip |
| Mrun syn |
| PP |
| SA |
| OPT |
| OEM |
| access rights |
| read: |
| X |
| write: |
| X |
| attributes: |
| global |
| block search |
| link |
| Not classified |
| No restrictions |

**DOUBLE** $TC\_CARR46[n]$

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$TC_CARR46[n]$</td>
</tr>
<tr>
<td>Z component of fine offset of offset vector l2</td>
</tr>
</tbody>
</table>

**description of field limits:**
The maximum number of tool carriers can be set in

<table>
<thead>
<tr>
<th>axis identifier:</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCK version:</td>
</tr>
<tr>
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</tr>
</tbody>
</table>

| unit: |
| mm |
| min.: |
| DBL\_MIN |
| max.: |
| DBL\_MAX |

| run-in |
| main run |
| runin slip |
| Mrun syn |
| PP |
| SA |
| OPT |
| OEM |
| access rights |
| read: |
| X |
| write: |
| X |
| attributes: |
| global |
| block search |
| link |
| Not classified |
| No restrictions |
### Tool carrier data

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
<th>Field limits</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>$TC_CARR55[n]</td>
<td>X component of fine offset of offset vector I3</td>
<td></td>
<td></td>
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<tr>
<td>$TC_CARR56[n]</td>
<td>Y component of fine offset of offset vector I3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$TC_CARR57[n]</td>
<td>Z component of fine offset of offset vector I3</td>
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### $TC_CARR58[n]$

**description:**

$TC_CARR58[n]$

X component of fine offset of offset vector l4

**description of field limits:**

The maximum number of tool carriers can be set in

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<th>unit</th>
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<th>max.</th>
<th>DBL_MAX</th>
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<th>main run</th>
<th>runin stp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
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</tr>
<tr>
<td>read:</td>
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<td></td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
<td>link</td>
<td>Not classified</td>
<td>No restrictions</td>
<td></td>
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</tr>
</tbody>
</table>

**DOUBLE**

### $TC_CARR59[n]$

**description:**

$TC_CARR59[n]$

Y component of fine offset of offset vector l4

**description of field limits:**

The maximum number of tool carriers can be set in

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>unit</th>
<th>min.</th>
<th>DBL_MIN</th>
<th>max.</th>
<th>DBL_MAX</th>
<th>run-in</th>
<th>main run</th>
<th>runin stp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td></td>
<td></td>
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<td></td>
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<td>attributes:</td>
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</tr>
</tbody>
</table>

**DOUBLE**

### $TC_CARR60[n]$

**description:**

$TC_CARR60[n]$

Z component of fine offset of offset vector l4

**description of field limits:**

The maximum number of tool carriers can be set in

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<th>axis identifier</th>
<th>unit</th>
<th>min.</th>
<th>DBL_MIN</th>
<th>max.</th>
<th>DBL_MAX</th>
<th>run-in</th>
<th>main run</th>
<th>runin stp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
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<td>DBL_MIN</td>
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<td>DBL_MAX</td>
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<td></td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
<td>link</td>
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<td>No restrictions</td>
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<td></td>
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</tr>
</tbody>
</table>
### $TC\_CARR64[n]$ double

**description:**

$TC\_CARR64[n]$

Fine offset of offset ($TC\_CARR24$) of 1st rotary axis in degrees

**description of field limits:**

The maximum number of tool carriers can be set in an axis identifier:

<table>
<thead>
<tr>
<th>NCK version:</th>
<th>52.00.00</th>
</tr>
</thead>
</table>

**unit:**

<table>
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<tr>
<th>run-in</th>
<th>main run</th>
<th>runin slp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
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**read:**

<table>
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<tr>
<th>run-in</th>
<th>main run</th>
<th>runin slp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
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<td></td>
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</table>

**write:**

<table>
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<tr>
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<th>runin slp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
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</tbody>
</table>

**attributes:**

<table>
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<th>main run</th>
<th>runin slp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>global</td>
<td>block search</td>
<td>link</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Not classified
No restrictions

---

### $TC\_CARR65[n]$ double

**description:**

$TC\_CARR65[n]$

Fine offset of offset ($TC\_CARR25$) of 2nd rotary axis in degrees

**description of field limits:**

The maximum number of tool carriers can be set in an axis identifier:

<table>
<thead>
<tr>
<th>NCK version:</th>
<th>52.00.00</th>
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**unit:**

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<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
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<th>access rights</th>
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<tbody>
<tr>
<td>-</td>
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<td></td>
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</tr>
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</table>

**read:**

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<th>runin slp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
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<td></td>
<td></td>
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<td></td>
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</tr>
</tbody>
</table>

**write:**

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<th>runin slp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
<td></td>
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</tbody>
</table>

**attributes:**

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<th>run-in</th>
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<th>runin slp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>global</td>
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<td>link</td>
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<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Not classified
No restrictions
1.6 Channel-specific protect

**BOOL** \$SC_PA_ACTIV_IMMED[n]

<table>
<thead>
<tr>
<th>description:</th>
<th>Protection zone immediately active after boot</th>
</tr>
</thead>
<tbody>
<tr>
<td>$SC_PA_ACTIV_IMMED[n]</td>
<td>TRUE: The protection zone is activated immediately the control has booted and the axes have been referenced</td>
</tr>
<tr>
<td></td>
<td>FALSE: The protection zone is not immediately active</td>
</tr>
<tr>
<td>Note: This variable can only be written as a system variable and is not affected by the NC commands between NPROTDEF(...) and EXECUTE(n).</td>
<td></td>
</tr>
<tr>
<td>Note: This variable is not restored during REORG.</td>
<td></td>
</tr>
<tr>
<td>Note: This variable is saved during data backup.</td>
<td></td>
</tr>
</tbody>
</table>

**Blocks:** _N_NCK_PRO, _N_COMPLETE_PRO and _N_INITIAL_INI

**description of field limits:**

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<tr>
<th>axis identifier:</th>
<th>NCK version:</th>
<th>06.00.00</th>
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</thead>
<tbody>
<tr>
<td>unit:</td>
<td>run-in</td>
<td>main run</td>
</tr>
<tr>
<td></td>
<td>runin stp</td>
<td>Mrun syn</td>
</tr>
<tr>
<td></td>
<td>PP</td>
<td>SA</td>
</tr>
<tr>
<td></td>
<td>OEM</td>
<td>access</td>
</tr>
<tr>
<td></td>
<td>rights</td>
<td></td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
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<td>link</td>
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</tr>
<tr>
<td>Not classified</td>
<td>No restrictions</td>
<td></td>
</tr>
</tbody>
</table>

**CHAR** \$SC_PA_T_W[n]

<table>
<thead>
<tr>
<th>description:</th>
<th>Protection zone specific to workpiece/tool</th>
</tr>
</thead>
<tbody>
<tr>
<td>$SC_PA_T_W[n]</td>
<td>0: Workpiece-specific protection zone</td>
</tr>
<tr>
<td></td>
<td>3: Tool-specific protection zone</td>
</tr>
<tr>
<td>Note: This variable is not restored during REORG.</td>
<td></td>
</tr>
<tr>
<td>Note: This variable is saved during data backup.</td>
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</tr>
</tbody>
</table>

**Blocks:** _N_CHAx_PRO, _N_COMPLETE_PRO and _N_INITIAL_INI

**description of field limits:**

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<thead>
<tr>
<th>axis identifier:</th>
<th>NCK version:</th>
<th>06.00.00</th>
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</thead>
<tbody>
<tr>
<td>unit:</td>
<td>run-in</td>
<td>main run</td>
</tr>
<tr>
<td></td>
<td>runin stp</td>
<td>Mrun syn</td>
</tr>
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<td>PP</td>
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<tr>
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<td>OEM</td>
<td>access</td>
</tr>
<tr>
<td></td>
<td>rights</td>
<td></td>
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<tr>
<td>read:</td>
<td>X</td>
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<tr>
<td>write:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
</tr>
<tr>
<td></td>
<td>link</td>
<td></td>
</tr>
<tr>
<td>Not classified</td>
<td>No restrictions</td>
<td></td>
</tr>
</tbody>
</table>
## 1.6 Channel-specific protect

### $SC_{PA\_ORI}[n]$ (Orientation of protection zone)

**description:**

$SC_{PA\_ORI}[n]$ Orientation of protection zone

0: Polygon definition in the plane from the 1st and 2nd geo axes (G17)
1: Polygon definition in the plane from the 3rd and 1st geo axes (G18)
2: Polygon definition in the plane from the 2nd and 3rd geo axes (G19)

Note: This variable is not restored during REORG.

Note: This variable is saved during data backup.

Blocks: _N_CHAx_PRO, _N_COMPLETE_PRO and _N_INITIAL_INI

CHAx: x=channel no.

**Field limits:**

- **n:** Number of protection zone
- **axis:** Identifier: NCK version: 06.00.00
- **unit:** - min.: 0 max.: 2
- **run-in:** main run runin slp Mrun syn PP SA OPI OEM access rights
- **read:** X X X
- **write:** X X 7
- **attributes:** global block search link

Not classified No restrictions

### $SC_{PA\_LIM\_3DIM}[n]$ (Identifier for limitation of protection zone in the axis perpendicular to the polygon definition)

**description:**

$SC_{PA\_LIM\_3DIM}[n]$ Identifier for limitation of protection zone in the axis perpendicular to the polygon definition

0: No limitation
1: Limitation in the positive direction
2: Limitation in the negative direction
3: Limitation in both directions

Note: This variable is not restored during REORG.

Note: This variable is saved during data backup.

Blocks: _N_CHAx_PRO, _N_COMPLETE_PRO and _N_INITIAL_INI

CHAx: x=channel no.

**Field limits:**

- **n:** Number of protection zone
- **axis:** Identifier: NCK version: 06.00.00
- **unit:** - min.: 0 max.: 3
- **run-in:** main run runin slp Mrun syn PP SA OPI OEM access rights
- **read:** X X X
- **write:** X X 7
- **attributes:** global block search link

Not classified No restrictions
### 1.6 Channel-specific protect

#### $SC_PA_PLUS_LIM[n]$

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive limitation of protection zones in the axis perpendicular to the polygon definition. Effective only if $SC_PA_LIM_3DIM[n]=1$ or $=3$.</td>
</tr>
</tbody>
</table>

Note: This variable is not restored during REORG.

Note: This variable is saved during data backup.

Blocks: _N_CHAx_PRO, _N_COMPLETE_PRO and _N_INITIAL_INI

CHAx: x=channel no.

<table>
<thead>
<tr>
<th>Description of field limits:</th>
</tr>
</thead>
<tbody>
<tr>
<td>n: Number of protection zone</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
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<td>06.00.00</td>
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<table>
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<tr>
<th>Unit: mm</th>
<th>DBL_MIN</th>
<th>max.: DBL_MAX</th>
</tr>
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<table>
<thead>
<tr>
<th>Run-in</th>
<th>Main run</th>
<th>runin slip</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Attributes: global</th>
<th>block search</th>
<th>smx</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not classified</td>
<td>No restrictions</td>
<td></td>
</tr>
</tbody>
</table>

#### $SC_PA_MINUS_LIM[n]$

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative limitation of protection zone in minus direction in the axis perpendicular to the polygon definition. Effective only if $SC_PA_LIM_3DIM[n]=2$ or $=3$.</td>
</tr>
</tbody>
</table>

Note: This variable is not restored during REORG.

Note: This variable is saved during data backup.

Blocks: _N_CHAx_PRO, _N_COMPLETE_PRO and _N_INITIAL_INI

CHAx: x=channel no.

<table>
<thead>
<tr>
<th>Description of field limits:</th>
</tr>
</thead>
<tbody>
<tr>
<td>n: Number of protection zone</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NCK version:</th>
</tr>
</thead>
<tbody>
<tr>
<td>06.00.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit: mm</th>
<th>DBL_MIN</th>
<th>max.: DBL_MAX</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Run-in</th>
<th>Main run</th>
<th>runin slip</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Attributes: global</th>
<th>block search</th>
<th>smx</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not classified</td>
<td>No restrictions</td>
<td></td>
</tr>
</tbody>
</table>
### 1.6 Channel-specific protect

**INT $SC_PA_CONT_NUM[n]**

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$SC_PA_CONT_NUM[n]: Number of valid contour elements. Protection zones need at least 2 contour elements for a complete description.</td>
</tr>
</tbody>
</table>

Note: This variable is not restored during REORG.

Note: This variable is saved during data backup.

Blocks: N_CHAx_PRO, N_COMPLETE_PRO and N_INITIAL_INI

CHAx: x=channel no.

**description of field limits:**

- **n**: Number of protection zone

**axis identifier:**

- **NCK version:** 06.00.00

**unit:**

- **min.:** 0
- **max.:** 10

**run-in main run runin stp Mrun syn PP SA OPI OEM access rights**

**read:** X X X

**write:** X X X 7

**attributes:** global block search link

Not classified No restrictions

---

**INT $SC_PA_CONT_TYP[n,m]**

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$SC_PA_CONT_TYP[n,m]: Type (G1, G2, G3) of contour element. =0: Contour not defined =1: Straight =2: Circle element (clockwise) =3: Circle element (counterclockwise) The end point is determined by $SC_PA_CONT_ORD or $SC_PA_CONT_ABS. With contour types G2 and G3, $SC_PA_CENT_ORD or $SC_PA_CENT_ABS determines the center point of the circle element.</td>
</tr>
</tbody>
</table>

Note: This variable is not restored during REORG.

Note: This variable is saved during data backup.

Blocks: N_CHAx_PRO, N_COMPLETE_PRO and N_INITIAL_INI

CHAx: x=channel no.

**description of field limits:**

- **n**: Number of protection zone
- **m**: Number of the contour element

**axis identifier:**

- **NCK version:** 06.00.00

**unit:**

- **min.:** 0
- **max.:** 3

**run-in main run runin stp Mrun syn PP SA OPI OEM access rights**

**read:** X X X

**write:** X X X 7

**attributes:** global block search link

Not classified No restrictions
### $SC_{PA\_CONT\_ORD}[n,m]$

**Description:**

$SC_{PA\_CONT\_ORD}[n,m]$  
End point of contour element (ordinate)  
See also description of $SC_{PA\_CONT\_TYP}$

**Note:** This variable is not restored during REORG.

**Note:** This variable is saved during data backup.

**Blocks:** _N_CHAx_PRO, _N_COMPLETE_PRO and _N_INITIAL_INI  
CHAx: x=channel no.

**Description of field limits:**

- **n:** Number of protection zone  
- **m:** Number of the contour element

**Axis identifier:**

- NCK version: 06.00.00
- Unit: mm  
- min.: DBL_MIN  
- max.: DBL_MAX

<table>
<thead>
<tr>
<th>read</th>
<th>write</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>run-in</th>
<th>main run</th>
<th>runin slip</th>
<th>Mrun syn</th>
<th>Pp</th>
<th>Sa</th>
<th>Opt</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Attributes:**

- Global  
- Block search  
- Link

- Not classified  
- No restrictions

---

### $SC_{PA\_CONT\_ABS}[n,m]$

**Description:**

$SC_{PA\_CONT\_ABS}[n,m]$  
End point of contour element (abscissa)  
See also description of $SC_{PA\_CONT\_TYP}$

**Note:** This variable is not restored during REORG.

**Note:** This variable is saved during data backup.

**Blocks:** _N_CHAx_PRO, _N_COMPLETE_PRO and _N_INITIAL_INI  
CHAx: x=channel no.

**Description of field limits:**

- **n:** Number of protection zone  
- **m:** Number of the contour element

**Axis identifier:**

- NCK version: 06.00.00
- Unit: mm  
- min.: DBL_MIN  
- max.: DBL_MAX

<table>
<thead>
<tr>
<th>read</th>
<th>write</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>run-in</th>
<th>main run</th>
<th>runin slip</th>
<th>Mrun syn</th>
<th>Pp</th>
<th>Sa</th>
<th>Opt</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Attributes:**

- Global  
- Block search  
- Link

- Not classified  
- No restrictions
### $SC_PA_CENT_ORD[n,m]$

- **Description:**
  - $SC_PA_CENT_ORD[n,m]$  
  - Center point of contour element (ordinate)  
  - Relevant only if $SC_PA_CONT_TYP[n,m] = 2$ or $3$.  

- **Note:** This variable is not restored during REORG.  
- **Note:** This variable is saved during data backup.  
- **Blocks:** _N_CHAx_PRO, _N_COMPLETE_PRO, _N_INITIAL_INI  
  - CHAx: x=channel no.  

- **Axis identifier:**

<table>
<thead>
<tr>
<th>n</th>
<th>X</th>
<th>X</th>
<th>X</th>
<th>X</th>
<th>X</th>
<th>X</th>
<th>X</th>
<th>X</th>
<th>X</th>
<th>X</th>
<th>X</th>
<th>X</th>
<th>X</th>
<th>X</th>
</tr>
</thead>
<tbody>
<tr>
<td>m</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

- **Unit:** mm  
- **Minimum:** DBL_MIN  
- **Maximum:** DBL_MAX  
- **Access rights:** read: X, write: X  
- **Attributes:** global block search link  

### $SC_PA_CENT_ABS[n,m]$

- **Description:**
  - $SC_PA_CENT_ABS[n,m]$  
  - Center point of contour element (abscissa)  
  - Relevant only if $SC_PA_CONT_TYP[n,m] = 2$ or $3$.  

- **Note:** This variable is not restored during REORG.  
- **Note:** This variable is saved during data backup.  
- **Blocks:** _N_CHAx_PRO, _N COMPLETE_PRO, _N INITIAL_INI  
  - CHAx: x=channel no.  

- **Axis identifier:**

<table>
<thead>
<tr>
<th>n</th>
<th>X</th>
<th>X</th>
<th>X</th>
<th>X</th>
<th>X</th>
<th>X</th>
<th>X</th>
<th>X</th>
<th>X</th>
<th>X</th>
<th>X</th>
<th>X</th>
<th>X</th>
<th>X</th>
</tr>
</thead>
<tbody>
<tr>
<td>m</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

- **Unit:** mm  
- **Minimum:** DBL_MIN  
- **Maximum:** DBL_MAX  
- **Access rights:** read: X, write: X  
- **Attributes:** global block search link  

- **Not classified No restrictions**
### 1.7 Tool parameters

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Syntax</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INT</strong></td>
<td>$TC_DP1[32000,32000]$</td>
<td>When the 'flat D number management' function is active, the syntax is as follows: $TC_DP1[d]$</td>
</tr>
<tr>
<td><strong>DOUBLE</strong></td>
<td>$TC_DP2[32000,32000]$</td>
<td>When the 'flat D number management' function is active, the syntax is as follows: $TC_DP2[d]$</td>
</tr>
</tbody>
</table>

**Parameters:**
- **T number:** 1 - 32000
- **D number:** 1 - 32000

**Syntax Field Limits:**
- **T number:** 1 - 32000
- **D number:** 1 - 32000

**Access Rights:**
- **Read:** XX
- **Write:** XX 7
- **Attributes:** global block search link

**Not classified**
No restrictions
### Tool parameters

#### $TC_{DP3}[32000,32000]$  
**Description:**  
$TC_{DP3}[t,d]$  
Geometry - length 1  
When the 'flat D number management' function is active, the syntax is as follows: $TC_{DP3}[d]$  

**Field limits:**  
- **t:** T number 1 - 32000  
- **d:** Cutting edge number / D number 1 - 32000  

<table>
<thead>
<tr>
<th>Axis identifier</th>
<th>NCK version:</th>
<th>06.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit:</strong> mm</td>
<td><strong>min.:</strong> DBL_MIN</td>
<td><strong>max.:</strong> DBL_MAX</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin slp</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Attributes:</td>
<td>global</td>
<td>block search</td>
</tr>
<tr>
<td></td>
<td>Not classified</td>
<td>No restrictions</td>
</tr>
</tbody>
</table>

#### $TC_{DP4}[32000,32000]$  
**Description:**  
$TC_{DP4}[t,d]$  
Geometry - length 2  
When the 'flat D number management' function is active, the syntax is as follows: $TC_{DP4}[d]$  

**Field limits:**  
- **t:** T number 1 - 32000  
- **d:** Cutting edge number / D number 1 - 32000  

<table>
<thead>
<tr>
<th>Axis identifier</th>
<th>NCK version:</th>
<th>06.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit:</strong> mm</td>
<td><strong>min.:</strong> DBL_MIN</td>
<td><strong>max.:</strong> DBL_MAX</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin slp</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Attributes:</td>
<td>global</td>
<td>block search</td>
</tr>
<tr>
<td></td>
<td>Not classified</td>
<td>No restrictions</td>
</tr>
</tbody>
</table>
### Tool parameters

**DOUBLE $TC_DP5[32000,32000]$**

| description: |
| $TC_DP5[t,d]$ |
| Geometry - length 3 |
| When the 'flat D number management' function is active, the syntax is as follows: |
| $TC_DP5[d]$ |

**description of field limits:**
- t: T number 1 - 32000
- d: Cutting edge number / D number 1 - 32000

| axis identifier: |
| mm min.:: DBL_MIN |
| run-in main run runin slip Mrun syn PP SA OPI OEM access rights |
| read: X |
| write: X |

**attributes:**
- global
- block search
- nX

**Not classified**

**No restrictions**

**DOUBLE $TC_DP6[32000,32000]$**

| description: |
| $TC_DP6[t,d]$ |
| Geometry - radius |
| When the 'flat D number management' function is active, the syntax is as follows: |
| $TC_DP6[d]$ |

**description of field limits:**
- t: T number 1 - 32000
- d: Cutting edge number / D number 1 - 32000

| axis identifier: |
| mm min.:: DBL_MIN |
| run-in main run runin slip Mrun syn PP SA OPI OEM access rights |
| read: X |
| write: X |

**attributes:**
- global
- block search
- nX

**Not classified**

**No restrictions**
## 1.7 Tool parameters

### $TC_{DP7}[32000,32000]$ description:
$TC_{DP7}[t,d]$
Slotting saw: Corner radius
When the 'flat D number management' function is active, the syntax is as follows: $TC_{DP7}[d]$

description of field limits:
t: T number 1 - 32000
d: Cutting edge number / D number 1 - 32000

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>unit</th>
<th>min.:</th>
<th>NCK version:</th>
<th>max.:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>mm</td>
<td>DBL_MIN</td>
<td>06.00.00</td>
<td>DBL_MAX</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin slip</td>
<td>Mrun syn</td>
<td>PP</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td>X</td>
<td></td>
<td>7</td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
<td>sink</td>
<td>Not classified</td>
</tr>
</tbody>
</table>

### $TC_{DP8}[32000,32000]$ description:
$TC_{DP8}[t,d]$
Slotting saw: Length
When the 'flat D number management' function is active, the syntax is as follows: $TC_{DP8}[d]$

description of field limits:
t: T number 1 - 32000
d: Cutting edge number / D number 1 - 32000

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>unit</th>
<th>min.:</th>
<th>NCK version:</th>
<th>max.:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>mm</td>
<td>DBL_MIN</td>
<td>06.00.00</td>
<td>DBL_MAX</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin slip</td>
<td>Mrun syn</td>
<td>PP</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td>X</td>
<td></td>
<td>7</td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
<td>sink</td>
<td>Not classified</td>
</tr>
</tbody>
</table>
### 1.7 Tool parameters

#### $TC_{DP9}[32000,32000]$  
**Description:**

$TC_{DP9}[t,d]$

Reserved

When the "flat D number management" function is active, the syntax is as follows:

$TC_{DP9}[d]$

**Description of field limits:**

t: T number 1 - 32000  
d: Cutting edge number / D number 1 - 32000

<table>
<thead>
<tr>
<th>Axis identifier:</th>
<th>NCK version:</th>
</tr>
</thead>
<tbody>
<tr>
<td>mm</td>
<td>06.00.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit</th>
<th>min.:</th>
<th>DBL_MIN</th>
<th>max.:</th>
<th>DBL_MAX</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>main run</td>
<td>run-in stp</td>
<td>Mrun syn</td>
<td>PP</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Attributes:**

- global
- block search
- smk

Not classified  
No restrictions

#### $TC_{DP10}[32000,32000]$  
**Description:**

$TC_{DP10}[t,d]$

Angle between tool face and toroidal surface

When the "flat D number management" function is active, the syntax is as follows:

$TC_{DP10}[d]$

**Description of field limits:**

t: T number 1 - 32000  
d: Cutting edge number / D number 1 - 32000

<table>
<thead>
<tr>
<th>Axis identifier:</th>
<th>NCK version:</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>06.00.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit</th>
<th>min.:</th>
<th>DBL_MIN</th>
<th>max.:</th>
<th>DBL_MAX</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>main run</td>
<td>run-in stp</td>
<td>Mrun syn</td>
<td>PP</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Attributes:**

- global
- block search
- smk

Not classified  
No restrictions
### $TC\_DP11[32000,32000]$  
**Description:**

Angle between tool longitudinal axis and upper end of toroidal surface

When the ‘flat D number management’ function is active, the syntax is as follows: 

$TC\_DP11[d]$

**Description of Field Limits:**

- **t:** T number 1 - 32000
- **d:** Cutting edge number / D number 1 - 32000

**Axis Identifier:**

- **NCK version:** 06.00.00
- **Unit:** mm
- **Min.:** DBL_MIN
- **Max.:** DBL_MAX
- **Access Rights:**
  - **run-in:** X
  - **main run:** X
  - **run in stop:** X
  - **M run syn:** X
  - **PP:** X
  - **SA:** X
  - **OPT:** X
  - **OEM:** X

**Attributes:**

- **Global:** X
- **Block Search:** X
- **Link:** X

### $TC\_DP12[32000,32000]$  
**Description:**

Wear - length 1 - $TC\_DP3$

When the ‘flat D number management’ function is active, the syntax is as follows: 

$TC\_DP12[d]$

**Description of Field Limits:**

- **t:** T number 1 - 32000
- **d:** Cutting edge number / D number 1 - 32000

**Axis Identifier:**

- **NCK version:** 06.00.00
- **Unit:** mm
- **Min.:** DBL_MIN
- **Max.:** DBL_MAX
- **Access Rights:**
  - **run-in:** X
  - **main run:** X
  - **run in stop:** X
  - **M run syn:** X
  - **PP:** X
  - **SA:** X
  - **OPT:** X
  - **OEM:** X

**Attributes:**

- **Global:** X
- **Block Search:** X
- **Link:** X

Not classified  
No restrictions
**1 System variable**

1.7 Tool parameters

---

**DOUBLE $TC\_DP13[32000,32000]$**

<table>
<thead>
<tr>
<th>description:</th>
<th>$TC_DP13[t,d]$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wear - length 2 - $TC_DP4$</td>
<td></td>
</tr>
<tr>
<td>When the 'flat D number management' function is active, the syntax is as follows: $TC_DP13[d]$</td>
<td></td>
</tr>
</tbody>
</table>

**description of field limits:**

- **t**: T number 1 - 32000
- **d**: Cutting edge number / D number 1 - 32000

**axis identifier:**

- NCK version: 06.00.00
- unit: mm
- run-in: DBL_MIN
- main run: DBL_MAX
- runin slip: DBL_MIN
- Mrun syn: DBL_MAX
- PP: SA
- access rights: read: X
- write: X
- attributes: global block search

**Not classified No restrictions**

---

**DOUBLE $TC\_DP14[32000,32000]$**

<table>
<thead>
<tr>
<th>description:</th>
<th>$TC_DP14[t,d]$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wear - length 3 - $TC_DP5$</td>
<td></td>
</tr>
<tr>
<td>When the 'flat D number management' function is active, the syntax is as follows: $TC_DP14[d]$</td>
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**description of field limits:**

- **t**: T number 1 - 32000
- **d**: Cutting edge number / D number 1 - 32000

**axis identifier:**

- NCK version: 06.00.00
- unit: mm
- run-in: DBL_MIN
- main run: DBL_MAX
- runin slip: DBL_MIN
- Mrun syn: DBL_MAX
- PP: SA
- access rights: read: X
- write: X
- attributes: global block search

**Not classified No restrictions**
### $TC\_DP15[32000,32000]$  
**description:**  
$TC\_DP15[t,d]$  
Wear - radius - $TC\_DP6$  
When the 'flat D number management' function is active, the syntax is as follows:  
$TC\_DP15[d]$  
**description of field limits:**  
- **t:** T number 1 - 32000  
- **d:** Cutting edge number / D number 1 - 32000  

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>run-in</th>
<th>main run</th>
<th>runin slip</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>access rights</th>
<th>read</th>
<th>write</th>
<th>run</th>
<th>main run</th>
<th>runin slip</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
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<td>max.:</td>
<td>DBL_MAX</td>
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**attributes:**  
- global  
- block search  
- smk  
- Not classified  
- No restrictions

### $TC\_DP16[32000,32000]$  
**description:**  
$TC\_DP16[t,d]$  
Slotting saw: Wear - corner radius - $TC\_DP7$  
When the 'flat D number management' function is active, the syntax is as follows:  
$TC\_DP16[d]$  
**description of field limits:**  
- **t:** T number 1 - 32000  
- **d:** Cutting edge number / D number 1 - 32000  

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<th>main run</th>
<th>runin slip</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>access rights</th>
<th>read</th>
<th>write</th>
<th>run</th>
<th>main run</th>
<th>runin slip</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>access rights</th>
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**attributes:**  
- global  
- block search  
- smk  
- Not classified  
- No restrictions
1.7 Tool parameters

DOUBLE $TC_DP17[32000,32000]$  

description:
$TC_DP17[t,d]$
Slotting saw: Wear length - $TC_DP8$
When the 'flat D number management' function is active, the syntax is as follows:
$TC_DP17[d]$
description of field limits:
t: T number 1 - 32000
d: Cutting edge number / D number 1 - 32000

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<th>DBL_MIN</th>
<th>max.:</th>
<th>DBL_MAX</th>
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<th>main run</th>
<th>runin slop</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
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</table>

DOUBLE $TC_DP18[32000,32000]$  

description:
$TC_DP18[t,d]$
Wear - reserved - $TC_DP9$
When the 'flat D number management' function is active, the syntax is as follows:
$TC_DP18[d]$
description of field limits:
t: T number 1 - 32000
d: Cutting edge number / D number 1 - 32000

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<th>DBL_MIN</th>
<th>max.:</th>
<th>DBL_MAX</th>
<th>run-in</th>
<th>main run</th>
<th>runin slop</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
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<th>read:</th>
<th>write:</th>
<th>attributes:</th>
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</tbody>
</table>
### 1.7 Tool parameters

**DOUBLE $TC_DP19[32000,32000]$**

<table>
<thead>
<tr>
<th>Description:</th>
<th>$TC_DP19[t,d]$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wear - angle between tool face and toroidal surface - $TC_DP10$</td>
<td></td>
</tr>
<tr>
<td>When the 'flat D number management' function is active, the syntax is as follows: $TC_DP19[d]$</td>
<td></td>
</tr>
</tbody>
</table>

**Description of field limits:**

- **t**: T number 1 - 32000
- **d**: Cutting edge number / D number 1 - 32000

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<tr>
<th>Axis identifier:</th>
<th>NCK version:</th>
<th>06.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit:</td>
<td>min.: DBL_MIN</td>
<td>max.: DBL_MAX</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin slip</td>
</tr>
<tr>
<td>read: X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>write: X</td>
<td>X</td>
<td>7</td>
</tr>
<tr>
<td>Attributes: global</td>
<td>block search</td>
<td>xnk</td>
</tr>
<tr>
<td>run-in main run runin slip Mrun syn PP SA OPI OEM access rights</td>
<td></td>
<td></td>
</tr>
<tr>
<td>read: X X</td>
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<td>write: X X 7</td>
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<td>xnk</td>
</tr>
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<td></td>
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</table>

**DOUBLE $TC_DP20[32000,32000]$**

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<tr>
<th>Description:</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Wear - angle between tool longitudinal axis and upper end of toroidal surface - $TC_DP11$</td>
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</tr>
<tr>
<td>When the 'flat D number management' function is active, the syntax is as follows: $TC_DP20[d]$</td>
<td></td>
</tr>
</tbody>
</table>

**Description of field limits:**

- **t**: T number 1 - 32000
- **d**: Cutting edge number / D number 1 - 32000

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<th>Axis identifier:</th>
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<td>min.: DBL_MIN</td>
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</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin slip</td>
</tr>
<tr>
<td>read: X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>write: X</td>
<td>X</td>
<td>7</td>
</tr>
<tr>
<td>Attributes: global</td>
<td>block search</td>
<td>xnk</td>
</tr>
<tr>
<td>run-in main run runin slip Mrun syn PP SA OPI OEM access rights</td>
<td></td>
<td></td>
</tr>
<tr>
<td>read: X X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>write: X X 7</td>
<td></td>
<td></td>
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<tr>
<td>Attributes: global</td>
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</tr>
<tr>
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</tbody>
</table>
### Tool parameters

**$TC\_DP21[32000,32000]$**

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<th>Description:</th>
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</tr>
</thead>
<tbody>
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<tr>
<td>When the ‘flat D number management’ function is active, the syntax is as follows:</td>
<td></td>
</tr>
<tr>
<td>$TC_DP21[d]$</td>
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</table>

**Description of field limits:**

| t: T number 1 - 32000 | d: Cutting edge number / D number 1 - 32000 |

**Axis identifier:**

<table>
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<tr>
<th>NCK version:</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Unit: mm</td>
<td>[DBL_MIN \rightarrow DBL_MAX]</td>
</tr>
<tr>
<td>Run-in</td>
<td>[main run \rightarrow runin slp \rightarrow Mrun syn \rightarrow PP \rightarrow SA \rightarrow OPI \rightarrow OEM \rightarrow access rights]</td>
</tr>
<tr>
<td>Read:</td>
<td>XX</td>
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<tr>
<td>Write:</td>
<td>XX</td>
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**Attributes:**

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</tr>
</thead>
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<tr>
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<td>No restrictions</td>
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</tr>
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</table>

**$TC\_DP22[32000,32000]$**

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<thead>
<tr>
<th>Description:</th>
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</thead>
<tbody>
<tr>
<td>Basis - length 2</td>
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<td>$TC_DP22[d]$</td>
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**Description of field limits:**

| t: T number 1 - 32000 | d: Cutting edge number / D number 1 - 32000 |

**Axis identifier:**

<table>
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</thead>
<tbody>
<tr>
<td>Unit: mm</td>
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</tr>
<tr>
<td>Run-in</td>
<td>[main run \rightarrow runin slp \rightarrow Mrun syn \rightarrow PP \rightarrow SA \rightarrow OPI \rightarrow OEM \rightarrow access rights]</td>
</tr>
<tr>
<td>Read:</td>
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<td>Write:</td>
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**Attributes:**

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<td>No restrictions</td>
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### TOOL PARAMETERS

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<th>Description</th>
<th>Field Limits</th>
<th>Unit</th>
<th>Min.</th>
<th>Max.</th>
<th>Access Rights</th>
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<td>Basis - length 3</td>
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<td>$\text{TC_DP23}[d]$</td>
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<td>description of field limits:</td>
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<td>$t$: T number 1 - 32000</td>
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<tr>
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<td>$d$: Cutting edge number / D number 1 - 32000</td>
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<td>run-in main run runin slip Mrun syn PP SA OPT OEM</td>
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<tr>
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<th>Field Limits</th>
<th>Unit</th>
<th>Min.</th>
<th>Max.</th>
<th>Access Rights</th>
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<tr>
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<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>$t$: T number 1 - 32000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$d$: Cutting edge number / D number 1 - 32000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>axis identifier:</td>
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<td></td>
<td>NCK version: 06.00.00</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>unit:</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>run-in main run runin slip Mrun syn PP SA OPT OEM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>read:</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>write:</td>
<td>X</td>
<td>X</td>
<td>7</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>attributes:</td>
<td>global block search</td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Not classified</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### $TC_DP25[32000,32000]$

**Description:**
$TC_DP25[t,d]$  
Reserved  
When the 'flat D number management' function is active, the syntax is as follows: $TC_DP25[d]$  

**Description of Field Limits:**
- **t:** T number 1 - 32000  
- **d:** Cutting edge number / D number 1 - 32000

**Axis Identifier:**
- NCK version: 06.00.00

<table>
<thead>
<tr>
<th>unit</th>
<th>min.</th>
<th>max.</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin stp</td>
<td>Mrun syn</td>
</tr>
<tr>
<td>-</td>
<td>DBL_MIN</td>
<td>DBL_MAX</td>
<td></td>
</tr>
</tbody>
</table>

**Attributes:**
- global  
- block search  
- link

**Not classified**  
**No restrictions**

### $TC_DPCE[32000,32000]$

**Description:**
$TC_DPCE[t,d] = 'cutting edge number' of compensation data block t,d$  
When the 'flat D number management' function is active, the syntax is as follows: $TC_DPCE[d]$  

**CE stands for <C>utting<E>dge**

**Value range of legal 'cutting edge numbers':**
1 up to value of machine data $MN_MM_MAX_CUTTING_EDGE_PERTOOL$.

**Description of Field Limits:**
- **t:** T number 1 - 32000  
- **d:** Cutting edge number / D number 1 - 32000

**Axis Identifier:**
- NCK version: 16.00.00

<table>
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<th>access rights</th>
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<tr>
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<td>main run</td>
<td>runin stp</td>
<td>Mrun syn</td>
</tr>
<tr>
<td>-</td>
<td>INT_MIN</td>
<td>INT_MAX</td>
<td></td>
</tr>
</tbody>
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**Attributes:**
- global  
- block search  
- link

**Not classified**  
**No restrictions**
### System variable

#### 1.7 Tool parameters

<table>
<thead>
<tr>
<th>IN1</th>
<th>$TC_DPH[32000,32000]$</th>
<th>description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>description:</td>
<td>$TC_DPH[t.d] = \text{`H cutting edge number'}$ of compensation data block $t,d$ for Fanuc0 M</td>
<td></td>
</tr>
<tr>
<td>When the `flat D number management' function is active, the syntax is as follows:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$TC_DPH[d]$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>An alarm is issued if this variable is used with the function <code>ISO2.1 mode' or </code>ISO3.1 mode' inactive.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>description of field limits:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>t: T number 1 - 32000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d: Cutting edge number / D number 1 - 32000</td>
<td></td>
<td></td>
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<tr>
<td>axis identifier:</td>
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<tr>
<td>NCK version: 17.00.00</td>
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<td></td>
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<tr>
<td>unit:</td>
<td></td>
<td></td>
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<tr>
<td>run-in</td>
<td>main run</td>
<td>runin stp</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
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<tr>
<td>attributes:</td>
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<td>block search</td>
</tr>
<tr>
<td>Not classified</td>
<td>No restrictions</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IN1</th>
<th>$TC_DPV[32000,32000]$</th>
<th>description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>description:</td>
<td>$TC_DPV[t,d] = \text{tool cutting edge orientation}$</td>
<td></td>
</tr>
<tr>
<td>When the `flat D number management' function is active, the syntax is as follows:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$TC_DPV[d]$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>description of field limits:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>t: T number 1 - 32000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d: Cutting edge number / D number 1 - 32000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>axis identifier:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NCK version: 43.00.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>unit:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin stp</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
</tr>
<tr>
<td>Not classified</td>
<td>No restrictions</td>
<td></td>
</tr>
</tbody>
</table>
## 1.7 Tool parameters

### $TC_DPV3[32000,32000]$  
**Description:**  
$TC_DPV3[t,d] = L1$ component of tool cutting edge orientation  
When the 'flat D number management' function is active, the syntax is as follows:  
$TC_DPV3[d]$  

<table>
<thead>
<tr>
<th>Field</th>
<th>Limit</th>
<th>Axis Identifier</th>
<th>NCK Version</th>
<th>Access Rights</th>
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<tbody>
<tr>
<td>t</td>
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<td>T number</td>
<td>43.00.00</td>
<td>XXX</td>
</tr>
<tr>
<td>d</td>
<td>1 - 32000</td>
<td>Cutting edge number / D number</td>
<td></td>
<td></td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Unit</th>
<th>Min.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>t</td>
<td>DBL_MIN</td>
<td>DBL_MAX</td>
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</table>

<table>
<thead>
<tr>
<th>Read</th>
<th>Write</th>
<th>Attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
<td>global, block search, link</td>
</tr>
</tbody>
</table>

### $TC_DPV4[32000,32000]$  
**Description:**  
$TC_DPV4[t,d] = L2$ component of tool cutting edge orientation  
When the 'flat D number management' function is active, the syntax is as follows:  
$TC_DPV4[d]$  

<table>
<thead>
<tr>
<th>Field</th>
<th>Limit</th>
<th>Axis Identifier</th>
<th>NCK Version</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>t</td>
<td>1 - 32000</td>
<td>T number</td>
<td>43.00.00</td>
<td>XXX</td>
</tr>
<tr>
<td>d</td>
<td>1 - 32000</td>
<td>Cutting edge number / D number</td>
<td></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit</th>
<th>Min.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>t</td>
<td>DBL_MIN</td>
<td>DBL_MAX</td>
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</table>

<table>
<thead>
<tr>
<th>Read</th>
<th>Write</th>
<th>Attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
<td>global, block search, link</td>
</tr>
</tbody>
</table>

Not classified No restrictions
### DOUBLE $TC_DPV5[32000,32000]$

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$TC_DPV5[t,d] = L3 component of tool cutting edge orientation</td>
</tr>
<tr>
<td>When the 'flat D number management' function is active, the syntax is as follows: $TC_DPV5[d] $</td>
</tr>
<tr>
<td>Description of field limits:</td>
</tr>
<tr>
<td>t: T number 1 - 32000</td>
</tr>
<tr>
<td>d: Cutting edge number / D number 1 - 32000</td>
</tr>
<tr>
<td>Axis identifier:</td>
</tr>
<tr>
<td>NCK version: 43.00.00</td>
</tr>
<tr>
<td>Unit: -</td>
</tr>
<tr>
<td>run-in main run runin slip Mrun syn PP SA OPT OEM access rights</td>
</tr>
<tr>
<td>read: X</td>
</tr>
<tr>
<td>write: X</td>
</tr>
<tr>
<td>attributes: global block search link</td>
</tr>
<tr>
<td>Not classified No restrictions</td>
</tr>
</tbody>
</table>

### DOUBLE $TC_DPVN3[32000,32000]$

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$TC_DPVN3[t,d] = L1 component of the orientation normal of the tool cutting edge.</td>
</tr>
<tr>
<td>If the function 'flat D-number management' is active, the syntax is as follows: $TC_DPVN3[d] $</td>
</tr>
<tr>
<td>Description of field limits:</td>
</tr>
<tr>
<td>t: T number 1 - 32000</td>
</tr>
<tr>
<td>d: Tool cutting edge number / D number 1 - 32000</td>
</tr>
<tr>
<td>Axis identifier:</td>
</tr>
<tr>
<td>NCK version: 58.00.00</td>
</tr>
<tr>
<td>Unit: -</td>
</tr>
<tr>
<td>run-in main run runin slip Mrun syn PP SA OPT OEM access rights</td>
</tr>
<tr>
<td>read: X</td>
</tr>
<tr>
<td>write: X</td>
</tr>
<tr>
<td>attributes: global block search link</td>
</tr>
<tr>
<td>Not classified No restrictions</td>
</tr>
</tbody>
</table>
### 1.7 Tool parameters

#### DOUBLE $\text{TC\_DPVN4}[32000,32000]$

<table>
<thead>
<tr>
<th>Description:</th>
<th>$\text{TC_DPVN4}[t,d] = L2 \text{ component of the orientation normal of the tool cutting edge.}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>If the function 'flat D-number management' is active, the syntax is as follows:</td>
<td>$\text{TC_DPVN4}[d]$</td>
</tr>
</tbody>
</table>
| Description of field limits: | $t$: T number 1 - 32000  
   $d$: tool cutting edge number / D number 1 - 32000 |
| Axis identifier: | NCK version: 58.00.00 |
| Unit: | min.: DBL\_MIN  
   max.: DBL\_MAX |
| Run-in main run run-in slp Mrun syn PP SA OPT OEM access rights | read: X  
   write: X |
| Attributes: | global block search link |

#### DOUBLE $\text{TC\_DPVN5}[32000,32000]$

<table>
<thead>
<tr>
<th>Description:</th>
<th>$\text{TC_DPVN5}[t,d] = L3 \text{ component of the orientation normal of the tool cutting edge.}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>If the function 'flat D-number management' is active, the syntax is as follows:</td>
<td>$\text{TC_DPVN5}[d]$</td>
</tr>
</tbody>
</table>
| Description of field limits: | $t$: T number 1 - 32000  
   $d$: tool cutting edge number / D number 1 - 32000 |
| Axis identifier: | NCK version: 58.00.00 |
| Unit: | min.: DBL\_MIN  
   max.: DBL\_MAX |
| Run-in main run run-in slp Mrun syn PP SA OPT OEM access rights | read: X  
   write: X |
| Attributes: | global block search link |

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SINUMERIK 840D sl/840Di sl/ 840D/ 840Di, List of System Variables (PGA1), 01/2008
## 1.8 Cutting edge data for OEM users

### DOUBLE $TC_DPC1[32000,32000]$  

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>The type can be specified by machine data. DOUBLE is the default setting $TC_DPC1[t,d]$</td>
</tr>
</tbody>
</table>

When the ‘flat D number management’ function is active, the syntax is as follows: $TC_DPC1[d]$

<table>
<thead>
<tr>
<th>Description of field limits:</th>
</tr>
</thead>
</table>
| t: T number 1 - 32000  
| d: Cutting edge number / D number 1 - 32000  

| Axis identifier | NCK version:  
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<tr>
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<table>
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<th>Unit</th>
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<th>max.: DBL_MAX</th>
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</thead>
<tbody>
<tr>
<td>run-in</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>main run</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>runin stp</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Mrun syn</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>PP</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>SA</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>OPI</td>
<td>X</td>
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<td>X</td>
</tr>
<tr>
<td>access rights</td>
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</table>

| Read | write: XX 7  
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<tr>
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<table>
<thead>
<tr>
<th>Attributes</th>
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</tbody>
</table>

### DOUBLE $TC_DPC2[32000,32000]$  

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<tr>
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</tr>
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</table>

When the ‘flat D number management’ function is active, the syntax is as follows: $TC_DPC2[d]$

<table>
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<tr>
<th>Description of field limits:</th>
</tr>
</thead>
</table>
| t: T number 1 - 32000  
| d: Cutting edge number / D number 1 - 32000  

| Axis identifier | NCK version:  
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<th></th>
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<td>X</td>
</tr>
<tr>
<td>main run</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>runin stp</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Mrun syn</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>PP</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>SA</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>OPI</td>
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</tr>
<tr>
<td>access rights</td>
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| Read | write: XX 7  
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<tbody>
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<tr>
<th>Attributes</th>
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</table>
### $TC_DPC3[32000,32000]$

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<tbody>
<tr>
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</tbody>
</table>

When the "flat D number management" function is active, the syntax is as follows: $TC_DPC3[t,d]$

<table>
<thead>
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</tr>
</thead>
<tbody>
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</tr>
<tr>
<td>d: Cutting edge number / D number 1 - 32000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>axis identifier:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>NCK version: 06.00.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>unit:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
</tr>
<tr>
<td>main run</td>
</tr>
<tr>
<td>runin sip</td>
</tr>
<tr>
<td>Mrun syn</td>
</tr>
<tr>
<td>PP</td>
</tr>
<tr>
<td>SA</td>
</tr>
<tr>
<td>OPI</td>
</tr>
<tr>
<td>OEM</td>
</tr>
<tr>
<td>access rights</td>
</tr>
<tr>
<td>read:</td>
</tr>
<tr>
<td>write:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>attributes:</strong></th>
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<tbody>
<tr>
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### $TC_DPC4[32000,32000]$

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</thead>
<tbody>
<tr>
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</tbody>
</table>

When the "flat D number management" function is active, the syntax is as follows: $TC_DPC4[t,d]$

<table>
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<tr>
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</tr>
</thead>
<tbody>
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</tr>
<tr>
<td>d: Cutting edge number / D number 1 - 32000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>axis identifier:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>NCK version: 06.00.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>unit:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
</tr>
<tr>
<td>main run</td>
</tr>
<tr>
<td>runin sip</td>
</tr>
<tr>
<td>Mrun syn</td>
</tr>
<tr>
<td>PP</td>
</tr>
<tr>
<td>SA</td>
</tr>
<tr>
<td>OPI</td>
</tr>
<tr>
<td>OEM</td>
</tr>
<tr>
<td>access rights</td>
</tr>
<tr>
<td>read:</td>
</tr>
<tr>
<td>write:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>attributes:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>global block search</td>
</tr>
</tbody>
</table>

© Siemens AG 2008 All Rights Reserved
SINUMERIK 840D sl/840Di sl/ 840D/ 840Di, List of System Variables (PGA1), 01/2008
### DOUBLE $TC_DPC5[32000,32000]$

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>The type can be specified by machine data. DOUBLE is the default setting.</td>
</tr>
</tbody>
</table>

When the "flat D number management" function is active, the syntax is as follows:

$TC_DPC5[t,d]$

<table>
<thead>
<tr>
<th>Description of field limits:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>t</strong>: T number 1 - 32000</td>
</tr>
<tr>
<td><strong>d</strong>: Cutting edge number / D number 1 - 32000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Axis identifier:</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCK version: 06.00.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min.: DBL_MIN</td>
</tr>
<tr>
<td>Max.: DBL_MAX</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rights run-in</th>
<th>main run</th>
<th>runin slip</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>access</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Read:</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Write:</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Attributes:</th>
</tr>
</thead>
<tbody>
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</tr>
</tbody>
</table>

No restrictions

### DOUBLE $TC_DPC6[32000,32000]$

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<tbody>
<tr>
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</table>

When the "flat D number management" function is active, the syntax is as follows:

$TC_DPC6[t,d]$

<table>
<thead>
<tr>
<th>Description of field limits:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>t</strong>: T number 1 - 32000</td>
</tr>
<tr>
<td><strong>d</strong>: Cutting edge number / D number 1 - 32000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Axis identifier:</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCK version: 06.00.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min.: DBL_MIN</td>
</tr>
<tr>
<td>Max.: DBL_MAX</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rights run-in</th>
<th>main run</th>
<th>runin slip</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>access</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Read:</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Write:</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Attributes:</th>
</tr>
</thead>
<tbody>
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No restrictions
### DOUBLE $TC_DPC7[32000,32000]$

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<tbody>
<tr>
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<tr>
<td>When the 'flat D number management' function is active, the syntax is as follows:</td>
</tr>
<tr>
<td>$TC_DPC7[t,d]$</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>t: T number 1 - 32000</td>
</tr>
<tr>
<td>d: Cutting edge number / D number 1 - 32000</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Axis identifier:</th>
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</thead>
<tbody>
<tr>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit:</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
</tr>
<tr>
<td>main run</td>
</tr>
<tr>
<td>runin slip</td>
</tr>
<tr>
<td>Mrun syn</td>
</tr>
<tr>
<td>PP</td>
</tr>
<tr>
<td>SA</td>
</tr>
<tr>
<td>OPT</td>
</tr>
<tr>
<td>OEM</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>access run runin stp Mrun syn syn PP SA OPT OEM access rights</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Read:</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
</tr>
<tr>
<td>X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Write:</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
</tr>
<tr>
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</tbody>
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<table>
<thead>
<tr>
<th>Attributes:</th>
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<tbody>
<tr>
<td>global block search skm</td>
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</tbody>
</table>

Not classified No restrictions

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### DOUBLE $TC_DPC8[32000,32000]$

<table>
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<tbody>
<tr>
<td>The type can be specified by machine data. DOUBLE is the default setting</td>
</tr>
<tr>
<td>When the 'flat D number management' function is active, the syntax is as follows:</td>
</tr>
<tr>
<td>$TC_DPC8[t,d]$</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description of field limits:</th>
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<tbody>
<tr>
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<tr>
<td>d: Cutting edge number / D number 1 - 32000</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Axis identifier:</th>
</tr>
</thead>
<tbody>
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<td>NCK version: 06.00.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit:</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
</tr>
<tr>
<td>main run</td>
</tr>
<tr>
<td>runin slip</td>
</tr>
<tr>
<td>Mrun syn</td>
</tr>
<tr>
<td>PP</td>
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<tr>
<td>SA</td>
</tr>
<tr>
<td>OPT</td>
</tr>
<tr>
<td>OEM</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Accessibility rights:</th>
</tr>
</thead>
<tbody>
<tr>
<td>access run runin stp Mrun syn syn PP SA OPT OEM access rights</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Read:</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
</tr>
<tr>
<td>X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Write:</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
</tr>
<tr>
<td>7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Attributes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>global block search skm</td>
</tr>
</tbody>
</table>

Not classified No restrictions

---
### $TC_DPC9[32000,32000]$

**Description:**
The type can be specified by machine data. DOUBLE is the default setting
$TC_DPC9[t,d]$  
When the 'flat D number management' function is active, the syntax is as follows:  
$TC_DPC9[d]$  

**Description of field limits:**
- **t:** T number 1 - 32000  
- **d:** Cutting edge number / D number 1 - 32000

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>min.</th>
<th>max.</th>
<th>Unit</th>
<th>run-in</th>
<th>main run</th>
<th>runin sip</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Read</th>
<th>Write</th>
<th>Attributes</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
<td>global, block search</td>
<td>X</td>
</tr>
</tbody>
</table>

**Not classified**  
No restrictions

### $TC_DPC10[32000,32000]$

**Description:**
The type can be specified by machine data. DOUBLE is the default setting
$TC_DPC10[t,d]$  
When the 'flat D number management' function is active, the syntax is as follows:  
$TC_DPC10[d]$  

**Description of field limits:**
- **t:** T number 1 - 32000  
- **d:** Cutting edge number / D number 1 - 32000

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>min.</th>
<th>max.</th>
<th>Unit</th>
<th>run-in</th>
<th>main run</th>
<th>runin sip</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></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>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Read</th>
<th>Write</th>
<th>Attributes</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
<td>global, block search</td>
<td>X</td>
</tr>
</tbody>
</table>

**Not classified**  
No restrictions
### DOUBLE $TC_DPCS1[32000,32000]$  
**description:**  
The type can be specified by machine data. DOUBLE is the default setting.  
$TC_DPCS1[t,d]$  
When the 'flat D number management' function is active, the syntax is as follows:  
$TC_DPCS1[d]$  

**description of field limits:**  
- **t:** T number 1 - 32000  
- **d:** Cutting edge number / D number 1 - 32000

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>NCK version:</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>main run</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
</tr>
</tbody>
</table>

**attributes:** global block search sink  
Not classified No restrictions

### DOUBLE $TC_DPCS2[32000,32000]$  
**description:**  
The type can be specified by machine data. DOUBLE is the default setting.  
$TC_DPCS2[t,d]$  
When the 'flat D number management' function is active, the syntax is as follows:  
$TC_DPCS2[d]$  

**description of field limits:**  
- **t:** T number 1 - 32000  
- **d:** Cutting edge number / D number 1 - 32000

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>NCK version:</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>main run</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
</tr>
</tbody>
</table>

**attributes:** global block search sink  
Not classified No restrictions
### $TC_DPCS3[32000,32000]$

**Description:**

The type can be specified by machine data. DOUBLE is the default setting.

When the 'flat D number management' function is active, the syntax is as follows:

$TC_DPCS3[t,d]$

**Description of field limits:**

- **t**: T number 1 - 32000
- **d**: Cutting edge number / D number 1 - 32000

**Axis identifier:**

- **NCK version**: 18.00.00

**Unit:**

- **min.**: DBL_MIN
- **max.**: DBL_MAX

**Read:**

- **run-in**: X
- **main run**: X
- **runin stp**: X
- **Mrun syn**: X
- **PP**: X
- **SA**: X
- **OPI**: X
- **OEM**: X
- **Access rights**: X

**Write:**

- **run-in**: X
- **main run**: X
- **runin stp**: X
- **Mrun syn**: X
- **PP**: X
- **SA**: X
- **OPI**: X
- **OEM**: X
- **Access rights**: X

**Attributes:**

- **global**: block search
- **sink**: not classified
- **No restrictions**

### $TC_DPCS4[32000,32000]$

**Description:**

The type can be specified by machine data. DOUBLE is the default setting.

When the 'flat D number management' function is active, the syntax is as follows:

$TC_DPCS4[t,d]$

**Description of field limits:**

- **t**: T number 1 - 32000
- **d**: Cutting edge number / D number 1 - 32000

**Axis identifier:**

- **NCK version**: 18.00.00

**Unit:**

- **min.**: DBL_MIN
- **max.**: DBL_MAX

**Read:**

- **run-in**: X
- **main run**: X
- **runin stp**: X
- **Mrun syn**: X
- **PP**: X
- **SA**: X
- **OPI**: X
- **OEM**: X
- **Access rights**: X

**Write:**

- **run-in**: X
- **main run**: X
- **runin stp**: X
- **Mrun syn**: X
- **PP**: X
- **SA**: X
- **OPI**: X
- **OEM**: X
- **Access rights**: X

**Attributes:**

- **global**: block search
- **sink**: not classified
- **No restrictions**
### 1.8 Cutting edge data for OEM users

**DOUBLE $TC_DPCS5[32000,32000]$**

<table>
<thead>
<tr>
<th>Description:</th>
<th>The type can be specified by machine data. DOUBLE is the default setting. $TC_DPCS5[t,d]$ When the 'flat D number management' function is active, the syntax is as follows: $TC_DPCS5[d]$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Syntax:</td>
<td>$TC_DPCS5[t,d]$</td>
</tr>
</tbody>
</table>
| Field limits:| $t$: T number 1 - 32000  
             | $d$: Cutting edge number / D number 1 - 32000                                                   |
| Axis identifier: | NCK version: 18.00.00  
                | Unit: - min.: DBL_MIN max.: DBL_MAX |
| Run-in:      | run-in | main run | runin slip | Mrun syn | PP | SA | OPI | OEM | access rights |
| Read:        | X      | X        |            |         |    |    |     |     |               |
| Write:       | X      | X        |            |         |    |    |     |     | 7               |
| Attributes:  | global | block search | smk |         | Not classified | No restrictions |

**DOUBLE $TC_DPCS6[32000,32000]$**

<table>
<thead>
<tr>
<th>Description:</th>
<th>The type can be specified by machine data. DOUBLE is the default setting. $TC_DPCS6[t,d]$ When the 'flat D number management' function is active, the syntax is as follows: $TC_DPCS6[d]$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Syntax:</td>
<td>$TC_DPCS6[t,d]$</td>
</tr>
</tbody>
</table>
| Field limits:| $t$: T number 1 - 32000  
             | $d$: Cutting edge number / D number 1 - 32000                                                   |
| Axis identifier: | NCK version: 18.00.00  
                | Unit: - min.: DBL_MIN max.: DBL_MAX |
| Run-in:      | run-in | main run | runin slip | Mrun syn | PP | SA | OPI | OEM | access rights |
| Read:        | X      | X        |            |         |    |    |     |     |               |
| Write:       | X      | X        |            |         |    |    |     |     | 7               |
| Attributes:  | global | block search | smk |         | Not classified | No restrictions |
### DOUBLE $TC_DPCS7[32000,32000]$

**Description:**
The type can be specified by machine data. **DOUBLE** is the default setting.

When the 'flat D number management' function is active, the syntax is as follows:

$TC_DPCS7[t,d]$

**Description of Field Limits:**
- **t:** T number 1 - 32000
- **d:** Cutting edge number / D number 1 - 32000

<table>
<thead>
<tr>
<th>T</th>
<th>1 - 32000</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>1 - 32000</td>
</tr>
</tbody>
</table>

**Axis Identifier:**
- NCK version: 18.00.00

<table>
<thead>
<tr>
<th>Run-in</th>
<th>Main Run</th>
<th>Runin Slip</th>
<th>Mrun Syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

**Read:**
- XX

**Write:**
- XX

**Attributes:**
- Global
- Block Search
- Link
- Not classified
- No restrictions

### DOUBLE $TC_DPCS8[32000,32000]$

**Description:**
The type can be specified by machine data. **DOUBLE** is the default setting.

When the 'flat D number management' function is active, the syntax is as follows:

$TC_DPCS8[t,d]$

**Description of Field Limits:**
- **t:** T number 1 - 32000
- **d:** Cutting edge number / D number 1 - 32000

<table>
<thead>
<tr>
<th>T</th>
<th>1 - 32000</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>1 - 32000</td>
</tr>
</tbody>
</table>

**Axis Identifier:**
- NCK version: 18.00.00

<table>
<thead>
<tr>
<th>Run-in</th>
<th>Main Run</th>
<th>Runin Slip</th>
<th>Mrun Syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

**Read:**
- XX

**Write:**
- XX

**Attributes:**
- Global
- Block Search
- Link
- Not classified
- No restrictions
### $\text{DOUBLE } TC\_DPCS9[32000,32000]$  

**description:**  
The type can be specified by machine data. DOUBLE is the default setting  

$TC\_DPCS9[t,d]$  
When the ‘flat D number management’ function is active, the syntax is as follows:  

$TC\_DPCS9[d]$  

**description of field limits:**  
$t$: T number 1 - 32000  
$d$: Cutting edge number / D number 1 - 32000  

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>min.:</th>
<th>max.:</th>
<th>NCK version:</th>
<th>18.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit: run-in</td>
<td>main run</td>
<td>runin slip</td>
<td>Mrun syn</td>
<td>PP</td>
</tr>
<tr>
<td>read: X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>write: X</td>
<td>X</td>
<td></td>
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<td>7</td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
<td>sink</td>
<td></td>
</tr>
</tbody>
</table>

### $\text{DOUBLE } TC\_DPCS10[32000,32000]$  

**description:**  
The type can be specified by machine data. DOUBLE is the default setting  

$TC\_DPCS10[t,d]$  
When the ‘flat D number management’ function is active, the syntax is as follows:  

$TC\_DPCS10[d]$  

**description of field limits:**  
$t$: T number 1 - 32000  
$d$: Cutting edge number / D number 1 - 32000  

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>min.:</th>
<th>max.:</th>
<th>NCK version:</th>
<th>18.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit: run-in</td>
<td>main run</td>
<td>runin slip</td>
<td>Mrun syn</td>
<td>PP</td>
</tr>
<tr>
<td>read: X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>write: X</td>
<td>X</td>
<td></td>
<td></td>
<td>7</td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
<td>sink</td>
<td></td>
</tr>
</tbody>
</table>

Not classified  
No restrictions
### $TC\_SCP13[32000,32000]$

**Description:**
Offset for $TC\_DP3$: $TC\_SCP13[t,d]$ comparable to $TC\_DP12[t,d]$

When the 'flat D number management' function is active, the syntax is as follows: $TC\_SCP13[d]$

**Description of field limits:**
- **t:** T number 1 - 32000
- **d:** Cutting edge number / D number 1 - 32000

**Axis identifier:**
- **NCK version:** 15.00.00
- **Unit:** mm
- **Min.:** DBL\_MIN
- **Max.:** DBL\_MAX
- **Run-in:** main run
- **Run-in slip:** Mrun syn
- **PP:**
- **SA:**
- **OPT:**
- **OEM:**
- **Access rights:**
- **Read:** X
- **Write:** X

**Attributes:**
- **Global:**
- **Block search:**
- **Link:**

| Not classified | No restrictions |

### $TC\_SCP14[32000,32000]$

**Description:**
Offset for $TC\_DP4$: $TC\_SCP14[t,d]$ comparable to $TC\_DP13[t,d]$

When the 'flat D number management' function is active, the syntax is as follows: $TC\_SCP14[d]$

**Description of field limits:**
- **t:** T number 1 - 32000
- **d:** Cutting edge number / D number 1 - 32000

**Axis identifier:**
- **NCK version:** 15.00.00
- **Unit:** mm
- **Min.:** DBL\_MIN
- **Max.:** DBL\_MAX
- **Run-in:** main run
- **Run-in slip:** Mrun syn
- **PP:**
- **SA:**
- **OPT:**
- **OEM:**
- **Access rights:**
- **Read:** X
- **Write:** X

**Attributes:**
- **Global:**
- **Block search:**
- **Link:**

| Not classified | No restrictions |
**DOUBLE $TC_SCP15[32000,32000]$**

**description:**
Offset for $TC_DP5$: $TC_SCP15[t,d]$ comparable to $TC_DP14[t,d]$
When the 'flat D number management' function is active, the syntax is as follows:
$TC_SCP15[d]$

**description of field limits:**
- **t:** T number 1 - 32000
- **d:** Cutting edge number / D number 1 - 32000

**axis identifier:**

<table>
<thead>
<tr>
<th>run-in</th>
<th>main run</th>
<th>runin slp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>read:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**attributes:**
- global
- block search
- link

**Not classified No restrictions**

**DOUBLE $TC_SCP16[32000,32000]$**

**description:**
Offset for $TC_DP6$: $TC_SCP16[t,d]$ comparable to $TC_DP15[t,d]$
When the 'flat D number management' function is active, the syntax is as follows:
$TC_SCP16[d]$

**description of field limits:**
- **t:** T number 1 - 32000
- **d:** Cutting edge number / D number 1 - 32000

**axis identifier:**

<table>
<thead>
<tr>
<th>run-in</th>
<th>main run</th>
<th>runin slp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>read:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

**attributes:**
- global
- block search
- link

**Not classified No restrictions**
### $TC_SCP17[32000,32000]$

**Description:**
Offset for $TC_DP7$: $TC_SCP17[t,d]$ comparable to $TC_DP16[t,d]$

When the 'flat D number management' function is active, the syntax is as follows:
$TC_SCP17[d]$

**Description of field limits:**
- **t:** T number 1 - 32000
- **d:** Cutting edge number / D number 1 - 32000

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
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<td>DBL_MIN</td>
<td>DBL_MAX</td>
</tr>
<tr>
<td>main run</td>
<td></td>
<td></td>
</tr>
<tr>
<td>main slp</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M run syn</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OPT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OEM</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Access rights:**
- **read:** X
- **write:** XX 7

**Attributes:**
- global
- block search
- link

---

### $TC_SCP18[32000,32000]$

**Description:**
Offset for $TC_DP8$: $TC_SCP18[t,d]$ comparable to $TC_DP17[t,d]$

When the 'flat D number management' function is active, the syntax is as follows:
$TC_SCP18[d]$

**Description of field limits:**
- **t:** T number 1 - 32000
- **d:** Cutting edge number / D number 1 - 32000

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
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<td>DBL_MAX</td>
</tr>
<tr>
<td>main run</td>
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<tr>
<td>main slp</td>
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</tr>
<tr>
<td>M run syn</td>
<td></td>
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<tr>
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</tr>
<tr>
<td>SA</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>OEM</td>
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</tr>
</tbody>
</table>

**Access rights:**
- **read:** X
- **write:** X 7

**Attributes:**
- global
- block search
- link

---
### DOUBLE \$TC_SCP19\[32000,32000\]

**description:**
Offset for \$TC_DP9: \$TC_SCP19\[t,d]\ comparable to \$TC_DP18\[t,d]\[d]
When the 'flat D number management' function is active, the syntax is as follows: \$TC_SCP19\[d]

**description of field limits:**
- **t:** T number 1 - 32000
- **d:** Cutting edge number / D number 1 - 32000

**axis identifier:**

<table>
<thead>
<tr>
<th>unit</th>
<th>run-in</th>
<th>main run</th>
<th>runin slip</th>
<th>Mrun syn</th>
<th>PP</th>
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<th>OPT</th>
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</tr>
</thead>
<tbody>
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</tr>
</tbody>
</table>

**read:** X
**write:** X
**attributes:** global block search

Not classified No restrictions

### DOUBLE \$TC_SCP20\[32000,32000\]

**description:**
Offset for \$TC_DP10: \$TC_SCP20\[t,d]\ comparable to \$TC_DP19\[t,d]\[d]
When the 'flat D number management' function is active, the syntax is as follows: \$TC_SCP20\[d]

**description of field limits:**
- **t:** T number 1 - 32000
- **d:** Cutting edge number / D number 1 - 32000

**axis identifier:**

<table>
<thead>
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<th>run-in</th>
<th>main run</th>
<th>runin slip</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<td>min.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
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<td></td>
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<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**read:** X
**write:** X
**attributes:** global block search

Not classified No restrictions
### DOUBLE \$TC_SCP21[32000,32000]

**Description:**
Offset for \$TC_DP11: \$TC_SCP21[t,d] comparable to \$TC_DP20[t,d]
When the 'flat D number management' function is active, the syntax is as follows:
\$TC_SCP21[d]

**Description of Field Limits:**
t: T number 1 - 32000
d: Cutting edge number / D number 1 - 32000

<table>
<thead>
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<th>Axis Identifier</th>
<th>NCK Version</th>
<th>Unit</th>
<th>Min.</th>
<th>Max.</th>
<th>Run-in</th>
<th>Main Run</th>
<th>Runin Slip</th>
<th>Mrun Syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
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<td>DBL_MAX</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Read</td>
<td>X</td>
<td>X</td>
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<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Write</td>
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<td></td>
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<tr>
<td>Attributes</td>
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<td>Block Search</td>
<td>Link</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

### DOUBLE \$TC_SCP23[32000,32000]

**Description:**
Offset for \$TC_DP3: \$TC_SCP23[t,d] comparable to \$TC_DP12[t,d]
When the 'flat D number management' function is active, the syntax is as follows:
\$TC_SCP23[d]

**Description of Field Limits:**
t: T number 1 - 32000
d: Cutting edge number / D number 1 - 32000

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>NCK Version</th>
<th>Unit</th>
<th>Min.</th>
<th>Max.</th>
<th>Run-in</th>
<th>Main Run</th>
<th>Runin Slip</th>
<th>Mrun Syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>Access Rights</th>
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</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Attributes</td>
<td>Global</td>
<td>Block Search</td>
<td>Link</td>
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### DOUBLE $TC_SCP24[32000,32000]$

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<tr>
<td>mm</td>
<td>DBL_MIN</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
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**Not classified** **No restrictions**

### DOUBLE $TC_SCP25[32000,32000]$

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<td>mm</td>
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<tr>
<td>run-in</td>
<td>main run</td>
</tr>
<tr>
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<td>attributes:</td>
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</table>

**Not classified** **No restrictions**
### Double \( \$TC\_SCP26[32000,32000] \)

**Description:**
Offset for \( \$TC\_DP6: \$TC\_SCP26[t,d] \) comparable to \( \$TC\_DP15[t,d] \)
When the ‘flat D number management’ function is active, the syntax is as follows: \( \$TC\_SCP26[d] \)

**Description of field limits:**
- **t:** T number 1 - 32000
- **d:** Cutting edge number / D number 1 - 32000

**Axis identifier:**
- NCK version: 15.00.00
- Unit: mm
- Min.: \( \text{DBL}\_\text{MIN} \)
- Max.: \( \text{DBL}\_\text{MAX} \)

<table>
<thead>
<tr>
<th>run-in</th>
<th>main run</th>
<th>runin slip</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>read:</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>write:</td>
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<td>X</td>
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<td>7</td>
</tr>
</tbody>
</table>

**Attributes:**
- Global
- Block search
- Link

**Not classified**
No restrictions

### Double \( \$TC\_SCP27[32000,32000] \)

**Description:**
Offset for \( \$TC\_DP7: \$TC\_SCP27[t,d] \) comparable to \( \$TC\_DP16[t,d] \)
When the ‘flat D number management’ function is active, the syntax is as follows: \( \$TC\_SCP27[d] \)

**Description of field limits:**
- **t:** T number 1 - 32000
- **d:** Cutting edge number / D number 1 - 32000

**Axis identifier:**
- NCK version: 15.00.00
- Unit: mm
- Min.: \( \text{DBL}\_\text{MIN} \)
- Max.: \( \text{DBL}\_\text{MAX} \)

<table>
<thead>
<tr>
<th>run-in</th>
<th>main run</th>
<th>runin slip</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>read:</td>
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<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
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<td></td>
<td>X</td>
<td></td>
<td></td>
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<td>7</td>
</tr>
</tbody>
</table>

**Attributes:**
- Global
- Block search
- Link

**Not classified**
No restrictions
### $TC\_SCP28[32000,32000]$

**Description:**

$TC\_SCP28[t,d]$ comparable to $TC\_DP17[t,d]$

When the 'flat D number management' function is active, the syntax is as follows:

$TC\_SCP28[d]$

**Description of Field Limits:**

- **t:** T number 1 - 32000
- **d:** Cutting edge number / D number 1 - 32000

**Axis Identifier:**

<table>
<thead>
<tr>
<th>Run-in</th>
<th>Main Run</th>
<th>Runup Slip</th>
<th>Mrun Syn</th>
<th>Pp</th>
<th>Sa</th>
<th>Opt</th>
<th>Oem</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
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<td></td>
</tr>
</tbody>
</table>

**Unit:**

- **Run-in:** mm
- **Main Run:** mm
- **Runup Slip:** mm
- **Mrun Syn:** mm
- **Pp:** DBL_MIN
- **Sa:** DBL_MAX
- **Opt:** DBL_MAX
- **Oem:** DBL_MAX

**Read:** X

**Write:** X

**Attributes:**

- Global: Yes
- Block Search: Yes
- Search: Yes
- Link: Yes

**Rights:**

- Not classified
- No restrictions

---

### $TC\_SCP29[32000,32000]$

**Description:**

Offset for $TC\_DP9$: $TC\_SCP29[t,d]$ comparable to $TC\_DP18[t,d]$

When the 'flat D number management' function is active, the syntax is as follows:

$TC\_SCP29[d]$

**Description of Field Limits:**

- **t:** T number 1 - 32000
- **d:** Cutting edge number / D number 1 - 32000

**Axis Identifier:**

<table>
<thead>
<tr>
<th>Run-in</th>
<th>Main Run</th>
<th>Runup Slip</th>
<th>Mrun Syn</th>
<th>Pp</th>
<th>Sa</th>
<th>Opt</th>
<th>Oem</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Unit:**

- **Run-in:** mm
- **Main Run:** mm
- **Runup Slip:** mm
- **Mrun Syn:** mm
- **Pp:** DBL_MIN
- **Sa:** DBL_MAX
- **Opt:** DBL_MAX
- **Oem:** DBL_MAX

**Read:** X

**Write:** X

**Attributes:**

- Global: Yes
- Block Search: Yes
- Search: Yes
- Link: Yes

**Rights:**

- Not classified
- No restrictions
### $TC\_SCP30[32000,32000]$

**Description:**
Offset for $TC\_DP10$: $TC\_SCP30[t,d]$ comparable to $TC\_DP19[t,d]$

When the 'flat D number management' function is active, the syntax is as follows:

$TC\_SCP30[d]$

**Description of field limits:**
- $t$: T number 1 - 32000
- $d$: Cutting edge number / D number 1 - 32000

**Axis Identifier:**
- NCK version: 15.00.00
- Unit: -
- Minimum: DBL_MIN
- Maximum: DBL_MAX

<table>
<thead>
<tr>
<th>Run-in</th>
<th>Main Run</th>
<th>Run-in Slip</th>
<th>Mrun Syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>Access Rights</th>
<th>Read</th>
<th>Write</th>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>XX 7</td>
</tr>
</tbody>
</table>

**Attributes:**
- Global
- Block Search
- Link
- Not classified
- No restrictions

### $TC\_SCP31[32000,32000]$

**Description:**
Offset for $TC\_DP11$: $TC\_SCP31[t,d]$ comparable to $TC\_DP20[t,d]$

When the 'flat D number management' function is active, the syntax is as follows:

$TC\_SCP31[d]$

**Description of field limits:**
- $t$: T number 1 - 32000
- $d$: Cutting edge number / D number 1 - 32000

**Axis Identifier:**
- NCK version: 15.00.00
- Unit: -
- Minimum: DBL_MIN
- Maximum: DBL_MAX

<table>
<thead>
<tr>
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<th>Main Run</th>
<th>Run-in Slip</th>
<th>Mrun Syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>Access Rights</th>
<th>Read</th>
<th>Write</th>
</tr>
</thead>
<tbody>
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<td></td>
<td></td>
<td>XX 7</td>
</tr>
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**Attributes:**
- Global
- Block Search
- Link
- Not classified
- No restrictions
### 1.8 Cutting edge data for OEM users

**DOUBLE $TC_SCP33[32000,32000]$**

<table>
<thead>
<tr>
<th>Description:</th>
<th>Offset for $TC_DP3$: $TC_SCP33[t,d]$ comparable to $TC_DP12[t,d]$</th>
</tr>
</thead>
<tbody>
<tr>
<td>When the 'flat D number management' function is active, the syntax is as follows:</td>
<td>$TC_SCP33[d]$</td>
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<tr>
<td>Description of field limits:</td>
<td></td>
</tr>
<tr>
<td>t: T number 1 - 32000</td>
<td></td>
</tr>
<tr>
<td>d: Cutting edge number / D number 1 - 32000</td>
<td></td>
</tr>
<tr>
<td>Axis identifier:</td>
<td>NCK version: 15.00.00</td>
</tr>
<tr>
<td>Unit:</td>
<td>mm</td>
</tr>
<tr>
<td>Run-in</td>
<td>main run</td>
</tr>
<tr>
<td>Read:</td>
<td>X</td>
</tr>
<tr>
<td>Write:</td>
<td>X</td>
</tr>
<tr>
<td>Attributes: global</td>
<td>block search</td>
</tr>
<tr>
<td>Not classified</td>
<td>No restrictions</td>
</tr>
</tbody>
</table>

**DOUBLE $TC_SCP34[32000,32000]$**

<table>
<thead>
<tr>
<th>Description:</th>
<th>Offset for $TC_DP4$: $TC_SCP34[t,d]$ comparable to $TC_DP13[t,d]$</th>
</tr>
</thead>
<tbody>
<tr>
<td>When the 'flat D number management' function is active, the syntax is as follows:</td>
<td>$TC_SCP34[d]$</td>
</tr>
<tr>
<td>Description of field limits:</td>
<td></td>
</tr>
<tr>
<td>t: T number 1 - 32000</td>
<td></td>
</tr>
<tr>
<td>d: Cutting edge number / D number 1 - 32000</td>
<td></td>
</tr>
<tr>
<td>Axis identifier:</td>
<td>NCK version: 15.00.00</td>
</tr>
<tr>
<td>Unit:</td>
<td>mm</td>
</tr>
<tr>
<td>Run-in</td>
<td>main run</td>
</tr>
<tr>
<td>Read:</td>
<td>X</td>
</tr>
<tr>
<td>Write:</td>
<td>X</td>
</tr>
<tr>
<td>Attributes: global</td>
<td>block search</td>
</tr>
<tr>
<td>Not classified</td>
<td>No restrictions</td>
</tr>
</tbody>
</table>
### 1.8 Cutting edge data for OEM users

#### DOUBLE $TC\_SCP35[32000,32000]$

<table>
<thead>
<tr>
<th>Description:</th>
<th>Offset for $TC_DP5$: $TC_SCP35[t,d]$ comparable to $TC_DP14[t,d]$ When the 'flat D number management' function is active, the syntax is as follows: $TC_SCP35[d]$</th>
</tr>
</thead>
</table>
| Field limits: | $t$: T number 1 - 32000  
$d$: Cutting edge number / D number 1 - 32000 |
| Axis identifier: | NCK version: 15.00.00 |
| Unit: | mm min.: DBL\_MIN max.: DBL\_MAX |
| Run-in main run runin slip Mrun syn PP SA OPT OEM access rights | read: X X  
write: X X X  
attributes: global block search link |
| Not classified No restrictions |

#### DOUBLE $TC\_SCP36[32000,32000]$

<table>
<thead>
<tr>
<th>Description:</th>
<th>Offset for $TC_DP6$: $TC_SCP36[t,d]$ comparable to $TC_DP15[t,d]$ When the 'flat D number management' function is active, the syntax is as follows: $TC_SCP36[d]$</th>
</tr>
</thead>
</table>
| Field limits: | $t$: T number 1 - 32000  
$d$: Cutting edge number / D number 1 - 32000 |
| Axis identifier: | NCK version: 15.00.00 |
| Unit: | mm min.: DBL\_MIN max.: DBL\_MAX |
| Run-in main run runin slip Mrun syn PP SA OPT OEM access rights | read: X X  
write: X X X  
attributes: global block search link |
| Not classified No restrictions |
### DOUBLE $TC_SCP37[32000,32000]$  
**description:**
Offset for $TC_DP7$: $TC_SCP37[t,d]$ comparable to $TC_DP16[t,d]$
When the 'flat D number management' function is active, the syntax is as follows: $TC_SCP37[d]$

**description of field limits:**
- **t:** T number 1 - 32000
- **d:** Cutting edge number / D number 1 - 32000

<table>
<thead>
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<th>NCK version:</th>
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</tr>
</thead>
<tbody>
<tr>
<td>mm</td>
<td>min.:</td>
<td>DBL_MIN</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin slp</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
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<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
</tr>
<tr>
<td>Not classified</td>
<td>No restrictions</td>
<td></td>
</tr>
</tbody>
</table>

### DOUBLE $TC_SCP38[32000,32000]$  
**description:**
Offset for $TC_DP8$: $TC_SCP38[t,d]$ comparable to $TC_DP17[t,d]$
When the 'flat D number management' function is active, the syntax is as follows: $TC_SCP38[d]$

**description of field limits:**
- **t:** T number 1 - 32000
- **d:** Cutting edge number / D number 1 - 32000

<table>
<thead>
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<tbody>
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<td>mm</td>
<td>min.:</td>
<td>DBL_MIN</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin slp</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
</tr>
<tr>
<td>Not classified</td>
<td>No restrictions</td>
<td></td>
</tr>
</tbody>
</table>
### $TC_SCP39\[32000,32000\]$ 

**Description:**
Offset for $TC\_DP9$: $TC\_SCP39[t,d]$ comparable to $TC\_DP18[t,d]$

When the 'flat D number management' function is active, the syntax is as follows: $TC\_SCP39[d]$  

**Description of field limits:**
- **t:** T number 1 - 32000
- **d:** Cutting edge number / D number 1 - 32000

**Axis identifier:**
- **NCK version:** 15.00.00
- **Unit:** mm
- **Min.:** DBL\_MIN
- **Max.:** DBL\_MAX
- **Run-in:**
  - **Main run:** X
  - **Run-in slip:** X
- **Mrun syn:** X
- **PP:** X
- **SA:** X
- **OPI:** X
- **OEM:** X
- **Access rights:** run-in main run runin slip Mrun syn PP SA OPI OEM access  
  - **Read:** X
  - **Write:** X
- **Attributes:**
  - **Global:** XX
  - **Block search:** XX
  - **Link:** XX
  - **Not classified:** No restrictions

---

### $TC_SCP40\[32000,32000\]$ 

**Description:**
Offset for $TC\_DP10$: $TC\_SCP40[t,d]$ comparable to $TC\_DP19[t,d]$

When the 'flat D number management' function is active, the syntax is as follows: $TC\_SCP40[d]$  

**Description of field limits:**
- **t:** T number 1 - 32000
- **d:** Cutting edge number / D number 1 - 32000

**Axis identifier:**
- **NCK version:** 15.00.00
- **Unit:** mm
- **Min.:** DBL\_MIN
- **Max.:** DBL\_MAX
- **Run-in:**
  - **Main run:** X
  - **Run-in slip:** X
- **Mrun syn:** X
- **PP:** X
- **SA:** X
- **OPI:** X
- **OEM:** X
- **Access rights:** run-in main run runin slip Mrun syn PP SA OPI OEM access  
  - **Read:** X
  - **Write:** X
- **Attributes:**
  - **Global:** XX
  - **Block search:** XX
  - **Link:** XX
  - **Not classified:** No restrictions
### System Variable: $TC_SCP41$ [32000,32000]

**Description:**
Offset for $TC_DP11$: $TC_SCP41[t,d]$ comparable to $TC_DP20[t,d]$
When the 'flat D number management' function is active, the syntax is as follows: $TC_SCP41[d]$

**Description of Field Limits:**
- **t**: T number 1 - 32000
- **d**: Cutting edge number / D number 1 - 32000

**Axis Identifier:**
- NCK version: 15.00.00
- Unit: - **min.**: DBL_MIN, **max.**: DBL_MAX
- **run-in**: main run, runin slip, Mrun syn, PP, SA, OPT, OEM, access rights
- **read**: X, X
- **write**: X, X
- **attributes**: global, block search, link
- Not classified, No restrictions

### System Variable: $TC_SCP43$ [32000,32000]

**Description:**
Offset for $TC_DP3$: $TC_SCP43[t,d]$ comparable to $TC_DP12[t,d]$
When the 'flat D number management' function is active, the syntax is as follows: $TC_SCP43[d]$

**Description of Field Limits:**
- **t**: T number 1 - 32000
- **d**: Cutting edge number / D number 1 - 32000

**Axis Identifier:**
- NCK version: 15.00.00
- Unit: mm, **min.**: DBL_MIN, **max.**: DBL_MAX
- **run-in**: main run, runin slip, Mrun syn, PP, SA, OPT, OEM, access rights
- **read**: X, X
- **write**: X, X
- **attributes**: global, block search, link
- Not classified, No restrictions
### DOUBLE $TC_SCP44[32000,32000]$

**description:**
Offset for $TC_DP4$: $TC_SCP44[t,d]$ comparable to $TC_DP13[t,d]$  
When the 'flat D number management' function is active, the syntax is as follows:  
$TC_SCP44[d]$  

**description of field limits:**  
t: T number 1 - 32000  
d: Cutting edge number / D number 1 - 32000  

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<td>min.:</td>
<td></td>
</tr>
<tr>
<td>max.:</td>
<td></td>
</tr>
<tr>
<td>run-in</td>
<td></td>
</tr>
<tr>
<td>main run</td>
<td></td>
</tr>
<tr>
<td>run in slip</td>
<td></td>
</tr>
<tr>
<td>Mrun syn</td>
<td></td>
</tr>
<tr>
<td>PP</td>
<td></td>
</tr>
<tr>
<td>SA</td>
<td></td>
</tr>
<tr>
<td>OPT</td>
<td></td>
</tr>
<tr>
<td>OEM</td>
<td></td>
</tr>
<tr>
<td>access rights</td>
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<tr>
<td>read:</td>
<td>X</td>
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<tr>
<td>write:</td>
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<td>link</td>
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<td>No restrictions</td>
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### DOUBLE $TC_SCP45[32000,32000]$

**description:**
Offset for $TC_DP5$: $TC_SCP45[t,d]$ comparable to $TC_DP14[t,d]$  
When the 'flat D number management' function is active, the syntax is as follows:  
$TC_SCP45[d]$  

**description of field limits:**  
t: T number 1 - 32000  
d: Cutting edge number / D number 1 - 32000  

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<tr>
<td>run-in</td>
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<td>main run</td>
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<td>run in slip</td>
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<td>SA</td>
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<td>OPT</td>
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<td>access rights</td>
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1.8 Cutting edge data for OEM users

**DOUBLE $TC_SCP46[32000,32000]***

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<td>mm main run:</td>
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<td>mm run in slip:</td>
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**DOUBLE $TC_SCP47[32000,32000]***

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<td>min.:</td>
<td>DBL_MIN</td>
</tr>
<tr>
<td>mm main run:</td>
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<td>mm run in slip:</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>No restrictions:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### $TC_SCP48[32000,32000]$

**Description:**
Offset for $TC_DP8$: $TC_SCP48[t,d]$ comparable to $TC_DP17[t,d]$

When the 'flat D number management' function is active, the syntax is as follows:
$TC_SCP48[d]$

**Description of field limits:**

- **t:** T number 1 - 32000
- **d:** Cutting edge number / D number 1 - 32000

<table>
<thead>
<tr>
<th>Axis Identifier:</th>
<th>NCK Version:</th>
<th>15.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit:</td>
<td>mm</td>
<td>DBL_MIN</td>
</tr>
<tr>
<td>Read:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Write:</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Attributes:</td>
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<td>block search</td>
</tr>
<tr>
<td></td>
<td>Not classified</td>
<td>No restrictions</td>
</tr>
</tbody>
</table>

### $TC_SCP49[32000,32000]$

**Description:**
Offset for $TC_DP9$: $TC_SCP49[t,d]$ comparable to $TC_DP18[t,d]$

When the 'flat D number management' function is active, the syntax is as follows:
$TC_SCP49[d]$

**Description of field limits:**

- **t:** T number 1 - 32000
- **d:** Cutting edge number / D number 1 - 32000

<table>
<thead>
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<th>Axis Identifier:</th>
<th>NCK Version:</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Unit:</td>
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<td>DBL_MIN</td>
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<tr>
<td>Read:</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Write:</td>
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<td>X</td>
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<td>Attributes:</td>
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<td>block search</td>
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<tr>
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<td>No restrictions</td>
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</table>
### $TC_SCP50[32000,32000]$

| Description: | Offset for $TC_DP10$: $TC_SCP50[t,d]$ comparable to $TC_DP19[t,d]$  
|--------------|---------------------------------------------------------------------|
| When the 'flat D number management' function is active, the syntax is as follows: $TC_SCP50[d]$  
| Description of field limits: | t: T number 1 - 32000  
| d: Cutting edge number / D number 1 - 32000  
| Axis identifier: | NCK version: 15.00.00  
| Unit: | run-in main run runin slp Mrun syn PP SA OPT OEM access rights  
| Read: | write:  
| Attributes: | global block search link  
| Not classified | No restrictions

### $TC_SCP51[32000,32000]$

| Description: | Offset for $TC_DP11$: $TC_SCP51[t,d]$ comparable to $TC_DP20[t,d]$  
|--------------|---------------------------------------------------------------------|
| When the 'flat D number management' function is active, the syntax is as follows: $TC_SCP51[d]$  
| Description of field limits: | t: T number 1 - 32000  
| d: Cutting edge number / D number 1 - 32000  
| Axis identifier: | NCK version: 15.00.00  
| Unit: | run-in main run runin slp Mrun syn PP SA OPT OEM access rights  
| Read: | write:  
| Attributes: | global block search link  
| Not classified | No restrictions
### $TC\_SCP53[32000,32000]$ Properties

**Description:** Offset for $TC\_DP3$: $TC\_SCP53[t,d]$ comparable to $TC\_DP12[t,d]$

When the 'flat D number management' function is active, the syntax is as follows: $TC\_SCP53[d]$

<table>
<thead>
<tr>
<th>Field Limits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>$t$: T number 1 - 32000</td>
<td></td>
</tr>
<tr>
<td>$d$: Cutting edge number / D number 1 - 32000</td>
<td></td>
</tr>
</tbody>
</table>

**Axis Identifier:**

- **NCK Version:** 15.00.00
- **Unit:** mm
- **Min.:** DBL_MIN
- **Max.:** DBL_MAX

<table>
<thead>
<tr>
<th>Run-In</th>
<th>Main Run</th>
<th>Run-In Slip</th>
<th>Mrun Syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>Access Rights</th>
<th>Read</th>
<th>Write</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Attributes</th>
<th>Global</th>
<th>Block Search</th>
<th>Link</th>
<th>Access Rights</th>
<th>Read</th>
<th>Write</th>
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</thead>
<tbody>
<tr>
<td></td>
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<td></td>
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</tr>
</tbody>
</table>

- **Not classified**
- **No restrictions**

### $TC\_SCP54[32000,32000]$ Properties

**Description:** Offset for $TC\_DP4$: $TC\_SCP54[t,d]$ comparable to $TC\_DP13[t,d]$

When the 'flat D number management' function is active, the syntax is as follows: $TC\_SCP54[d]$

<table>
<thead>
<tr>
<th>Field Limits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>$t$: T number 1 - 32000</td>
<td></td>
</tr>
<tr>
<td>$d$: Cutting edge number / D number 1 - 32000</td>
<td></td>
</tr>
</tbody>
</table>

**Axis Identifier:**

- **NCK Version:** 15.00.00
- **Unit:** mm
- **Min.:** DBL_MIN
- **Max.:** DBL_MAX

<table>
<thead>
<tr>
<th>Run-In</th>
<th>Main Run</th>
<th>Run-In Slip</th>
<th>Mrun Syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>Access Rights</th>
<th>Read</th>
<th>Write</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Attributes</th>
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<th>Block Search</th>
<th>Link</th>
<th>Access Rights</th>
<th>Read</th>
<th>Write</th>
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<tbody>
<tr>
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</tbody>
</table>

- **Not classified**
- **No restrictions**
### DOUBLE \$TC_SCP55[32000,32000]

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Offset for $TC_DP5: $TC_SCP55[t,d] comparable to $TC_DP14[t,d] When the 'flat D number management' function is active, the syntax is as follows: $TC_SCP55[d]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description of field limits:</th>
</tr>
</thead>
<tbody>
<tr>
<td>( t ): T number 1 - 32000</td>
</tr>
<tr>
<td>( d ): Cutting edge number / D number 1 - 32000</td>
</tr>
</tbody>
</table>

<table>
<thead>
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<th>Axis identifier:</th>
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<tbody>
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<table>
<thead>
<tr>
<th>Unit</th>
<th>min.:</th>
<th>min.:</th>
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<th>max.:</th>
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</thead>
<tbody>
<tr>
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<td>main run</td>
<td>run slip</td>
<td>Mrun syn</td>
<td>PP</td>
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<td>X</td>
<td>X</td>
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<table>
<thead>
<tr>
<th>Access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>read: XX</td>
</tr>
<tr>
<td>write: XX 7</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Attributes</th>
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<tbody>
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</tr>
</tbody>
</table>

Not classified
No restrictions

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### DOUBLE \$TC_SCP56[32000,32000]

<table>
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<tr>
<th>Description</th>
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<tbody>
<tr>
<td>Offset for $TC_DP6: $TC_SCP56[t,d] comparable to $TC_DP15[t,d] When the 'flat D number management' function is active, the syntax is as follows: $TC_SCP56[d]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description of field limits:</th>
</tr>
</thead>
<tbody>
<tr>
<td>( t ): T number 1 - 32000</td>
</tr>
<tr>
<td>( d ): Cutting edge number / D number 1 - 32000</td>
</tr>
</tbody>
</table>

<table>
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<tr>
<th>Axis identifier:</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCK version: 15.00.00</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Unit</th>
<th>min.:</th>
<th>min.:</th>
<th>max.:</th>
<th>max.:</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>main run</td>
<td>run slip</td>
<td>Mrun syn</td>
<td>PP</td>
</tr>
<tr>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>read: XX</td>
</tr>
<tr>
<td>write: XX 7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>global</td>
</tr>
</tbody>
</table>

Not classified
No restrictions
### DOUBLE $TC_SCP57[32000,32000]$

**Description:**
Offset for $TC_DP7$: $TC_SCP57[t,d]$ comparable to $TC_DP16[t,d]$
When the 'flat D number management' function is active, the syntax is as follows: $TC_SCP57[d]$

**Description of field limits:**
- **t**: T number 1 - 32000
- **d**: Cutting edge number / D number 1 - 32000

**Axis identifier:**
- **run-in**: mm
- **main run**: min.
- **run-in slip**: DBL_MIN
- **Min syn**: max.: DBL_MAX

**Unit:** mm
**Min.:** DBL_MIN
**Max.:** DBL_MAX

**Read:** X
**Write:** X

**Attributes:**
- **Global**: block search
- **Link**: No restrictions

---

### DOUBLE $TC_SCP58[32000,32000]$

**Description:**
Offset for $TC_DP8$: $TC_SCP58[t,d]$ comparable to $TC_DP17[t,d]$
When the 'flat D number management' function is active, the syntax is as follows: $TC_SCP58[d]$

**Description of field limits:**
- **t**: T number 1 - 32000
- **d**: Cutting edge number / D number 1 - 32000

**Axis identifier:**
- **run-in**: mm
- **main run**: min.
- **run-in slip**: DBL_MIN
- **Min syn**: max.: DBL_MAX

**Unit:** mm
**Min.:** DBL_MIN
**Max.:** DBL_MAX

**Read:** X
**Write:** X

**Attributes:**
- **Global**: block search
- **Link**: No restrictions
1.8 Cutting edge data for OEM users

<table>
<thead>
<tr>
<th>DOUBLE $TC_SCP59[32000,32000]$</th>
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</thead>
<tbody>
<tr>
<td>Offset for $TC_DP9$: $TC_SCP59[t,d]$ comparable to $TC_DP18[t,d]$</td>
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</tr>
<tr>
<td>When the 'flat D number management' function is active, the syntax is as follows: $TC_SCP59[d]$</td>
<td></td>
</tr>
<tr>
<td>description of field limits:</td>
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</tr>
<tr>
<td>t: T number 1 - 32000</td>
<td></td>
</tr>
<tr>
<td>d: Cutting edge number / D number 1 - 32000</td>
<td></td>
</tr>
<tr>
<td>axis identifier:</td>
<td></td>
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<td>NCK version: 15.00.00</td>
<td></td>
</tr>
<tr>
<td>unit: mm min.: DBL_MIN max.: DBL_MAX</td>
<td></td>
</tr>
<tr>
<td>run-in main run runin slip Mrun syn PP SA OPT OEM access rights</td>
<td></td>
</tr>
<tr>
<td>read: X</td>
<td></td>
</tr>
<tr>
<td>write: X</td>
<td></td>
</tr>
<tr>
<td>attributes: global block search link</td>
<td></td>
</tr>
<tr>
<td>read: XX</td>
<td></td>
</tr>
<tr>
<td>write: XX 7</td>
<td></td>
</tr>
<tr>
<td>attributes: global block search link</td>
<td></td>
</tr>
<tr>
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<table>
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<tbody>
<tr>
<td>Offset for $TC_DP10$: $TC_SCP60[t,d]$ comparable to $TC_DP19[t,d]$</td>
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<tr>
<td>d: Cutting edge number / D number 1 - 32000</td>
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<tr>
<td>axis identifier:</td>
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<tr>
<td>NCK version: 15.00.00</td>
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</tr>
<tr>
<td>unit: mm min.: DBL_MIN max.: DBL_MAX</td>
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</tr>
<tr>
<td>run-in main run runin slip Mrun syn PP SA OPT OEM access rights</td>
<td></td>
</tr>
<tr>
<td>read: X</td>
<td></td>
</tr>
<tr>
<td>write: X</td>
<td></td>
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<tr>
<td>attributes: global block search link</td>
<td></td>
</tr>
<tr>
<td>read: XX</td>
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<tr>
<td>write: XX 7</td>
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<tr>
<td>attributes: global block search link</td>
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### 1.8 Cutting edge data for OEM users

<table>
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<th>DOUBLE</th>
<th>$TC_{SCP61}[32000,32000]</th>
<th>description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Offset for $TC_{DP11}$: $TC_{SCP61}[t,d]$ comparable to $TC_{DP20}[t,d]$</td>
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<td></td>
</tr>
<tr>
<td>When the 'flat D number management' function is active, the syntax is as follows: $TC_{SCP61}[d]$</td>
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<td></td>
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<tr>
<td>d: Cutting edge number / D number 1 - 32000</td>
<td></td>
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<tr>
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<td></td>
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<tr>
<td>NCK version: 15.00.00</td>
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<tr>
<td>unit:</td>
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<td></td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin slp</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
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</tr>
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<tr>
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</tr>
</thead>
<tbody>
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<td></td>
<td></td>
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<tr>
<td>description of field limits:</td>
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<td></td>
</tr>
<tr>
<td>t: T number 1 - 32000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d: Cutting edge number / D number 1 - 32000</td>
<td></td>
<td></td>
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<tr>
<td>axis identifier:</td>
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<td>unit: mm</td>
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<tr>
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<td>main run</td>
<td>runin slp</td>
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<tr>
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<tr>
<td>write:</td>
<td>X</td>
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<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
</tr>
<tr>
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</tbody>
</table>
### DOUBLE \$TC_SCP64[32000,32000]

**Description:**
Offset for \$TC_DP4: \$TC_SCP64[t,d] comparable to \$TC_DP13[t,d]

When the 'flat D number management' function is active, the syntax is as follows:
\$TC_SCP64[d]

**Description of field limits:**
- **t:** T number 1 - 32000
- **d:** Cutting edge number / D number 1 - 32000

**Axis Identifier:**
- **NCK version:** 15.00.00
- **Unit:** mm
- **Run-in:** min.: DBL_MIN
- **Main Run:** min.: DBL_MIN
- **Runin Slp:** min.: DBL_MIN
- **Mrun Syn:** min.: DBL_MIN
- **PP:** min.: DBL_MIN
- **SA:** min.: DBL_MIN
- **OPT:** min.: DBL_MIN
- **OEM:** min.: DBL_MIN
- **Access Rights:**
  - **Read:** XX
  - **Write:** XX 7

**Attributes:**
- **Global:** Yes
- **Block Search:** Yes
- **Link:** Yes

**Not classified:** No restrictions

### DOUBLE \$TC_SCP65[32000,32000]

**Description:**
Offset for \$TC_DP5: \$TC_SCP65[t,d] comparable to \$TC_DP14[t,d]

When the 'flat D number management' function is active, the syntax is as follows:
\$TC_SCP65[d]

**Description of field limits:**
- **t:** T number 1 - 32000
- **d:** Cutting edge number / D number 1 - 32000

**Axis Identifier:**
- **NCK version:** 15.00.00
- **Unit:** mm
- **Run-in:** min.: DBL_MIN
- **Main Run:** min.: DBL_MIN
- **Runin Slp:** min.: DBL_MIN
- **Mrun Syn:** min.: DBL_MIN
- **PP:** min.: DBL_MIN
- **SA:** min.: DBL_MIN
- **OPT:** min.: DBL_MIN
- **OEM:** min.: DBL_MIN
- **Access Rights:**
  - **Read:** XX
  - **Write:** XX 7

**Attributes:**
- **Global:** Yes
- **Block Search:** Yes
- **Link:** Yes

**Not classified:** No restrictions
**DOUBLE $TC_SCP66[32000,32000]$**

| Description: | Offset for $TC_DP6$: $TC_SCP66[t,d]$ comparable to $TC_DP15[t,d]$  
When the 'flat D number management' function is active, the syntax is as follows: $TC_SCP66[d]$  
description of field limits:  
t: T number 1 - 32000  
d: Cutting edge number / D number 1 - 32000  
axis identifier: NCK version: 15.00.00  
unit: mm min.: DBL_MIN max.: DBL_MAX  
run-in main run runin slip Mrun syn PP SA OPT OEM access rights  
read: X X  
write: X X  
attributes: global block search link  
Not classified No restrictions |

**DOUBLE $TC_SCP67[32000,32000]$**

| Description: | Offset for $TC_DP7$: $TC_SCP67[t,d]$ comparable to $TC_DP16[t,d]$  
When the 'flat D number management' function is active, the syntax is as follows: $TC_SCP67[d]$  
description of field limits:  
t: T number 1 - 32000  
d: Cutting edge number / D number 1 - 32000  
axis identifier: NCK version: 15.00.00  
unit: mm min.: DBL_MIN max.: DBL_MAX  
run-in main run runin slip Mrun syn PP SA OPT OEM access rights  
read: X X  
write: X X  
attributes: global block search link  
Not classified No restrictions |
### DOUBLE $TC\_SCP68[32000,32000]$

<table>
<thead>
<tr>
<th>Description:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Offset for $TC_DP8$: $TC_SCP68[t,d]$ comparable to $TC_DP17[t,d]$</td>
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</tr>
<tr>
<td>When the 'flat D number management' function is active, the syntax is as follows: $TC_SCP68[d]$</td>
<td></td>
</tr>
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</table>

#### Description of Field Limits:

- **t:** T number 1 - 32000
- **d:** Cutting edge number / D number 1 - 32000

#### Axis Identifier:

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<th>runin slip</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>Access Rights</th>
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<th>write</th>
<th>Attributes:</th>
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<td>X</td>
<td>global, block search</td>
</tr>
<tr>
<td>min.:</td>
<td>DBL_MIN</td>
<td>DBL_MIN</td>
<td>DBL_MIN</td>
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#### NCK Version:

- 15.00.00

#### Run-in Main Run Runin Stp Mrun Syn PP SA OPT OEM Access Rights

- X
- X
- X

#### Read

- X

#### Write

- X

#### Attributes:

- global
- block search
- link

- Not classified
- No restrictions

---

### DOUBLE $TC\_SCP69[32000,32000]$

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<td>Offset for $TC_DP9$: $TC_SCP69[t,d]$ comparable to $TC_DP18[t,d]$</td>
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<tr>
<td>When the 'flat D number management' function is active, the syntax is as follows: $TC_SCP69[d]$</td>
<td></td>
</tr>
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</table>

#### Description of Field Limits:

- **t:** T number 1 - 32000
- **d:** Cutting edge number / D number 1 - 32000

#### Axis Identifier:

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<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
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<th>Access Rights</th>
<th>read</th>
<th>write</th>
<th>Attributes:</th>
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<td>global, block search</td>
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</table>

#### NCK Version:

- 15.00.00

#### Run-in Main Run Runin Stp Mrun Syn PP SA OPT OEM Access Rights

- X
- X
- X

#### Read

- X

#### Write

- X

#### Attributes:

- global
- block search
- link

- Not classified
- No restrictions
### DOUBLE \$TC_SCP70[32000,32000]

**Description:**
Offset for \$TC_DP10: \$TC_SCP70[t,d] comparable to \$TC_DP19[t,d]

When the 'flat D number management' function is active, the syntax is as follows:
\$TC_SCP70[d]

**Description of field limits:**
- **t:** T number 1 - 32000
- **d:** Cutting edge number / D number 1 - 32000

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<th>run-in slip</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
</tr>
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<tbody>
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<td></td>
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<tr>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Write:</td>
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<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Attributes:**
- Global
- Block search
- Link

**Not classified**
No restrictions

### DOUBLE \$TC_SCP71[32000,32000]

**Description:**
Offset for \$TC_DP11: \$TC_SCP71[t,d] comparable to \$TC_DP20[t,d]

When the 'flat D number management' function is active, the syntax is as follows:
\$TC_SCP71[d]

**Description of field limits:**
- **t:** T number 1 - 32000
- **d:** Cutting edge number / D number 1 - 32000

<table>
<thead>
<tr>
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<th>run-in slip</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
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<td></td>
<td></td>
</tr>
<tr>
<td>Read:</td>
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<td></td>
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<td></td>
<td></td>
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<td>X</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**Attributes:**
- Global
- Block search
- Link

**Not classified**
No restrictions
1.8 Cutting edge data for OEM users

### DOUBLE $TC_ECP13[32000,32000]$

| description: | Offset for $TC_DP3$: $TC_ECP13[t,d]$ comparable to $TC_DP12[t,d]$  
When the ’flat D number management’ function is active, the syntax is as follows: $TC_ECP13[d]$ |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>description of field limits:</td>
<td></td>
</tr>
</tbody>
</table>
  
  t: T number 1 - 32000  
  d: Cutting edge number / D number 1 - 32000 |
| axis identifier: | 
  
  NCK version: 15.00.00  
  unit: mm min.: DBL_MIN max.: DBL_MAX |
| run-in | main run | runin slip | Mrun syn | PP | SA | OPT | OEM | access rights |
| read: | X | | | | | | |  |
| write: | X | | | | | | |  |
| attributes: | global | block search | link |
| Not classified | No restrictions |

### DOUBLE $TC_ECP14[32000,32000]$

| description: | Offset for $TC_DP4$: $TC_ECP14[t,d]$ comparable to $TC_DP13[t,d]$  
When the ’flat D number management’ function is active, the syntax is as follows: $TC_ECP14[d]$ |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>description of field limits:</td>
<td></td>
</tr>
</tbody>
</table>
  
  t: T number 1 - 32000  
  d: Cutting edge number / D number 1 - 32000 |
| axis identifier: | 
  
  NCK version: 15.00.00  
  unit: mm min.: DBL_MIN max.: DBL_MAX |
| run-in | main run | runin slip | Mrun syn | PP | SA | OPT | OEM | access rights |
| read: | X | | | | | | |  |
| write: | X | | | | | | |  |
| attributes: | global | block search | link |
| Not classified | No restrictions |
### DOUBLE $TC_ECP15[32000,32000]$

**description:**
Offset for $TC_DP5$: $TC_ECP15[t,d]$ comparable to $TC_DP14[t,d]$
When the 'flat D number management' function is active, the syntax is as follows:
$TC_ECP15[d]$

**description of field limits:**
- **t:** T number 1 - 32000
- **d:** Cutting edge number / D number 1 - 32000

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<td>main run</td>
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</tr>
<tr>
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</tr>
<tr>
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### $TC_ECP17[32000,32000]$

**Description:**
Offset for $TC_DP7$: $TC_ECP17[t,d]$ comparable to $TC_DP16[t,d]$.
When the 'flat D number management' function is active, the syntax is as follows: $TC_ECP17[d]$

**Description of field limits:**
- **t**: T number 1 - 32000
- **d**: Cutting edge number / D number 1 - 32000

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<td>PP</td>
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<td>SA</td>
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<td>OPT</td>
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</tr>
<tr>
<td>OEM</td>
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</tr>
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<td>Access rights</td>
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| NCK version: | 15.00.00 |

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</tbody>
</table>

| Not classified | No restrictions |

### $TC_ECP18[32000,32000]$

**Description:**
Offset for $TC_DP8$: $TC_ECP18[t,d]$ comparable to $TC_DP17[t,d]$.
When the 'flat D number management' function is active, the syntax is as follows: $TC_ECP18[d]$

**Description of field limits:**
- **t**: T number 1 - 32000
- **d**: Cutting edge number / D number 1 - 32000

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<th>Max.:</th>
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</tr>
<tr>
<td>run in slip</td>
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<td></td>
</tr>
<tr>
<td>Mrun syn</td>
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<td></td>
</tr>
<tr>
<td>PP</td>
<td></td>
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<td></td>
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<tr>
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<td></td>
</tr>
<tr>
<td>OPT</td>
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</tr>
<tr>
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<th>Attributes</th>
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<tbody>
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| NCK version: | 15.00.00 |

<table>
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| Not classified | No restrictions |
### System variable 01/2008

#### 1.8 Cutting edge data for OEM users

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<tr>
<th>DOUBLE $TC_ECP19[32000,32000]$</th>
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<td>Offset for $TC_DP9$: $TC_ECP19[t,d]$ comparable to $TC_DP18[t,d]$ When the 'flat D number management' function is active, the syntax is as follows: $TC_ECP19[d]$</td>
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</tbody>
</table>

**description of field limits:**
- t: T number 1 - 32000
- d: Cutting edge number / D number 1 - 32000

**axis identifier:**
- NCK version: 15.00.00
- unit: mm

<table>
<thead>
<tr>
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<th>runin slip</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>write:</td>
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**attributes:**
- global
- block search
- link
- Not classified
- No restrictions

<table>
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<tbody>
<tr>
<td>Offset for $TC_DP10$: $TC_ECP20[t,d]$ comparable to $TC_DP19[t,d]$ When the 'flat D number management' function is active, the syntax is as follows: $TC_ECP20[d]$</td>
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</tbody>
</table>

**description of field limits:**
- t: T number 1 - 32000
- d: Cutting edge number / D number 1 - 32000

**axis identifier:**
- NCK version: 15.00.00
- unit: mm

<table>
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<th>runin slip</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
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<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
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<td>X</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**attributes:**
- global
- block search
- link
- Not classified
- No restrictions
### $\texttt{TC\_ECP21}[32000,32000]\$

**Description:**
Offset for $\texttt{TC\_DP11}: \texttt{TC\_ECP21}[t,d]$ comparable to $\texttt{TC\_DP20}[t,d]$  
When the 'flat D number management' function is active, the syntax is as follows: 
$\texttt{TC\_ECP21}[d]$  

**Description of field limits:**
- \(t\): T number 1 - 32000  
- \(d\): Cutting edge number / D number 1 - 32000  

**Axis Identifier:**
- \(NCK\) version: 15.00.00  
- Unit:  
  - min.: DBL\_MIN  
  - max.: DBL\_MAX  

**Run-in Main Run Runin Stp Mrun Syn PP SA OPT OEM Access Rights:**
- read: X 
- write: X 
- attributes: global block search link
  - Not classified No restrictions

### $\texttt{TC\_ECP23}[32000,32000]\$

**Description:**
Offset for $\texttt{TC\_DP3}: \texttt{TC\_ECP23}[t,d]$ comparable to $\texttt{TC\_DP12}[t,d]$  
When the 'flat D number management' function is active, the syntax is as follows: 
$\texttt{TC\_ECP23}[d]$  

**Description of field limits:**
- \(t\): T number 1 - 32000  
- \(d\): Cutting edge number / D number 1 - 32000  

**Axis Identifier:**
- \(NCK\) version: 15.00.00  
- Unit:  
  - min.: DBL\_MIN  
  - max.: DBL\_MAX  

**Run-in Main Run Runin Stp Mrun Syn PP SA OPT OEM Access Rights:**
- read: X 
- write: X 
- attributes: global block search link
  - Not classified No restrictions
### 1.8 Cutting edge data for OEM users

#### DOUBLE $TC_ECP24[32000,32000]$

**description:**
Offset for $TC_DP4$: $TC_ECP24[t,d]$ comparable to $TC_DP13[t,d]$

When the 'flat D number management' function is active, the syntax is as follows:

$TC_ECP24[d]$

**description of field limits:**

- **t:** T number 1 - 32000
- **d:** Cutting edge number / D number 1 - 32000

**unit:** mm

**run-in main run runin slip Mrun syn PP SA OPT OEM access rights**

- **read:** X
- **write:** X

**attributes:** global block search link

<table>
<thead>
<tr>
<th>run-in</th>
<th>main run</th>
<th>runin slip</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
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<th>access rights</th>
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<tbody>
<tr>
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**unit:** mm

**NCK version:** 15.00.00

**access rights:**

- **read:** XX
- **write:** XX 7

**attributes:** global block search link

- **Not classified:** No restrictions

#### DOUBLE $TC_ECP25[32000,32000]$

**description:**
Offset for $TC_DP5$: $TC_ECP25[t,d]$ comparable to $TC_DP14[t,d]$

When the 'flat D number management' function is active, the syntax is as follows:

$TC_ECP25[d]$

**description of field limits:**

- **t:** T number 1 - 32000
- **d:** Cutting edge number / D number 1 - 32000

**unit:** mm

**run-in main run runin slip Mrun syn PP SA OPT OEM access rights**

- **read:** X
- **write:** X

**attributes:** global block search link

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**unit:** mm

**NCK version:** 15.00.00

**access rights:**

- **read:** XX
- **write:** XX 7

**attributes:** global block search link

- **Not classified:** No restrictions
### DOUBLE $TC_ECP26\{32000,32000\}$

**Description:**
Offset for $TC_DP6$: $TC_ECP26[t,d]$ comparable to $TC_DP15[t,d]$  
When the 'flat D number management' function is active, the syntax is as follows: $TC_ECP26[d]$

**Description of Field Limits:**
- **t:** T number 1 - 32000  
- **d:** Cutting edge number / D number 1 - 32000

**Unit:**
- **run-in:** mm  
- **main run:**  
- **runin slip:**  
- **Mrun syn:**  
- **PP:**  
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- **OPT:**  
- **OEM:**  
- **Access Rights:**

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**Attributes:**
- **Global:**  
- **Block Search:**  
- **Link:**  
- **Not classified:**  
- **No restrictions:**

### DOUBLE $TC_ECP27\{32000,32000\}$

**Description:**
Offset for $TC_DP7$: $TC_ECP27[t,d]$ comparable to $TC_DP16[t,d]$  
When the 'flat D number management' function is active, the syntax is as follows: $TC_ECP27[d]$

**Description of Field Limits:**
- **t:** T number 1 - 32000  
- **d:** Cutting edge number / D number 1 - 32000

**Unit:**
- **run-in:** mm  
- **main run:**  
- **runin slip:**  
- **Mrun syn:**  
- **PP:**  
- **SA:**  
- **OPT:**  
- **OEM:**  
- **Access Rights:**

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**Attributes:**
- **Global:**  
- **Block Search:**  
- **Link:**  
- **Not classified:**  
- **No restrictions:**
### System Variable: $TC_ECP28[32000,32000]$

**Description:**
$TC_ECP28[t,d]$ comparable to $TC_DP17[t,d]$

When the 'flat D number management' function is active, the syntax is as follows:
$TC_ECP28[d]$

**Description of Field Limits:**
- **t:** T number 1 - 32000
- **d:** Cutting edge number / D number 1 - 32000

**Axis Identifier:**
- NCK version: 15.00.00
- Unit: mm
- Min.: DBL_MIN
- Max.: DBL_MAX
- Run-in:
  - Main run
  - Run-in slap
  - Mrun syn
- PP
- SA
- OPT
- OEM
- Access rights:
  - Read: X
  - Write: X

**Attributes:**
- Global
- Block search
- Link
- Not classified
- No restrictions

### System Variable: $TC_ECP29[32000,32000]$

**Description:**
Offset for $TC_DP9$: $TC_ECP29[t,d]$ comparable to $TC_DP18[t,d]$

When the 'flat D number management' function is active, the syntax is as follows:
$TC_ECP29[d]$

**Description of Field Limits:**
- **t:** T number 1 - 32000
- **d:** Cutting edge number / D number 1 - 32000

**Axis Identifier:**
- NCK version: 15.00.00
- Unit: mm
- Min.: DBL_MIN
- Max.: DBL_MAX
- Run-in:
  - Main run
  - Run-in slap
  - Mrun syn
- PP
- SA
- OPT
- OEM
- Access rights:
  - Read: X
  - Write: X

**Attributes:**
- Global
- Block search
- Link
- Not classified
- No restrictions
### $TC_ECP30[32000,32000]$  

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### $TC_ECP31[32000,32000]$  

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## Double  $TC\_ECP33[32000,32000]$  

**description:**
Offset for $TC\_DP3$: $TC\_ECP33[t,d]$ comparable to $TC\_DP12[t,d]$  
When the 'flat D number management' function is active, the syntax is as follows:

$TC\_ECP33[d]$

**description of field limits:**
- $t$: T number 1 - 32000  
- $d$: Cutting edge number / D number 1 - 32000

**axis identifier:**
- NCK version: 15.00.00
- unit: mm
- min.: DBL\_MIN
- max.: DBL\_MAX

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**attributes:**
- global block search link
- Not classified No restrictions

## Double  $TC\_ECP34[32000,32000]$  

**description:**
Offset for $TC\_DP4$: $TC\_ECP34[t,d]$ comparable to $TC\_DP13[t,d]$  
When the 'flat D number management' function is active, the syntax is as follows:

$TC\_ECP34[d]$

**description of field limits:**
- $t$: T number 1 - 32000  
- $d$: Cutting edge number / D number 1 - 32000

**axis identifier:**
- NCK version: 15.00.00
- unit: mm
- min.: DBL\_MIN
- max.: DBL\_MAX

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**attributes:**
- global block search link
- Not classified No restrictions
### DOUBLE $TC_ECP35[32000,32000]$

**description:**
Offset for $TC_DP5$: $TC_ECP35[t,d]$ comparable to $TC_DP14[t,d]$
When the 'flat D number management' function is active, the syntax is as follows:
$TC_ECP35[d]$

**description of field limits:**
- **t:** T number 1 - 32000
- **d:** Cutting edge number / D number 1 - 32000

**axis identifier:**

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**attributes:**
- Global
- Block search
- Link

**unit:** mm
**min.:** DBL_MIN
**max.:** DBL_MAX
**access rights:**
- Read: XX
- Write: XX

### DOUBLE $TC_ECP36[32000,32000]$

**description:**
Offset for $TC_DP6$: $TC_ECP36[t,d]$ comparable to $TC_DP15[t,d]$
When the 'flat D number management' function is active, the syntax is as follows:
$TC_ECP36[d]$

**description of field limits:**
- **t:** T number 1 - 32000
- **d:** Cutting edge number / D number 1 - 32000

**axis identifier:**

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**attributes:**
- Global
- Block search
- Link

**unit:** mm
**min.:** DBL_MIN
**max.:** DBL_MAX
**access rights:**
- Read: XX
- Write: XX

---

© Siemens AG 2008 All Rights Reserved
SINUMERIK 840D sl/840Di sl/ 840D/ 840Di, List of System Variables (PGA1), 01/2008
### $TC_ECP37[32000,32000]$

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<th>Offset for $TC_DP7$: $TC_ECP37[t,d]$ comparable to $TC_DP16[t,d]$</th>
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**Description of Field Limits:**
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**Attributes:**
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- No restrictions

### $TC_ECP38[32000,32000]$

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**Description of Field Limits:**
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**Attributes:**
- Global
- Block search
- Link
- Not classified
- No restrictions
1.8 Cutting edge data for OEM users

DOUBLE $TC_ECP39[32000,32000]$

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DOUBLE $TC_ECP40[32000,32000]$

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### System Variable 01/2008

#### 1.8 Cutting edge data for OEM users

**$TC_ECP41[32000,32000]$**

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<td>When the 'flat D number management' function is active, the syntax is as follows: $TC_ECP41[d]$</td>
</tr>
</tbody>
</table>

**Description of Field Limits:**
- **t:** T number 1 - 32000
- **d:** Cutting edge number / D number 1 - 32000

**Axis Identifier:**
- NCK version: 15.00.00
- Unit: mm
- Min.: DBL_MIN
- Max.: DBL_MAX

<table>
<thead>
<tr>
<th>Run-in</th>
<th>Main Run</th>
<th>Runin Slp</th>
<th>Mrun Syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td>X</td>
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<td></td>
<td></td>
<td></td>
<td>7</td>
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</tbody>
</table>

**Attributes:**
- Global
- Block Search
- Link
- Not classified
- No restrictions

**$TC_ECP43[32000,32000]$**

<table>
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<tbody>
<tr>
<td>Offset for $TC_DP3$: $TC_ECP43[t,d]$ comparable to $TC_DP12[t,d]$</td>
</tr>
<tr>
<td>When the 'flat D number management' function is active, the syntax is as follows: $TC_ECP43[d]$</td>
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</tbody>
</table>

**Description of Field Limits:**
- **t:** T number 1 - 32000
- **d:** Cutting edge number / D number 1 - 32000

**Axis Identifier:**
- NCK version: 15.00.00
- Unit: mm
- Min.: DBL_MIN
- Max.: DBL_MAX

<table>
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<th>Runin Slp</th>
<th>Mrun Syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
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<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td>X</td>
<td></td>
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</table>

**Attributes:**
- Global
- Block Search
- Link
- Not classified
- No restrictions
### DOUBLE \texttt{\$TC_ECP44[32000,32000]}  

**description:**
Offset for $TC\_DP4$: $TC\_ECP44[t,d]$ comparable to $TC\_DP13[t,d]$  
When the 'flat D number management' function is active, the syntax is as follows: $TC\_ECP44[d]$

**description of field limits:**
- t: T number 1 - 32000
- d: Cutting edge number / D number 1 - 32000

<table>
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<th>unit:</th>
<th>min.:</th>
<th>max.:</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
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<td>main run</td>
<td>runin slip</td>
<td>Mrun syn</td>
<td>PP</td>
</tr>
<tr>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
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</table>

### DOUBLE \texttt{\$TC_ECP45[32000,32000]}  

**description:**
Offset for $TC\_DP5$: $TC\_ECP45[t,d]$ comparable to $TC\_DP14[t,d]$  
When the 'flat D number management' function is active, the syntax is as follows: $TC\_ECP45[d]$

**description of field limits:**
- t: T number 1 - 32000
- d: Cutting edge number / D number 1 - 32000

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<th>unit:</th>
<th>min.:</th>
<th>max.:</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin slip</td>
<td>Mrun syn</td>
<td>PP</td>
</tr>
<tr>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### $TC_ECP46[32000,32000]$ Description:
Offset for $TC_DP6$: $TC_ECP46[t,d]$ comparable to $TC_DP15[t,d]$

When the 'flat D number management' function is active, the syntax is as follows: $TC_ECP46[d]$

**Description of Field Limits:**
- **t**: T number 1 - 32000
- **d**: Cutting edge number / D number 1 - 32000

**Axis Identifier:**
- **NCK version**: 15.00.00
- **Unit**: mm
- **Min.**: DBL_MIN
- **Max.**: DBL_MAX

**Run-In Main Run Runin Stp Mrun Syn PP SA OPT OEM Access Rights**
- **Read**: X
- **Write**: X

**Attributes**: Global block search link

Not classified No restrictions

---

### $TC_ECP47[32000,32000]$ Description:
Offset for $TC_DP7$: $TC_ECP47[t,d]$ comparable to $TC_DP16[t,d]$

When the 'flat D number management' function is active, the syntax is as follows: $TC_ECP47[d]$

**Description of Field Limits:**
- **t**: T number 1 - 32000
- **d**: Cutting edge number / D number 1 - 32000

**Axis Identifier:**
- **NCK version**: 15.00.00
- **Unit**: mm
- **Min.**: DBL_MIN
- **Max.**: DBL_MAX

**Run-In Main Run Runin Stp Mrun Syn PP SA OPT OEM Access Rights**
- **Read**: X
- **Write**: X

**Attributes**: Global block search link

Not classified No restrictions
### DOUBLE $TC_ECP48[32000,32000]$  

**Description:**
Offset for $TC_DP8$: $TC_ECP48[t,d]$ comparable to $TC_DP17[t,d]$
When the 'flat D number management' function is active, the syntax is as follows: $TC_ECP48[d]$

**Description of field limits:**
- $t$: T number 1 - 32000
- $d$: Cutting edge number / D number 1 - 32000

**Axis identifier:**
- NCK version: 15.00.00
- Unit: mm
- Min.: DBL_MIN
- Max.: DBL_MAX
- Run-in
- Main run
- Runin slip
- Mrun syn
- PP
- SA
- OPT
- OEM
- Access rights:
  - Read: X
  - Write: X

**Attributes:**
- Global
- Block search
- Link
- Not classified
- No restrictions

### DOUBLE $TC_ECP49[32000,32000]$  

**Description:**
Offset for $TC_DP9$: $TC_ECP49[t,d]$ comparable to $TC_DP18[t,d]$
When the 'flat D number management' function is active, the syntax is as follows: $TC_ECP49[d]$

**Description of field limits:**
- $t$: T number 1 - 32000
- $d$: Cutting edge number / D number 1 - 32000

**Axis identifier:**
- NCK version: 15.00.00
- Unit: mm
- Min.: DBL_MIN
- Max.: DBL_MAX
- Run-in
- Main run
- Runin slip
- Mrun syn
- PP
- SA
- OPT
- OEM
- Access rights:
  - Read: X
  - Write: X

**Attributes:**
- Global
- Block search
- Link
- Not classified
- No restrictions
### System Variable

**1.8 Cutting edge data for OEM users**

#### DOUBLE $TC_ECP50[32000,32000]$

<table>
<thead>
<tr>
<th>Description:</th>
<th>Offset for $TC_DP10$: $TC_ECP50[t,d]$ comparable to $TC_DP19[t,d]$</th>
</tr>
</thead>
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<tr>
<td>When the 'flat D number management' function is active, the syntax is as follows:</td>
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<tr>
<td>$TC_ECP50[d]$</td>
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**Description of field limits:**
- **t**: T number 1 - 32000
- **d**: Cutting edge number / D number 1 - 32000

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<tr>
<td><strong>main run</strong></td>
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</tr>
<tr>
<td><strong>runin slip</strong></td>
<td>X</td>
</tr>
<tr>
<td><strong>Mrun syn</strong></td>
<td>X</td>
</tr>
<tr>
<td><strong>PP</strong></td>
<td>X</td>
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<tr>
<td><strong>SA</strong></td>
<td>X</td>
</tr>
<tr>
<td><strong>OPT</strong></td>
<td>X</td>
</tr>
<tr>
<td><strong>OEM</strong></td>
<td>X</td>
</tr>
<tr>
<td><strong>access rights</strong></td>
<td>X</td>
</tr>
<tr>
<td><strong>read</strong></td>
<td>X</td>
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<tr>
<td><strong>write</strong></td>
<td>X</td>
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<td><strong>attributes</strong>: global block search link</td>
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<td>Not classified No restrictions</td>
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</table>

#### DOUBLE $TC_ECP51[32000,32000]$

<table>
<thead>
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<th>Description:</th>
<th>Offset for $TC_DP11$: $TC_ECP51[t,d]$ comparable to $TC_DP20[t,d]$</th>
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<tbody>
<tr>
<td>When the 'flat D number management' function is active, the syntax is as follows:</td>
<td></td>
</tr>
<tr>
<td>$TC_ECP51[d]$</td>
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**Description of field limits:**
- **t**: T number 1 - 32000
- **d**: Cutting edge number / D number 1 - 32000

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<tr>
<th>Axis identifier:</th>
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<tr>
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<td><strong>min.</strong></td>
</tr>
<tr>
<td><strong>main run</strong></td>
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</tr>
<tr>
<td><strong>runin slip</strong></td>
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<tr>
<td><strong>Mrun syn</strong></td>
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<td>X</td>
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<tr>
<td><strong>access rights</strong></td>
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<tr>
<td><strong>read</strong></td>
<td>X</td>
</tr>
<tr>
<td><strong>write</strong></td>
<td>X</td>
</tr>
<tr>
<td><strong>attributes</strong>: global block search link</td>
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</tr>
<tr>
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</table>
### DOUBLE $TC_ECP53[32000,32000]$  
**description:**
Offset for $TC_DP3$: $TC_ECP53[t,d]$ comparable to $TC_DP12[t,d]$  
When the 'flat D number management' function is active, the syntax is as follows: $TC_ECP53[d]$  
**description of field limits:**
| t: T number | 1 - 32000 |
| d: Cutting edge number / D number | 1 - 32000 |
| **axis identifier:** | NCK version: 15.00.00 |
| **unit:** | run-in | main run | runin slip | Mrun syn | PP | SA | OPT | OEM | access rights |
| | mm | min.: | DBL_MIN | max.: | DBL_MAX |
| read: | X | X |
| write: | X | 7 |
| **attributes:** | global | block search | link |
| | Not classified | No restrictions |

### DOUBLE $TC_ECP54[32000,32000]$  
**description:**
Offset for $TC_DP4$: $TC_ECP54[t,d]$ comparable to $TC_DP13[t,d]$  
When the 'flat D number management' function is active, the syntax is as follows: $TC_ECP54[d]$  
**description of field limits:**
| t: T number | 1 - 32000 |
| d: Cutting edge number / D number | 1 - 32000 |
| **axis identifier:** | NCK version: 15.00.00 |
| **unit:** | run-in | main run | runin slip | Mrun syn | PP | SA | OPT | OEM | access rights |
| | mm | min.: | DBL_MIN | max.: | DBL_MAX |
| read: | X | X |
| write: | X | 7 |
| **attributes:** | global | block search | link |
| | Not classified | No restrictions |
### DOUBLE $TC_ECP55[32000,32000]$

<table>
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<tr>
<th>Description</th>
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<tbody>
<tr>
<td>Offset for $TC_DP5$: $TC_ECP55[t,d]$ comparable to $TC_DP14[t,d]$</td>
</tr>
<tr>
<td>When the 'flat D number management' function is active, the syntax is as follows: $TC_ECP55[d]$</td>
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</tbody>
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**description of field limits:**
- t: T number 1 - 32000
- d: Cutting edge number / D number 1 - 32000

**axis identifier:**
- NCK version: 15.00.00
- unit: mm
- run-in: 
- main run: 
- runin slp: 
- Mrun syn: 
- PP: 
- SA: 
- OPT: 
- OEM: 
- access rights: 

<table>
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<th>block search</th>
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<table>
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<th>run-in</th>
<th>main run</th>
<th>runin slp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
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### DOUBLE $TC_ECP56[32000,32000]$

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<tbody>
<tr>
<td>Offset for $TC_DP6$: $TC_ECP56[t,d]$ comparable to $TC_DP15[t,d]$</td>
</tr>
<tr>
<td>When the 'flat D number management' function is active, the syntax is as follows: $TC_ECP56[d]$</td>
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**description of field limits:**
- t: T number 1 - 32000
- d: Cutting edge number / D number 1 - 32000

**axis identifier:**
- NCK version: 15.00.00
- unit: mm
- run-in: 
- main run: 
- runin slp: 
- Mrun syn: 
- PP: 
- SA: 
- OPT: 
- OEM: 
- access rights: 

<table>
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SINUMERIK 840D sl/840Di sl/ 840D/ 840Di, List of System Variables (PGA1), 01/2008

1-320
### $TC_ECP57[32000,32000]$

<table>
<thead>
<tr>
<th>Description:</th>
<th>Offset for $TC_DP7$: $TC_ECP57[t,d]$ comparable to $TC_DP16[t,d]$</th>
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<table>
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<tbody>
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<tr>
<td>d: Cutting edge number / D number 1 - 32000</td>
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<td>Mrun syn</td>
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<tr>
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<td>OPT</td>
<td>OEM</td>
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<td>link</td>
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<td>No restrictions</td>
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### $TC_ECP58[32000,32000]$

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<th>Description:</th>
<th>Offset for $TC_DP8$: $TC_ECP58[t,d]$ comparable to $TC_DP17[t,d]$</th>
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<tr>
<td>When the 'flat D number management' function is active, the syntax is as follows: $TC_ECP58[d]$</td>
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<table>
<thead>
<tr>
<th>Description of field limits:</th>
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</thead>
<tbody>
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<td>t: T number 1 - 32000</td>
</tr>
<tr>
<td>d: Cutting edge number / D number 1 - 32000</td>
</tr>
</tbody>
</table>

<table>
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<th>NCK version:</th>
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<td>No restrictions</td>
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### DOUBLE $TC_ECP59[32000,32000]$

| Description: | Offset for $TC_DP9$: $TC_ECP59[t,d]$ comparable to $TC_DP18[t,d]$ | | |
| --- | --- | --- | |
| When the 'flat D number management' function is active, the syntax is as follows: | $TC_ECP59[d]$ | | |
| Description of field limits: | t: T number 1 - 32000 | d: Cutting edge number / D number 1 - 32000 | |
| Axis identifier: | | | |
| Unit: | mm | min.: | DBL_MIN | max.: | DBL_MAX | |
| run-in | main run | runin slp | Mrun syn | PP | SA | OPT | OEM | access rights | |
| read: | X | | | | | | | | |
| write: | | | | | | | | | |
| Attributes: | global | block search | link | Not classified | No restrictions | |

### DOUBLE $TC_ECP60[32000,32000]$

| Description: | Offset for $TC_DP10$: $TC_ECP60[t,d]$ comparable to $TC_DP19[t,d]$ | | |
| --- | --- | --- | |
| When the 'flat D number management' function is active, the syntax is as follows: | $TC_ECP60[d]$ | | |
| Description of field limits: | t: T number 1 - 32000 | d: Cutting edge number / D number 1 - 32000 | |
| Axis identifier: | | | |
| Unit: | - | min.: | DBL_MIN | max.: | DBL_MAX | |
| run-in | main run | runin slp | Mrun syn | PP | SA | OPT | OEM | access rights | |
| read: | X | | | | | | | | |
| write: | | | | | | | | | |
| Attributes: | global | block search | link | Not classified | No restrictions | | | | | |
### $TC_ECP61[32000,32000]$ Description:

Offset for $TC_DP11$: $TC_ECP61[t,d]$ comparable to $TC_DP20[t,d]$

When the 'flat D number management' function is active, the syntax is as follows: $TC_ECP61[d]$

**Description of Field Limits:**
- **t**: T number 1 - 32000
- **d**: Cutting edge number / D number 1 - 32000

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>Unit</th>
<th>Min.</th>
<th>Max.</th>
<th>NCK Version</th>
<th>Access Rights</th>
</tr>
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<tbody>
<tr>
<td>run-in</td>
<td>-</td>
<td>DBL_MIN</td>
<td>DBL_MAX</td>
<td>15.00.00</td>
<td>read: X, write: X</td>
</tr>
<tr>
<td>main run</td>
<td>-</td>
<td>DBL_MIN</td>
<td>DBL_MAX</td>
<td></td>
<td></td>
</tr>
<tr>
<td>run in slip</td>
<td>-</td>
<td>DBL_MIN</td>
<td>DBL_MAX</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mrun syn</td>
<td>-</td>
<td>DBL_MIN</td>
<td>DBL_MAX</td>
<td></td>
<td></td>
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<td>PP</td>
<td>-</td>
<td>DBL_MIN</td>
<td>DBL_MAX</td>
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<td>SA</td>
<td>-</td>
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<td>DBL_MAX</td>
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<td>-</td>
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<td>DBL_MAX</td>
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<td></td>
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</table>

**Attributes:**
- Global
- Block search
- Link

**Not classified**

### $TC_ECP63[32000,32000]$ Description:

Offset for $TC_DP3$: $TC_ECP63[t,d]$ comparable to $TC_DP12[t,d]$

When the 'flat D number management' function is active, the syntax is as follows: $TC_ECP63[d]$

**Description of Field Limits:**
- **t**: T number 1 - 32000
- **d**: Cutting edge number / D number 1 - 32000

<table>
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<th>Axis Identifier</th>
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<th>Max.</th>
<th>NCK Version</th>
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<td>DBL_MIN</td>
<td>DBL_MAX</td>
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<td>read: X, write: X</td>
</tr>
<tr>
<td>main run</td>
<td>mm</td>
<td>DBL_MIN</td>
<td>DBL_MAX</td>
<td></td>
<td></td>
</tr>
<tr>
<td>run in slip</td>
<td>mm</td>
<td>DBL_MIN</td>
<td>DBL_MAX</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mrun syn</td>
<td>mm</td>
<td>DBL_MIN</td>
<td>DBL_MAX</td>
<td></td>
<td></td>
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<tr>
<td>PP</td>
<td>mm</td>
<td>DBL_MIN</td>
<td>DBL_MAX</td>
<td></td>
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<tr>
<td>SA</td>
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<td>DBL_MAX</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OPT</td>
<td>mm</td>
<td>DBL_MIN</td>
<td>DBL_MAX</td>
<td></td>
<td></td>
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<tr>
<td>OEM</td>
<td>mm</td>
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<td>DBL_MAX</td>
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</tr>
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</table>

**Attributes:**
- Global
- Block search
- Link

**Not classified**

© Siemens AG 2008 All Rights Reserved
SINUMERIK 840D sl/840Di sl/ 840D/ 840Di, List of System Variables (PGA1), 01/2008
### $\textit{TC}_\text{ECP64}[32000,32000]$ (Offset for $\textit{TC}_\text{DP4}$)

<table>
<thead>
<tr>
<th>Description</th>
<th>Offset for $\textit{TC}<em>\text{DP4}$: $\textit{TC}</em>\text{ECP64}[t,d]$ comparable to $\textit{TC}_\text{DP13}[t,d]$</th>
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<tbody>
<tr>
<td>When the 'flat D number management' function is active, the syntax is as follows:</td>
<td>$\textit{TC}_\text{ECP64}[d]$</td>
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</table>

#### Description of Field Limits
- **t**: T number 1 - 32000
- **d**: Cutting edge number / D number 1 - 32000

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<td>DBL_MIN</td>
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<td>main run</td>
<td>runin slip</td>
<td>Mrun syn</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td></td>
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<td></td>
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<td>attributes:</td>
<td>global</td>
<td>block search</td>
<td>link</td>
</tr>
<tr>
<td>run-in main run runin slip Mrun syn PP SA OPT OEM access rights</td>
<td>7</td>
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<td>global</td>
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### $\textit{TC}_\text{ECP65}[32000,32000]$ (Offset for $\textit{TC}_\text{DP5}$)

<table>
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<th>Offset for $\textit{TC}<em>\text{DP5}$: $\textit{TC}</em>\text{ECP65}[t,d]$ comparable to $\textit{TC}_\text{DP14}[t,d]$</th>
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#### Description of Field Limits
- **t**: T number 1 - 32000
- **d**: Cutting edge number / D number 1 - 32000

<table>
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<tbody>
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<td>min.:</td>
<td>DBL_MIN</td>
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<tr>
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<td>main run</td>
<td>runin slip</td>
<td>Mrun syn</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
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</tr>
<tr>
<td>read:</td>
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</tr>
<tr>
<td>write:</td>
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</tbody>
</table>
### 1.8 Cutting edge data for OEM users

**DOUBLE $TC_ECP66[32000,32000]$**

**Description:**
Offset for $TC_DP6$: $TC_ECP66[t,d]$ comparable to $TC_DP15[t,d]$.

When the 'flat D number management' function is active, the syntax is as follows: $TC_ECP66[d]$.

**Description of field limits:**
- **t:** T number 1 - 32000
- **d:** Cutting edge number / D number 1 - 32000

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<th>max.</th>
<th>DBL_MAX</th>
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<td>mm</td>
<td>min.</td>
<td>DBL_MIN</td>
<td>max.</td>
<td>DBL_MAX</td>
</tr>
<tr>
<td>main run</td>
<td></td>
<td>runin slip</td>
<td>PP</td>
<td>SA</td>
<td>OPT</td>
<td>OME</td>
</tr>
<tr>
<td>read</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>write</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>Not classified</td>
<td>No restrictions</td>
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</table>

**DOUBLE $TC_ECP67[32000,32000]$**

**Description:**
Offset for $TC_DP7$: $TC_ECP67[t,d]$ comparable to $TC_DP16[t,d]$.

When the 'flat D number management' function is active, the syntax is as follows: $TC_ECP67[d]$.

**Description of field limits:**
- **t:** T number 1 - 32000
- **d:** Cutting edge number / D number 1 - 32000

<table>
<thead>
<tr>
<th>Axis Identifier</th>
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<th>unit</th>
<th>min.</th>
<th>DBL_MIN</th>
<th>max.</th>
<th>DBL_MAX</th>
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<td>mm</td>
<td>min.</td>
<td>DBL_MIN</td>
<td>max.</td>
<td>DBL_MAX</td>
</tr>
<tr>
<td>main run</td>
<td></td>
<td>runin slip</td>
<td>PP</td>
<td>SA</td>
<td>OPT</td>
<td>OME</td>
</tr>
<tr>
<td>read</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>write</td>
<td>X</td>
<td>X</td>
<td></td>
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<td></td>
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<tr>
<td>Attributes</td>
<td>global</td>
<td>block search</td>
<td>link</td>
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<tr>
<td></td>
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<td>No restrictions</td>
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</tr>
</tbody>
</table>
### Description of System Variables

#### $TC_ECP68[32000,32000]$ Description:
Offset for $TC_DP8$: $TC_ECP68[t,d]$ comparable to $TC_DP17[t,d]$

When the 'flat D number management' function is active, the syntax is as follows:

$TC_ECP68[d]$

**description of field limits:**
- **t:** T number 1 - 32000
- **d:** Cutting edge number / D number 1 - 32000

**Unit:** mm

**Access:**
- **read:** XX
- **write:** XX 7

**Attributes:**
- global
- block search
- link

**Not classified**

#### $TC_ECP69[32000,32000]$ Description:
Offset for $TC_DP9$: $TC_ECP69[t,d]$ comparable to $TC_DP18[t,d]$

When the 'flat D number management' function is active, the syntax is as follows:

$TC_ECP69[d]$

**description of field limits:**
- **t:** T number 1 - 32000
- **d:** Cutting edge number / D number 1 - 32000

**Unit:** mm

**Access:**
- **read:** XX
- **write:** XX 7

**Attributes:**
- global
- block search
- link

**Not classified**
### DOUBLE $TC_ECP70[32000,32000]$

<table>
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<tbody>
<tr>
<td>Offset for $TC_DP10$: $TC_ECP70[t,d]$ comparable to $TC_DP19[t,d]$</td>
</tr>
<tr>
<td>When the ‘flat D number management’ function is active, the syntax is as follows: $TC_ECP70[d]$</td>
</tr>
</tbody>
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#### Description of Field Limits:
- **t**: T number 1 - 32000
- **d**: Cutting edge number / D number 1 - 32000

<table>
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<th>Axis Identifier:</th>
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</thead>
<tbody>
<tr>
<td>Unit:</td>
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<td></td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>run-in slip</td>
</tr>
<tr>
<td>read: X</td>
<td>X</td>
<td>X</td>
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<td>write: X</td>
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<td>block search</td>
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<td>No restrictions</td>
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</table>

### DOUBLE $TC_ECP71[32000,32000]$

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<tbody>
<tr>
<td>Offset for $TC_DP11$: $TC_ECP71[t,d]$ comparable to $TC_DP20[t,d]$</td>
</tr>
<tr>
<td>When the ‘flat D number management’ function is active, the syntax is as follows: $TC_ECP71[d]$</td>
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#### Description of Field Limits:
- **t**: T number 1 - 32000
- **d**: Cutting edge number / D number 1 - 32000

<table>
<thead>
<tr>
<th>Axis Identifier:</th>
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</thead>
<tbody>
<tr>
<td>Unit:</td>
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<td></td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>run-in slip</td>
</tr>
<tr>
<td>read: X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write: X</td>
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<td>X</td>
</tr>
<tr>
<td>attributes: global</td>
<td>block search</td>
<td>link</td>
</tr>
<tr>
<td>Not classified</td>
<td>No restrictions</td>
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</tr>
</tbody>
</table>
### 1.9 Tool management monitoring data

#### $TC\_MOP1[32000,32000]$

- **Description:** $TC\_MOP1[t,d]$
- Prewarning limit for downtime
- **Description of field limits:**
  - t: T number 1 - 32000
  - d: Cutting edge number / D number 1 - 32000
- **Axis identifier:**
  - Axis identifier: NCK version: 06.00.00
  - Unit: -
  - Min.: 
  - Max.: DBL_MAX
- **Read:** X
- **Write:** X
- **Attributes:** global
- **Access:** block search
- **Access rights:** Not classified
- **Restrictions:** No restrictions

#### $TC\_MOP2[32000,32000]$

- **Description:** $TC\_MOP2[t,d]$
- Residual tool life
- **Description of field limits:**
  - t: T number 1 - 32000
  - d: Cutting edge number / D number 1 - 32000
- **Axis identifier:**
  - Axis identifier: NCK version: 06.00.00
  - Unit: -
  - Min.: 
  - Max.: DBL_MAX
- **Read:** X
- **Write:** X
- **Attributes:** global
- **Access:** block search
- **Access rights:** Not classified
- **Restrictions:** No restrictions
### $TC_MOP3[32000,32000]$

**Description:**
Prewarning limit for workpiece count

**Description of Field Limits:**
- **t:** T number 1 - 32000
- **d:** Cutting edge number / D number 1 - 32000

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<thead>
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<th>NCK Version</th>
<th>Unit</th>
<th>Min.</th>
<th>INT_MIN</th>
<th>Max.</th>
<th>INT_MAX</th>
<th>Run-In</th>
<th>Main Run</th>
<th>Runin Slp</th>
<th>Mrun Syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>Access Rights</th>
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**Read:**
- X

**Write:**
- X

**Attributes:**
- Global
- Block Search
- Link

**Access Rights:**
- Not classified
- No restrictions

---

### $TC_MOP4[32000,32000]$

**Description:**
Residual workpieces

**Description of Field Limits:**
- **t:** T number 1 - 32000
- **d:** Cutting edge number / D number 1 - 32000

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<th>INT_MIN</th>
<th>Max.</th>
<th>INT_MAX</th>
<th>Run-In</th>
<th>Main Run</th>
<th>Runin Slp</th>
<th>Mrun Syn</th>
<th>PP</th>
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<th>OPT</th>
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<th>Access Rights</th>
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</tbody>
</table>

**Read:**
- X

**Write:**
- X

**Attributes:**
- Global
- Block Search
- Link

**Access Rights:**
- Not classified
- No restrictions

---

### $TC_MOP5[32000,32000]$

**Description:**
Prewarning limit for wear

**Description of Field Limits:**
- **t:** T number 1 - 32000
- **d:** Cutting edge number / D number 1 - 32000

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<th>Unit</th>
<th>Min.</th>
<th>INT_MIN</th>
<th>Max.</th>
<th>DBL_MAX</th>
<th>Run-In</th>
<th>Main Run</th>
<th>Runin Slp</th>
<th>Mrun Syn</th>
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<th>OPT</th>
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<th>Access Rights</th>
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</table>

**Read:**
- X

**Write:**
- X

**Attributes:**
- Global
- Block Search
- Link

**Access Rights:**
- Not classified
- No restrictions
### System Variable List

**1.9 Tool Management Monitoring Data**

#### DOUBLE $TC_MOP6[32000,32000]$  
**Description:**  
Residual wear  
**Description of Field Limits:**  
- t: T number 1 - 32000  
- d: Cutting edge number / D number 1 - 32000  
**Axis Identifier:**  
NCK version: 15.00.00  
**Unit:** mm  
**Run-in** | **Main Run** | **Run In Slip** | **Mrun Syn** | **PP** | **SA** | **OPT** | **OEM** | **Access Rights**  
--- | --- | --- | --- | --- | --- | --- | --- | ---  
X | X |  
**Read:** X  
**Write:** X  
**Attributes:** Global  
Block Search  
Link  
**Classification:** Not classified  
**Access Restrictions:** No restrictions

#### DOUBLE $TC_MOP11[32000,32000]$  
**Description:**  
Specified tool life  
**Description of Field Limits:**  
- t: T number 1 - 32000  
- d: Cutting edge number / D number 1 - 32000  
**Axis Identifier:**  
NCK version: 15.00.00  
**Unit:** -  
**Run-in** | **Main Run** | **Run In Slip** | **Mrun Syn** | **PP** | **SA** | **OPT** | **OEM** | **Access Rights**  
--- | --- | --- | --- | --- | --- | --- | --- | ---  
X | X |  
**Read:** X  
**Write:** X  
**Attributes:** Global  
Block Search  
Link  
**Classification:** Not classified  
**Access Restrictions:** No restrictions

#### INT $TC_MOP13[32000,32000]$  
**Description:**  
Specified workpiece count  
**Description of Field Limits:**  
- t: T number 1 - 32000  
- d: Cutting edge number / D number 1 - 32000  
**Axis Identifier:**  
NCK version: 15.00.00  
**Unit:** INT  
**Run-in** | **Main Run** | **Run In Slip** | **Mrun Syn** | **PP** | **SA** | **OPT** | **OEM** | **Access Rights**  
--- | --- | --- | --- | --- | --- | --- | --- | ---  
X | X |  
**Read:** X  
**Write:** X  
**Attributes:** Global  
Block Search  
Link  
**Classification:** Not classified  
**Access Restrictions:** No restrictions
### DOUBLE $TC_MOP15[32000,32000]$  
**description:**

$TC_MOP15[t,d]$  
Specified wear  

description of field limits:  
t: T number 1 - 32000  
d: Cutting edge number / D number 1 - 32000  

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<td>main run</td>
<td>runin stp</td>
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<tr>
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### INT $TC_MOPC1[32000,32000]$  
**description:**

The type can be specified by machine data. INT is the default setting  

$TC_MOPC1[t,d]$  

description of field limits:  
t: T number 1 - 32000  
d: Cutting edge number / D number 1 - 32000  

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<td>main run</td>
<td>runin stp</td>
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<td>read: X</td>
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<td>t: T number 1 - 32000</td>
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<td></td>
<td>d: Cutting edge number / D number 1 - 32000</td>
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<td><strong>Axis identifier:</strong></td>
<td>NCK version: 06.00.00</td>
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<tr>
<td><strong>Unit:</strong></td>
<td>run-in</td>
</tr>
<tr>
<td><strong>Read:</strong></td>
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<tr>
<td><strong>Write:</strong></td>
<td>X</td>
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<tr>
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### $TC_MOPC6[32000,32000]$

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<td>d: Cutting edge number / D number 1 - 32000</td>
</tr>
<tr>
<td><strong>Axis identifier:</strong></td>
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<tr>
<td><strong>Unit:</strong></td>
<td>run-in</td>
</tr>
<tr>
<td><strong>Read:</strong></td>
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</tr>
<tr>
<td><strong>Write:</strong></td>
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<tr>
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<td>d: Cutting edge number / D number 1 - 32000</td>
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<td><strong>Axis identifier:</strong></td>
<td>NCK version: 06.00.00</td>
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<tr>
<td><strong>Unit:</strong></td>
<td>run-in</td>
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<td><strong>Write:</strong></td>
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### $TC_MOPC8[32000,32000]$ Description:
The type can be specified by machine data. INT is the default setting.

**Access Rights:**
- Read: XX
- Write: XX 7

**Attributes:**
- Global
- Block Search
- Link

**Not classified, no restrictions**

### $TC_MOPC9[32000,32000]$ Description:
The type can be specified by machine data. INT is the default setting.

**Access Rights:**
- Read: XX
- Write: XX 7

**Attributes:**
- Global
- Block Search
- Link

**Not classified, no restrictions**

### $TC_MOPC10[32000,32000]$ Description:
The type can be specified by machine data. INT is the default setting.

**Access Rights:**
- Read: XX
- Write: XX 7

**Attributes:**
- Global
- Block Search
- Link

**Not classified, no restrictions**
### 1.10 OEM user monitoring data

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<td>$TC_MOPCS2[32000,32000]$</td>
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<td>$TC_MOPCS3[32000,32000]$</td>
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<tr>
<td>run-in</td>
<td>main run</td>
<td>runin slip</td>
</tr>
<tr>
<td>read</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
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**Description:**
The type can be specified by machine data. INT is the default setting.

**$TC_MOPCS4[t,d]$**

**Description of Field Limits:**
- **t:** T number 1 - 32000
- **d:** Cutting edge number / D number 1 - 32000

**Axis Identifier:**
- NCK version: 18.00.00

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<th>INT_MAX</th>
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<th>main run</th>
<th>runin slip</th>
<th>Mrun syn</th>
<th>PP</th>
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**Attributes:**
- global
- block search
- link

**Access Rights:**
- Not classified
- No restrictions

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### $TC_MOPCS5[32000,32000]$

**Description:**
The type can be specified by machine data. INT is the default setting.

**$TC_MOPCS5[t,d]$**

**Description of Field Limits:**
- **t:** T number 1 - 32000
- **d:** Cutting edge number / D number 1 - 32000

**Axis Identifier:**
- NCK version: 18.00.00

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**Attributes:**
- global
- block search
- link

**Access Rights:**
- Not classified
- No restrictions

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### $TC_MOPCS6[32000,32000]$

**Description:**
The type can be specified by machine data. INT is the default setting.

**$TC_MOPCS6[t,d]$**

**Description of Field Limits:**
- **t:** T number 1 - 32000
- **d:** Cutting edge number / D number 1 - 32000

**Axis Identifier:**
- NCK version: 18.00.00

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<th>main run</th>
<th>runin slip</th>
<th>Mrun syn</th>
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**Attributes:**
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**Access Rights:**
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- No restrictions
### 1.10 OEM user monitoring data

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d: Cutting edge number / D number 1 - 32000 |
| $TC\_MOPCS8[t,d]$ | t: T number 1 - 32000  
d: Cutting edge number / D number 1 - 32000 |
| $TC\_MOPCS9[t,d]$ | t: T number 1 - 32000  
d: Cutting edge number / D number 1 - 32000 |

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<th>Mrun syn</th>
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SINUMERIK 840D sl/840Di sl/ 840D/ 840Di, List of System Variables (PGA1), 01/2008
### 1.11 Tool-related data

#### INT

$\textit{TC\_MOPCS10}\[32000,32000\]$

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attributes: global block search link

Not classified No restrictions

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#### STRING

$\textit{TC\_TP2}\[32000\]$

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attributes: global block search link

Not classified No restrictions
1.11 Tool-related data

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<td>runin slp</td>
<td>Mrun syn</td>
<td>PP</td>
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<td>unit:</td>
<td>-</td>
<td>min.:</td>
<td>INT_MIN</td>
<td>max.:</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin slp</td>
<td>Mrun syn</td>
<td>PP</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
<td>link</td>
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<tr>
<td>Not classified</td>
<td>No restrictions</td>
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</table>
### System variable

1.11 Tool-related data

#### $TC_TP5[32000]$

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$TC_TP5[t]$</td>
</tr>
<tr>
<td>Size at top</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Description of field limits:</th>
</tr>
</thead>
<tbody>
<tr>
<td>t: T number 1 - 32000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Axis identifier:</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCK version:</td>
</tr>
<tr>
<td>06.00.00</td>
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<table>
<thead>
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<th>Unit:</th>
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<tr>
<td>INT_MIN</td>
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<tr>
<td>INT_MAX</td>
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<table>
<thead>
<tr>
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<th>Main run</th>
<th>Runin slip</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>Access rights</th>
</tr>
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<tr>
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<td></td>
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<td>write:</td>
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<td>X</td>
<td></td>
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<tr>
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<tr>
<td>block search</td>
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<tr>
<td>link</td>
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</tbody>
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<table>
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#### $TC_TP6[32000]$

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</table>

<table>
<thead>
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</tr>
</thead>
<tbody>
<tr>
<td>t: T number 1 - 32000</td>
</tr>
</tbody>
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<table>
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<tbody>
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<td>NCK version:</td>
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<table>
<thead>
<tr>
<th>Unit:</th>
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<tr>
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<tr>
<td>INT_MAX</td>
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<thead>
<tr>
<th>Run-in</th>
<th>Main run</th>
<th>Runin slip</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>Access rights</th>
</tr>
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<td>X</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<table>
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<th>Attributes:</th>
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<td>block search</td>
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<tr>
<td>link</td>
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</tbody>
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#### $TC_TP7[32000]$

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<table>
<thead>
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<th>Axis identifier:</th>
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<tbody>
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<tr>
<td>06.00.00</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit:</th>
</tr>
</thead>
<tbody>
<tr>
<td>INT_MIN</td>
</tr>
<tr>
<td>INT_MAX</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Run-in</th>
<th>Main run</th>
<th>Runin slip</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>Access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td>7</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Attributes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>global</td>
</tr>
<tr>
<td>block search</td>
</tr>
<tr>
<td>link</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rights:</th>
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<tbody>
<tr>
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<tr>
<td>No restrictions</td>
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</tbody>
</table>
### 1.11 Tool-related data

#### $TC_TP8[32000]$

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
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<tr>
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<td>Status</td>
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</table>

**description of field limits:**

- **t**: T number 1 - 32000

**axis identifier:**

<table>
<thead>
<tr>
<th>run-in</th>
<th>main run</th>
<th>runin stp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**unit:**

- **run-in**: INT_MIN
- **main run**: INT_MAX
- **runin stp**: INT_MIN
- **Mrun syn**: INT_MAX
- **PP**: INT_MIN
- **SA**: INT_MAX
- **OPT**: INT_MIN
- **OEM**: INT_MAX
- **access rights**: INT_MIN

**read:**

- **X**: INT_MIN

**write:**

- **X**: INT_MAX

**attributes:**

- **global**: INT_MIN
- **block search**: INT_MAX
- **link**: INT_MIN

**Not classified**: INT_MIN

**No restrictions**: INT_MAX

#### $TC_TP9[32000]$

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>$TC_TP9[t]$</td>
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<td>Type of tool monitoring</td>
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</table>

**description of field limits:**

- **t**: T number 1 - 32000

**axis identifier:**

<table>
<thead>
<tr>
<th>run-in</th>
<th>main run</th>
<th>runin stp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**unit:**

- **run-in**: INT_MIN
- **main run**: INT_MAX
- **runin stp**: INT_MIN
- **Mrun syn**: INT_MAX
- **PP**: INT_MIN
- **SA**: INT_MAX
- **OPT**: INT_MIN
- **OEM**: INT_MAX
- **access rights**: INT_MIN

**read:**

- **X**: INT_MIN

**write:**

- **X**: INT_MAX

**attributes:**

- **global**: INT_MIN
- **block search**: INT_MAX
- **link**: INT_MIN

**Not classified**: INT_MIN

**No restrictions**: INT_MAX

#### $TC_TP11[32000]$

<table>
<thead>
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</tr>
</thead>
<tbody>
<tr>
<td>$TC_TP11[t]$</td>
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<td>Replacement-change strategy</td>
</tr>
</tbody>
</table>

**description of field limits:**

- **t**: T number 1 - 32000

**axis identifier:**

<table>
<thead>
<tr>
<th>run-in</th>
<th>main run</th>
<th>runin stp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**unit:**

- **run-in**: INT_MIN
- **main run**: INT_MAX
- **runin stp**: INT_MIN
- **Mrun syn**: INT_MAX
- **PP**: INT_MIN
- **SA**: INT_MAX
- **OPT**: INT_MIN
- **OEM**: INT_MAX
- **access rights**: INT_MIN

**read:**

- **X**: INT_MIN

**write:**

- **X**: INT_MAX

**attributes:**

- **global**: INT_MIN
- **block search**: INT_MAX
- **link**: INT_MIN

**Not classified**: INT_MIN

**No restrictions**: INT_MAX
### $TC_TP10[32000]$  
**Description:**
Tool info  
**Description of Field Limits:**
- **t:** T number 1 - 32000  
- **Unit:** INT_MIN, INT_MAX  
- **Access Rights:**
  - **Read:** X  
  - **Write:** X

### $TC_TP_PROTA[32000]$  
**Description:**
Name of the 3-dimensional protection area for the tool, or the name of the file containing the description of the protection area for the tool.  
**Description of Field Limits:**
- **t:** T number 1 - 32000  
- **Unit:** INT_MIN, INT_MAX  
- **Access Rights:**
  - **Read:** X  
  - **Write:** X

### $TC_TP_MAX_VELO[32000]$  
**Description:**
Maximum speed of the tool when the value is >0. There is no monitoring if a speed limit has not been defined (=0).  
**Description of Field Limits:**
- **t:** T number 1 - 32000  
- **Unit:** rpm, DBL_MAX  
- **Access Rights:**
  - **Read:** X  
  - **Write:** X
### Tool-related data

**DOUBLE** $\text{TTC_TP_MAX_ACC}[32000]$  

<table>
<thead>
<tr>
<th>Description</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>$\text{TTC_TP_MAX_ACC}[t]$</td>
<td>Maximum acceleration of the tool when the value is &gt;0. There is no monitoring if an acceleration limit has not been defined (=0).</td>
</tr>
</tbody>
</table>

**Description of field limits:**

- t: T number 1 - 32000
- NCK version: 72.00.00
- Unit: rps²
- Minimum: 0
- Maximum: DBL_MAX
- Run-in: main run
- Main Syn: run-in
- PP: SA
- Access rights: OEM
- Read: X
- Write: X
- Attributes: global block search

**DOUBLE** $\text{TTC_TPC1}[32000]$  

<table>
<thead>
<tr>
<th>Description</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>$\text{TTC_TPC1}[t]$</td>
<td>The type can be specified by machine data. INT is the default setting</td>
</tr>
</tbody>
</table>

**Description of field limits:**

- t: T number 1 - 32000
- NCK version: 06.00.00
- Unit: -
- Minimum: DBL_MIN
- Maximum: DBL_MAX
- Run-in: main run
- Main Syn: run-in
- PP: SA
- Access rights: OEM
- Read: X
- Write: X
- Attributes: global block search

**DOUBLE** $\text{TTC_TPC2}[32000]$  

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<th>Description</th>
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</thead>
<tbody>
<tr>
<td>$\text{TTC_TPC2}[t]$</td>
<td>The type can be specified by machine data. INT is the default setting</td>
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</tbody>
</table>

**Description of field limits:**

- t: T number 1 - 32000
- NCK version: 06.00.00
- Unit: -
- Minimum: DBL_MIN
- Maximum: DBL_MAX
- Run-in: main run
- Main Syn: run-in
- PP: SA
- Access rights: OEM
- Read: X
- Write: X
- Attributes: global block search
### $TC_TPC3[32000]$ Description

The type can be specified by machine data. INT is the default setting.

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<th>Description of Field Limits</th>
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<tr>
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<table>
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<tr>
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<th>NCK Version</th>
<th>Unit</th>
<th>Min.</th>
<th>Max.</th>
<th>Run-in</th>
<th>Main Run</th>
<th>Run-in Slip</th>
<th>Mrun Syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<table>
<thead>
<tr>
<th>Read</th>
<th>Write</th>
<th>Attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
<td>global</td>
</tr>
</tbody>
</table>

| Not classified | No restrictions |

### $TC_TPC4[32000]$ Description

The type can be specified by machine data. INT is the default setting.

<table>
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<th>Description of Field Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>$t$: T number 1 - 32000</td>
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<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>NCK Version</th>
<th>Unit</th>
<th>Min.</th>
<th>Max.</th>
<th>Run-in</th>
<th>Main Run</th>
<th>Run-in Slip</th>
<th>Mrun Syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
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<table>
<thead>
<tr>
<th>Read</th>
<th>Write</th>
<th>Attributes</th>
</tr>
</thead>
<tbody>
<tr>
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| Not classified | No restrictions |

### $TC_TPC5[32000]$ Description

The type can be specified by machine data. INT is the default setting.

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<table>
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<th>NCK Version</th>
<th>Unit</th>
<th>Min.</th>
<th>Max.</th>
<th>Run-in</th>
<th>Main Run</th>
<th>Run-in Slip</th>
<th>Mrun Syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>Access Rights</th>
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<table>
<thead>
<tr>
<th>Read</th>
<th>Write</th>
<th>Attributes</th>
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</thead>
<tbody>
<tr>
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| Not classified | No restrictions |
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</tr>
<tr>
<td>t: T number 1 - 32000</td>
<td></td>
</tr>
<tr>
<td>Axis identifier:</td>
<td>NCK version: 06.00.00</td>
</tr>
<tr>
<td>Unit:</td>
<td>min.: DBL_MIN</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
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<tr>
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### $TC\_TPC7[32000]$

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<td></td>
</tr>
<tr>
<td>Axis identifier:</td>
<td>NCK version: 06.00.00</td>
</tr>
<tr>
<td>Unit:</td>
<td>min.: DBL_MIN</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
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### $TC\_TPC8[32000]$

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<tr>
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</tr>
<tr>
<td>Axis identifier:</td>
<td>NCK version: 06.00.00</td>
</tr>
<tr>
<td>Unit:</td>
<td>min.: DBL_MIN</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
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<tr>
<td>Attributes:</td>
<td>global</td>
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</table>
### $TC_TPC9[32000]$

<table>
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<td>Main run</td>
</tr>
<tr>
<td></td>
<td>min.:</td>
<td>run-in</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
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<tr>
<td>write:</td>
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<tr>
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<td>Main run</td>
</tr>
<tr>
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</tr>
<tr>
<td>read:</td>
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These tables provide information about the system variables within the SINUMERIK 840D sl/840Di sl/ 840D/ 840D system, including their descriptions, field limits, access rights, and attributes.
### 1.11 Tool-related data

#### DOUBLE $SC_TPCS2[32000]$

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<th>Runin slip</th>
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**description:**
The type can be specified by machine data. INT is the default setting

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**description of field limits:**
t: T number 1 - 32000

**axis identifier:**

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<th>Mrun syn</th>
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**attributes:**
- global
- block
- search
- link

**Not classified**
**No restrictions**

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**DOUBLE $TC_TPCS6[32000]$**

**description:**
The type can be specified by machine data. INT is the default setting

**$TC_TPCS6[t]$**

**description of field limits:**
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**axis identifier:**

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**attributes:**
- global
- block
- search
- link

**Not classified**
**No restrictions**

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**description:**
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**$TC_TPCS7[t]$**

**description of field limits:**
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**axis identifier:**

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- block
- search
- link

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## 1.12 Tool-related grinding data

### INT \( $TC_TPG1[32000] \)

**Description:**

\( $TC_TPG1[t] \)

Spindle number

**Description of Field Limits:**

\( t: \) T number 1 - 32000

**Axis Identifier:**

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**Unit:** INT_MIN

**Min.:** INT_MIN

**Max.:** INT_MAX

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**Attributes:**

- Global
- Block search
- Link

**Access Rights:**

- Not classified
- No restrictions

### INT \( $TC_TPG2[32000] \)

**Description:**

\( $TC_TPG2[t] \)

Chaining rule

**Description of Field Limits:**

\( t: \) T number 1 - 32000

**Axis Identifier:**

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**Min.:** INT_MIN

**Max.:** INT_MAX

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**Attributes:**

- Global
- Block search
- Link

**Access Rights:**

- Not classified
- No restrictions

### DOUBLE \( $TC_TPG3[32000] \)

**Description:**

\( $TC_TPG3[t] \)

Minimum grinding wheel radius

**Description of Field Limits:**

\( t: \) T number 1 - 32000

**Axis Identifier:**

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**Unit:** DBL_MIN

**Min.:** DBL_MIN

**Max.:** DBL_MAX

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<th>main run</th>
<th>runin stp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
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<td></td>
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</tr>
</tbody>
</table>

**Write:**

<table>
<thead>
<tr>
<th>run-in</th>
<th>main run</th>
<th>runin stp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

**Attributes:**

- Global
- Block search
- Link

**Access Rights:**

- Not classified
- No restrictions
### 1.12 Tool-related grinding data

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
<th>NCK version</th>
<th>Unit</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>$TC_TPG4[32000]$</td>
<td>Minimum grinding wheel width</td>
<td>06.00.00</td>
<td>mm   DBL_MAX</td>
<td>X   X</td>
<td>X   X</td>
<td>read: XX X   write: XX X 7   attributes: global block search link</td>
</tr>
<tr>
<td>$TC_TPG5[32000]$</td>
<td>Current grinding wheel width</td>
<td>06.00.00</td>
<td>mm   DBL_MAX</td>
<td>X   X</td>
<td>X   X</td>
<td>read: XX X   write: XX X 7   attributes: global block search link</td>
</tr>
<tr>
<td>$TC_TPG6[32000]$</td>
<td>Maximum speed</td>
<td>06.00.00</td>
<td>mm   DBL_MAX</td>
<td>X   X</td>
<td>X   X</td>
<td>read: XX X   write: XX X 7   attributes: global block search link</td>
</tr>
</tbody>
</table>
### DOUBLE $TC_TPG7[32000]$

<table>
<thead>
<tr>
<th>Description</th>
<th>Field Limits</th>
<th>Access Rights</th>
<th>Attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. peripheral speed</td>
<td>$TC_TPG7[t]$</td>
<td>DBL_MAX</td>
<td>global, block, search, link</td>
</tr>
<tr>
<td>t: T number 1 - 32000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Description:</td>
<td></td>
<td></td>
<td>Not classified, No restrictions</td>
</tr>
<tr>
<td>NCK version:</td>
<td>06.00.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unit: m/sec</td>
<td>run-in min.: min.:</td>
<td>main run, runin stp, Mrun syn, PP, SA, OPT, OEM</td>
<td>read: X, write: X</td>
</tr>
<tr>
<td></td>
<td>max.:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### DOUBLE $TC_TPG8[32000]$

<table>
<thead>
<tr>
<th>Description</th>
<th>Field Limits</th>
<th>Access Rights</th>
<th>Attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angle of inclined grinding wheel</td>
<td>$TC_TPG8[t]$</td>
<td></td>
<td>global, block, search, link</td>
</tr>
<tr>
<td>t: T number 1 - 32000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Description:</td>
<td></td>
<td></td>
<td>Not classified, No restrictions</td>
</tr>
<tr>
<td>NCK version:</td>
<td>06.00.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unit:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>run-in min.: min.:</td>
<td>main run, runin stp, Mrun syn, PP, SA, OPT, OEM</td>
<td>read: X, write: X</td>
</tr>
<tr>
<td></td>
<td>max.:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### INT $TC_TPG9[32000]$

<table>
<thead>
<tr>
<th>Description</th>
<th>Field Limits</th>
<th>Access Rights</th>
<th>Attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parameter no. f. radius calculation</td>
<td>$TC_TPG9[t]$</td>
<td></td>
<td>global, block, search, link</td>
</tr>
<tr>
<td>t: T number 1 - 32000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Description:</td>
<td></td>
<td></td>
<td>Not classified, No restrictions</td>
</tr>
<tr>
<td>NCK version:</td>
<td>06.00.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unit:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>run-in min.: min.:</td>
<td>main run, runin stp, Mrun syn, PP, SA, OPT, OEM</td>
<td>read: X, write: X</td>
</tr>
<tr>
<td></td>
<td>max.:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# 1.13 Magazine location data

**BOOL $TC\_MPP3[32000,32000]$**

<table>
<thead>
<tr>
<th>Description:</th>
<th>$TC_MPP3[n,m]$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consider adjacent location On/Off</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description of field limits:</th>
</tr>
</thead>
<tbody>
<tr>
<td>n: Physical magazine number</td>
</tr>
<tr>
<td>m: Physical location number</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Axis identifier:</th>
<th>NCK version: 06.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>main run</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
</tr>
<tr>
<td>Attributes:</td>
<td>global</td>
</tr>
<tr>
<td>Not classified</td>
<td>No restrictions</td>
</tr>
</tbody>
</table>

**INT $TC\_MPP1[32000,32000]$**

<table>
<thead>
<tr>
<th>Description:</th>
<th>$TC_MPP1[n,m]$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location type</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description of field limits:</th>
</tr>
</thead>
<tbody>
<tr>
<td>n: Physical magazine number</td>
</tr>
<tr>
<td>m: Physical location number</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Axis identifier:</th>
<th>NCK version: 06.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>main run</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
</tr>
<tr>
<td>Attributes:</td>
<td>global</td>
</tr>
<tr>
<td>Not classified</td>
<td>No restrictions</td>
</tr>
</tbody>
</table>
### $TC_MPP2[n,m]$ 
**Location type**

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>n</strong></td>
<td>Physical magazine number</td>
</tr>
<tr>
<td><strong>m</strong></td>
<td>Physical location number</td>
</tr>
</tbody>
</table>

**Description of field limits:**

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>n</strong></td>
<td>Physical magazine number</td>
</tr>
<tr>
<td><strong>m</strong></td>
<td>Physical location number</td>
</tr>
</tbody>
</table>

**Axis identifier:**

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>INT_MAX</td>
<td>Run-in</td>
<td></td>
</tr>
<tr>
<td>INT_MAX</td>
<td>Main run</td>
<td></td>
</tr>
<tr>
<td>INT_MAX</td>
<td>Run-in slp</td>
<td></td>
</tr>
<tr>
<td>INT_MAX</td>
<td>Mrun syn</td>
<td></td>
</tr>
<tr>
<td>INT_MAX</td>
<td>PP</td>
<td></td>
</tr>
<tr>
<td>INT_MAX</td>
<td>SA</td>
<td></td>
</tr>
<tr>
<td>INT_MAX</td>
<td>OPT</td>
<td></td>
</tr>
<tr>
<td>INT_MAX</td>
<td>OEM</td>
<td></td>
</tr>
<tr>
<td>INT_MAX</td>
<td>Access</td>
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</tr>
</tbody>
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**Rights:**

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>read</td>
<td>XX</td>
<td></td>
</tr>
<tr>
<td>write</td>
<td>XX 7</td>
<td></td>
</tr>
</tbody>
</table>

**Attributes:**

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<th>Field</th>
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<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>global</td>
<td>Block search</td>
<td></td>
</tr>
<tr>
<td>link</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Access:**

- Not classified
- No restrictions

---

### $TC_MPP6[n,m]$ 
**Location type**

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>n</strong></td>
<td>Physical magazine number</td>
</tr>
<tr>
<td><strong>m</strong></td>
<td>Physical location number</td>
</tr>
</tbody>
</table>

**Description of field limits:**

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>n</strong></td>
<td>Physical magazine number</td>
</tr>
<tr>
<td><strong>m</strong></td>
<td>Physical location number</td>
</tr>
</tbody>
</table>

**Axis identifier:**

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>INT_MAX</td>
<td>Run-in</td>
<td></td>
</tr>
<tr>
<td>INT_MAX</td>
<td>Main run</td>
<td></td>
</tr>
<tr>
<td>INT_MAX</td>
<td>Run-in slp</td>
<td></td>
</tr>
<tr>
<td>INT_MAX</td>
<td>Mrun syn</td>
<td></td>
</tr>
<tr>
<td>INT_MAX</td>
<td>PP</td>
<td></td>
</tr>
<tr>
<td>INT_MAX</td>
<td>SA</td>
<td></td>
</tr>
<tr>
<td>INT_MAX</td>
<td>OPT</td>
<td></td>
</tr>
<tr>
<td>INT_MAX</td>
<td>OEM</td>
<td></td>
</tr>
<tr>
<td>INT_MAX</td>
<td>Access</td>
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</table>

**Rights:**

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<thead>
<tr>
<th>Field</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>read</td>
<td>XX</td>
<td></td>
</tr>
<tr>
<td>write</td>
<td>XX 7</td>
<td></td>
</tr>
</tbody>
</table>

**Attributes:**

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>global</td>
<td>Block search</td>
<td></td>
</tr>
<tr>
<td>link</td>
<td></td>
<td></td>
</tr>
</tbody>
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**Access:**

- Not classified
- No restrictions

---

### $TC_MPP4[n,m]$ 
**Location type**

<table>
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<tbody>
<tr>
<td><strong>n</strong></td>
<td>Physical magazine number</td>
</tr>
<tr>
<td><strong>m</strong></td>
<td>Physical location number</td>
</tr>
</tbody>
</table>

**Description of field limits:**

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>n</strong></td>
<td>Physical magazine number</td>
</tr>
<tr>
<td><strong>m</strong></td>
<td>Physical location number</td>
</tr>
</tbody>
</table>

**Axis identifier:**

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>INT_MAX</td>
<td>Run-in</td>
<td></td>
</tr>
<tr>
<td>INT_MAX</td>
<td>Main run</td>
<td></td>
</tr>
<tr>
<td>INT_MAX</td>
<td>Run-in slp</td>
<td></td>
</tr>
<tr>
<td>INT_MAX</td>
<td>Mrun syn</td>
<td></td>
</tr>
<tr>
<td>INT_MAX</td>
<td>PP</td>
<td></td>
</tr>
<tr>
<td>INT_MAX</td>
<td>SA</td>
<td></td>
</tr>
<tr>
<td>INT_MAX</td>
<td>OPT</td>
<td></td>
</tr>
<tr>
<td>INT_MAX</td>
<td>OEM</td>
<td></td>
</tr>
<tr>
<td>INT_MAX</td>
<td>Access</td>
<td></td>
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**Rights:**

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>read</td>
<td>XX</td>
<td></td>
</tr>
<tr>
<td>write</td>
<td>XX 7</td>
<td></td>
</tr>
</tbody>
</table>

**Attributes:**

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>global</td>
<td>Block search</td>
<td></td>
</tr>
<tr>
<td>link</td>
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<td></td>
</tr>
</tbody>
</table>

**Access:**

- Not classified
- No restrictions
### 1.13 Magazine location data

<table>
<thead>
<tr>
<th>INT</th>
<th>$TC_MPP5[32000,32000]$</th>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$TC_MPP5[n,m]$</td>
<td>Buffer magazine: Location type index</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Real magazines: Wear group number</td>
</tr>
<tr>
<td>description of field limits:</td>
<td>n: Physical magazine number</td>
<td></td>
</tr>
<tr>
<td></td>
<td>m: Physical location number</td>
<td></td>
</tr>
<tr>
<td>axis identifier:</td>
<td>unit: INT</td>
<td></td>
</tr>
<tr>
<td></td>
<td>min.: INT_MAX</td>
<td>max.: INT_MAX</td>
</tr>
<tr>
<td></td>
<td>run-in main run runin slip Mrun syn PP SA OPT OEM access rights</td>
<td>read: X</td>
</tr>
<tr>
<td></td>
<td>write: X</td>
<td>attributes: global block search link</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Not classified No restrictions</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>INT</th>
<th>$TC_MPP7[32000,32000]$</th>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$TC_MPP7[n,m]$</td>
<td>Adapter number of tool adapter in this location</td>
</tr>
<tr>
<td>description of field limits:</td>
<td>n: Physical magazine number</td>
<td></td>
</tr>
<tr>
<td></td>
<td>m: Physical location number</td>
<td></td>
</tr>
<tr>
<td>axis identifier:</td>
<td>unit: INT</td>
<td></td>
</tr>
<tr>
<td></td>
<td>min.: INT_MAX</td>
<td>max.: INT_MAX</td>
</tr>
<tr>
<td></td>
<td>run-in main run runin slip Mrun syn PP SA OPT OEM access rights</td>
<td>read: X</td>
</tr>
<tr>
<td></td>
<td>write: X</td>
<td>attributes: global block search link</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Not classified No restrictions</td>
</tr>
</tbody>
</table>
### 1.13 Magazine location data

**$TC_MPP66[n,m]$**

**Description:**
T no. of tool stored in buffer for which the location defined by n,m is reserved.

A write operation is meaningful only when a backup file is loaded to the NCK.

The name assignment is based on $TC_MPP6 - T$ no. of tool stored in the magazine location.

**Description of field limits:**
- **n**: Physical magazine number
- **m**: Physical location number

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>NCK version:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>43.00.00</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>run-in</th>
<th>main run</th>
<th>runin slp</th>
<th>M run syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>read:</th>
<th>write:</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>attributes:</th>
<th>global</th>
<th>block search</th>
<th>link</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Not classified</th>
<th>No restrictions</th>
</tr>
</thead>
</table>

**$TC_MPP_SP[n,m]$**

**Description:**

Only of significance if:
- Working with tool holders ($MC_TOOLHOLDER_MANAGEMENT > 0$)
- The magazine location "m" belongs to a buffer magazine "n"
- The magazine location describes a tool holder ($TC_MPP1[n,m]=2$)

In this case, the system variable contains the spindle number whose speed is to be monitored for the maximum tool speed.

When not working with tool holders ($MC_TOOLHOLDER_MANAGEMENT = 0$), the variable contains the value of the spindle index from $TC_MPP5$.

This variable contains the value =0 if the magazine location "n,m" is not a buffer magazine location for a spindle or tool holder.

**Description of field limits:**
- **n**: Physical magazine number
- **m**: Physical location number

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>NCK version:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>72.00.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>run-in</th>
<th>main run</th>
<th>runin slp</th>
<th>M run syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>read:</th>
<th>write:</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>attributes:</th>
<th>global</th>
<th>block search</th>
<th>link</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Not classified</th>
<th>No restrictions</th>
</tr>
</thead>
</table>
### Magazine location data for OEM users

**INT $TC\_MPPC1[32000,32000]$**

<table>
<thead>
<tr>
<th>Description:</th>
<th>The type can be specified by machine data. INT is the default setting</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>n</strong>: Physical magazine number</td>
<td></td>
</tr>
<tr>
<td><strong>m</strong>: Physical location number</td>
<td></td>
</tr>
<tr>
<td><strong>axis identifier</strong>:</td>
<td>NCK version: 06.00.00</td>
</tr>
<tr>
<td><strong>unit</strong>:</td>
<td>-</td>
</tr>
<tr>
<td><strong>min.</strong>:</td>
<td>INT_MIN</td>
</tr>
<tr>
<td><strong>max.</strong>:</td>
<td>INT_MAX</td>
</tr>
<tr>
<td><strong>read</strong>:</td>
<td>X</td>
</tr>
<tr>
<td><strong>write</strong>:</td>
<td>X</td>
</tr>
<tr>
<td><strong>attributes</strong>:</td>
<td>Not classified</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>INT $TC_MPPC2[32000,32000]$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description:</td>
</tr>
<tr>
<td><strong>n</strong>: Physical magazine number</td>
</tr>
<tr>
<td><strong>m</strong>: Physical location number</td>
</tr>
<tr>
<td><strong>axis identifier</strong>:</td>
</tr>
<tr>
<td><strong>unit</strong>:</td>
</tr>
<tr>
<td><strong>min.</strong>:</td>
</tr>
<tr>
<td><strong>max.</strong>:</td>
</tr>
<tr>
<td><strong>read</strong>:</td>
</tr>
<tr>
<td><strong>write</strong>:</td>
</tr>
<tr>
<td><strong>attributes</strong>:</td>
</tr>
</tbody>
</table>
### INT $TC_MPPC3[32000,32000]$

**description:**
The type can be specified by machine data. INT is the default setting.

**$TC_MPPC3[n,m]$**

**description of field limits:**
- **n:** Physical magazine number
- **m:** Physical location number

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>NCK version:</th>
<th>06.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit</td>
<td>min.: INT_MIN</td>
<td>max.: INT_MAX</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin slip</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

**attributes:**
- global
- block search
- link
- Not classified
- No restrictions

### INT $TC_MPPC4[32000,32000]$

**description:**
The type can be specified by machine data. INT is the default setting.

**$TC_MPPC4[n,m]$**

**description of field limits:**
- **n:** Physical magazine number
- **m:** Physical location number

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>NCK version:</th>
<th>06.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit</td>
<td>min.: INT_MIN</td>
<td>max.: INT_MAX</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin slip</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

**attributes:**
- global
- block search
- link
- Not classified
- No restrictions

### INT $TC_MPPC5[32000,32000]$

**description:**
The type can be specified by machine data. INT is the default setting.

**$TC_MPPCS[n,m]$**

**description of field limits:**
- **n:** Physical magazine number
- **m:** Physical location number

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>NCK version:</th>
<th>06.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit</td>
<td>min.: INT_MIN</td>
<td>max.: INT_MAX</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin slip</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

**attributes:**
- global
- block search
- link
- Not classified
- No restrictions
### $TC\_MPPC6\[32000,32000\]$

<table>
<thead>
<tr>
<th>Description:</th>
<th>The type can be specified by machine data. INT is the default setting.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field Limits:</td>
<td>$TC_MPPC6[n,m]$</td>
</tr>
<tr>
<td>$n$:</td>
<td>Physical magazine number</td>
</tr>
<tr>
<td>$m$:</td>
<td>Physical location number</td>
</tr>
<tr>
<td>Axis Identifier:</td>
<td>NCK version: 06.00.00</td>
</tr>
<tr>
<td>Unit:</td>
<td>INT_MIN</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
</tr>
<tr>
<td>Attributes:</td>
<td>global</td>
</tr>
<tr>
<td></td>
<td>Not classified</td>
</tr>
</tbody>
</table>

### $TC\_MPPC7\[32000,32000\]$

<table>
<thead>
<tr>
<th>Description:</th>
<th>The type can be specified by machine data. INT is the default setting.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field Limits:</td>
<td>$TC_MPPC7[n,m]$</td>
</tr>
<tr>
<td>$n$:</td>
<td>Physical magazine number</td>
</tr>
<tr>
<td>$m$:</td>
<td>Physical location number</td>
</tr>
<tr>
<td>Axis Identifier:</td>
<td>NCK version: 06.00.00</td>
</tr>
<tr>
<td>Unit:</td>
<td>INT_MIN</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
</tr>
<tr>
<td>Attributes:</td>
<td>global</td>
</tr>
<tr>
<td></td>
<td>Not classified</td>
</tr>
</tbody>
</table>

### $TC\_MPPC8\[32000,32000\]$

<table>
<thead>
<tr>
<th>Description:</th>
<th>The type can be specified by machine data. INT is the default setting.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field Limits:</td>
<td>$TC_MPPC8[n,m]$</td>
</tr>
<tr>
<td>$n$:</td>
<td>Physical magazine number</td>
</tr>
<tr>
<td>$m$:</td>
<td>Physical location number</td>
</tr>
<tr>
<td>Axis Identifier:</td>
<td>NCK version: 06.00.00</td>
</tr>
<tr>
<td>Unit:</td>
<td>INT_MIN</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
</tr>
<tr>
<td>Attributes:</td>
<td>global</td>
</tr>
<tr>
<td></td>
<td>Not classified</td>
</tr>
</tbody>
</table>
### System variable

**$TC_MPPC9[32000,32000]$**

**description:**
The type can be specified by machine data. INT is the default setting.

**$TC_MPPC9[n,m]$**

**description of field limits:**
- **n:** Physical magazine number
- **m:** Physical location number

**axis identifier:**
- **run-in:** min.
- **run:** INT_MIN
- **run:** max.
- **run:** INT_MAX

**unit:**
- **run:** min.
- **run:** INT_MIN
- **run:** max.
- **run:** INT_MAX

**read:**
- **X**
- **X**

**write:**
- **X**
- **7**

**attributes:**
- **global**
- **block search**
- **link**

**NCK version:** 06.00.00

**run-in main run runin slip Mrun syn PP SA OPT OEM access rights**

**read:** XX

**write:** XX 7

**attributes:** global block search link

**Not classified**

**No restrictions**

---

**$TC_MPPC10[32000,32000]$**

**description:**
The type can be specified by machine data. INT is the default setting.

**$TC_MPPC10[n,m]$**

**description of field limits:**
- **n:** Physical magazine number
- **m:** Physical location number

**axis identifier:**
- **run-in:** min.
- **run:** INT_MIN
- **run:** max.
- **run:** INT_MAX

**unit:**
- **run:** min.
- **run:** INT_MIN
- **run:** max.
- **run:** INT_MAX

**read:**
- **X**
- **X**

**write:**
- **X**
- **7**

**attributes:**
- **global**
- **block search**
- **link**

**NCK version:** 06.00.00

**run-in main run runin slip Mrun syn PP SA OPT OEM access rights**

**read:** XX

**write:** XX 7

**attributes:** global block search link

**Not classified**

**No restrictions**

---

**$TC_MPPCS1[32000,32000]$**

**description:**
The type can be specified by machine data. INT is the default setting.

**$TC_MPPCS1[n,m]$**

**description of field limits:**
- **n:** Physical magazine number
- **m:** Physical location number

**axis identifier:**
- **run-in:** min.
- **run:** INT_MIN
- **run:** max.
- **run:** INT_MAX

**unit:**
- **run:** min.
- **run:** INT_MIN
- **run:** max.
- **run:** INT_MAX

**read:**
- **X**
- **X**

**write:**
- **X**
- **7**

**attributes:**
- **global**
- **block search**
- **link**

**NCK version:** 18.00.00

**run-in main run runin slip Mrun syn PP SA OPT OEM access rights**

**read:** XX

**write:** XX 7

**attributes:** global block search link

**Not classified**

**No restrictions**
### $TC_MPPCS2[32000,32000]$

| Description: The type can be specified by machine data. INT is the default setting. |
| Description of field limits: |
| n: Physical magazine number |
| m: Physical location number |
| Axis identifier: |
| Unit: |
| Run-in | Main | Runin slip | Mrun syn | PP | SA | OPT | OEM | Access rights |
| Min: | INT_MIN | Max: | INT_MAX | |
| Read: X | | X | | | | | |
| Write: X | | X | | | | | 7 |
| Attributes: Global | Block search | Link | |
| Not classified | No restrictions | |

### $TC_MPPCS3[32000,32000]$

| Description: The type can be specified by machine data. INT is the default setting. |
| Description of field limits: |
| n: Physical magazine number |
| m: Physical location number |
| Axis identifier: |
| Unit: |
| Run-in | Main | Runin slip | Mrun syn | PP | SA | OPT | OEM | Access rights |
| Min: | INT_MIN | Max: | INT_MAX | |
| Read: X | | X | | | | | |
| Write: X | | X | | | | | 7 |
| Attributes: Global | Block search | Link | |
| Not classified | No restrictions | |

### $TC_MPPCS4[32000,32000]$

| Description: The type can be specified by machine data. INT is the default setting. |
| Description of field limits: |
| n: Physical magazine number |
| m: Physical location number |
| Axis identifier: |
| Unit: |
| Run-in | Main | Runin slip | Mrun syn | PP | SA | OPT | OEM | Access rights |
| Min: | INT_MIN | Max: | INT_MAX | |
| Read: X | | X | | | | | |
| Write: X | | X | | | | | 7 |
| Attributes: Global | Block search | Link | |
| Not classified | No restrictions | |
### $TC_MPPCS5[32000,32000]$

<table>
<thead>
<tr>
<th>Description:</th>
<th>The type can be specified by machine data. INT is the default setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>$TC_MPPCS5[n,m]$</td>
<td>description of field limits: n: Physical magazine number m: Physical location number</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Axis</th>
<th>Identifier</th>
<th>NCK version: 18.00.00</th>
<th>Run-in</th>
<th>Main Run</th>
<th>Run-in Slip</th>
<th>Mrun Syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>INT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Read</th>
<th>Write</th>
<th>Attributes</th>
<th>Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
<td>global</td>
<td></td>
</tr>
</tbody>
</table>

**Attributes:**
- block search
- link

**Not classified**
- No restrictions

---

### $TC_MPPCS6[32000,32000]$

<table>
<thead>
<tr>
<th>Description:</th>
<th>The type can be specified by machine data. INT is the default setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>$TC_MPPCS6[n,m]$</td>
<td>description of field limits: n: Physical magazine number m: Physical location number</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Axis</th>
<th>Identifier</th>
<th>NCK version: 18.00.00</th>
<th>Run-in</th>
<th>Main Run</th>
<th>Run-in Slip</th>
<th>Mrun Syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>INT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Read</th>
<th>Write</th>
<th>Attributes</th>
<th>Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
<td>global</td>
<td></td>
</tr>
</tbody>
</table>

**Attributes:**
- block search
- link

**Not classified**
- No restrictions

---

### $TC_MPPCS7[32000,32000]$

<table>
<thead>
<tr>
<th>Description:</th>
<th>The type can be specified by machine data. INT is the default setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>$TC_MPPCS7[n,m]$</td>
<td>description of field limits: n: Physical magazine number m: Physical location number</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Axis</th>
<th>Identifier</th>
<th>NCK version: 18.00.00</th>
<th>Run-in</th>
<th>Main Run</th>
<th>Run-in Slip</th>
<th>Mrun Syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>INT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Read</th>
<th>Write</th>
<th>Attributes</th>
<th>Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
<td>global</td>
<td></td>
</tr>
</tbody>
</table>

**Attributes:**
- block search
- link

**Not classified**
- No restrictions
### 1.14 Magazine location data for OEM users

**$TC_MPPCS8[32000,32000]$**

**description:**
The type can be specified by machine data. INT is the default setting.

**$TC_MPPCS8[n,m]$**

**description of field limits:**
- **n:** Physical magazine number
- **m:** Physical location number

<table>
<thead>
<tr>
<th>Identifier</th>
<th>NCK version</th>
<th>unit</th>
<th>min.</th>
<th>max.</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>INT_MIN</td>
<td>runn slip</td>
<td>Mrun syn</td>
<td>PP</td>
<td>SA</td>
</tr>
<tr>
<td>read: X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>write: X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>attributes: global</td>
<td>block search</td>
<td>link</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**$TC_MPPCS9[32000,32000]$**

**description:**
The type can be specified by machine data. INT is the default setting.

**$TC_MPPCS9[n,m]$**

**description of field limits:**
- **n:** Physical magazine number
- **m:** Physical location number

<table>
<thead>
<tr>
<th>Identifier</th>
<th>NCK version</th>
<th>unit</th>
<th>min.</th>
<th>max.</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>INT_MIN</td>
<td>runn slip</td>
<td>Mrun syn</td>
<td>PP</td>
<td>SA</td>
</tr>
<tr>
<td>read: X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>write: X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>attributes: global</td>
<td>block search</td>
<td>link</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**$TC_MPPCS10[32000,32000]$**

**description:**
The type can be specified by machine data. INT is the default setting.

**$TC_MPPCS10[n,m]$**

**description of field limits:**
- **n:** Physical magazine number
- **m:** Physical location number

<table>
<thead>
<tr>
<th>Identifier</th>
<th>NCK version</th>
<th>unit</th>
<th>min.</th>
<th>max.</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>INT_MIN</td>
<td>runn slip</td>
<td>Mrun syn</td>
<td>PP</td>
<td>SA</td>
</tr>
<tr>
<td>read: X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>write: X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>attributes: global</td>
<td>block search</td>
<td>link</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### System Variable Description

**$TC_MDP1[n,m]$**

**Description:**
Distance to tool change point between magazine n and location m of 1st internal magazine.

**Internal Mag. 1 Distance Parameter**

<table>
<thead>
<tr>
<th>Axis Identifier:</th>
<th>NCK Version: 06.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit:</td>
<td>INT_MIN</td>
</tr>
<tr>
<td>Run-in</td>
<td>INT_MIN</td>
</tr>
<tr>
<td>Main Run</td>
<td>INT_MAX</td>
</tr>
<tr>
<td>Run-in Stop</td>
<td>INT_MAX</td>
</tr>
<tr>
<td>M-run Stop</td>
<td>INT_MAX</td>
</tr>
</tbody>
</table>

**Read:**
- Run-in: X
- Main Run: X
- Run-in Stop: X
- M-run Stop: X

**Write:**
- Run-in: X
- Main Run: X
- Run-in Stop: X
- M-run Stop: X

**Attributes:**
- Global
- Block Search
- Link

**Access Rights:**
- Not classified
- No restrictions

---

**$TC_MDP2[n,m]$**

**Description:**
Distance to tool change point between magazine n and location m of 2nd internal magazine.

**Internal Mag. 2 Distance Parameter**

<table>
<thead>
<tr>
<th>Axis Identifier:</th>
<th>NCK Version: 06.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit:</td>
<td>INT_MIN</td>
</tr>
<tr>
<td>Run-in</td>
<td>INT_MIN</td>
</tr>
<tr>
<td>Main Run</td>
<td>INT_MAX</td>
</tr>
<tr>
<td>Run-in Stop</td>
<td>INT_MAX</td>
</tr>
<tr>
<td>M-run Stop</td>
<td>INT_MAX</td>
</tr>
</tbody>
</table>

**Read:**
- Run-in: X
- Main Run: X
- Run-in Stop: X
- M-run Stop: X

**Write:**
- Run-in: X
- Main Run: X
- Run-in Stop: X
- M-run Stop: X

**Attributes:**
- Global
- Block Search
- Link

**Access Rights:**
- Not classified
- No restrictions
### 1.14 Magazine location data for OEM users

#### $TC_MLSR[32000,32000]$

<table>
<thead>
<tr>
<th>Description</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignment of buffer location n to buffer location m</td>
<td></td>
</tr>
<tr>
<td>n must identify a location which is not a 'Spindle' type location.</td>
<td></td>
</tr>
<tr>
<td>In this way it is possible, for example, to define which grippers, spindles, etc. are assigned. The default parameter setting is 0.</td>
<td></td>
</tr>
<tr>
<td>The write operation defines a relationship, the read operation checks whether a particular relationship exists. If it does not exist, the read operation generates an alarm.</td>
<td></td>
</tr>
<tr>
<td>define links of grippers,... to spindles.</td>
<td></td>
</tr>
</tbody>
</table>

#### Field limits:

- **n**: Physical magazine location number of location type other than SPINDLE
- **m**: Physical magazine location number of location type SPINDLE

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>NCK version:</th>
<th>06.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit:</td>
<td>-</td>
<td>INT_MIN</td>
</tr>
<tr>
<td>Run-in:</td>
<td></td>
<td>INT_MAX</td>
</tr>
<tr>
<td>main run:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>runin stp:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mrun syn:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OPT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OEM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access Rights:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Attributes:</td>
<td>global</td>
<td>block</td>
</tr>
<tr>
<td></td>
<td>search</td>
<td>link</td>
</tr>
<tr>
<td></td>
<td>Not classified</td>
<td>No restrictions</td>
</tr>
</tbody>
</table>

---

#### $TC_MPTH[MD_SLMAXHIERARCHYNUMBER,MD_SLMAXHIERARCHYENTRIES]$

<table>
<thead>
<tr>
<th>Description</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Magazine location type hierarchy mag.location (place)types hierarchy parameter</td>
<td></td>
</tr>
</tbody>
</table>

#### Field limits:

- **n**: Hierarchy 0 - SLMAXHIERARCHYNUMBER-1
- **m**: Location type 0 - SLMAXHIERARCHYENTRIES - 1

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>NCK version:</th>
<th>06.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit:</td>
<td>-</td>
<td>INT_MIN</td>
</tr>
<tr>
<td>Run-in:</td>
<td></td>
<td>INT_MAX</td>
</tr>
<tr>
<td>main run:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>runin stp:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mrun syn:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OPT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OEM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access Rights:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Attributes:</td>
<td>global</td>
<td>block</td>
</tr>
<tr>
<td></td>
<td>search</td>
<td>link</td>
</tr>
<tr>
<td></td>
<td>Not classified</td>
<td>No restrictions</td>
</tr>
</tbody>
</table>
1.15 Magazine description data for tool management

<table>
<thead>
<tr>
<th>STRING</th>
<th>$TC_MAP2[32000]</th>
<th>description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identifier of magazine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>description of field limits:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>n: Magazine number 1 - ..</td>
<td></td>
<td></td>
</tr>
<tr>
<td>axis identifier:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NCK version:</td>
<td>06.00.00</td>
<td></td>
</tr>
<tr>
<td>unit:</td>
<td>-</td>
<td>min.:</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin stp</td>
</tr>
<tr>
<td>read:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>attributes: global block search link</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not classified No restrictions</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>INT</th>
<th>$TC_MAP1[32000]</th>
<th>description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of magazine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>description of field limits:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>n: Magazine number 1 - ..</td>
<td></td>
<td></td>
</tr>
<tr>
<td>axis identifier:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NCK version:</td>
<td>06.00.00</td>
<td></td>
</tr>
<tr>
<td>unit:</td>
<td>-</td>
<td>min.:</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin stp</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>attributes: global block search link</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not classified No restrictions</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>INT</th>
<th>$TC_MAP3[32000]</th>
<th>description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Status of magazine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>description of field limits:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>n: Magazine number 1 - ..</td>
<td></td>
<td></td>
</tr>
<tr>
<td>axis identifier:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NCK version:</td>
<td>06.00.00</td>
<td></td>
</tr>
<tr>
<td>unit:</td>
<td>-</td>
<td>min.:</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin stp</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>attributes: global block search link</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not classified No restrictions</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### $TC\_MAP4[32000]$

<table>
<thead>
<tr>
<th>Description:</th>
<th>$TC_MAP4[n]$</th>
<th>Chaining to next magazine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description of field limits:</td>
<td>n: Magazine number 1 - ..</td>
<td></td>
</tr>
<tr>
<td>Axis identifier:</td>
<td>-</td>
<td><strong>NCK version:</strong> 06.00.00</td>
</tr>
<tr>
<td>Unit:</td>
<td><strong>min.</strong>: INT_MIN</td>
<td><strong>max.</strong>: INT_MAX</td>
</tr>
<tr>
<td>Run-in:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Main run:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Run-in stp:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Mrun syn:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PP</td>
<td>SA</td>
<td>OPT</td>
</tr>
<tr>
<td>Read:</td>
<td>XX</td>
<td></td>
</tr>
<tr>
<td>Write:</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Attributes:</td>
<td>global</td>
<td>block search</td>
</tr>
<tr>
<td>Classified:</td>
<td>No classification</td>
<td>No restrictions</td>
</tr>
</tbody>
</table>

### $TC\_MAP5[32000]$

<table>
<thead>
<tr>
<th>Description:</th>
<th>$TC_MAP5[n]$</th>
<th>Chaining to previous magazine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description of field limits:</td>
<td>n: Magazine number 1 - ..</td>
<td></td>
</tr>
<tr>
<td>Axis identifier:</td>
<td>-</td>
<td><strong>NCK version:</strong> 06.00.00</td>
</tr>
<tr>
<td>Unit:</td>
<td><strong>min.</strong>: INT_MIN</td>
<td><strong>max.</strong>: INT_MAX</td>
</tr>
<tr>
<td>Run-in:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Main run:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Run-in stp:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Mrun syn:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PP</td>
<td>SA</td>
<td>OPT</td>
</tr>
<tr>
<td>Read:</td>
<td>XX</td>
<td></td>
</tr>
<tr>
<td>Write:</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Attributes:</td>
<td>global</td>
<td>block search</td>
</tr>
<tr>
<td>Classified:</td>
<td>No classification</td>
<td>No restrictions</td>
</tr>
</tbody>
</table>

### $TC\_MAP6[32000]$

<table>
<thead>
<tr>
<th>Description:</th>
<th>$TC_MAP6[n]$</th>
<th>Number of lines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description of field limits:</td>
<td>n: Magazine number 1 - ..</td>
<td></td>
</tr>
<tr>
<td>Axis identifier:</td>
<td>-</td>
<td><strong>NCK version:</strong> 06.00.00</td>
</tr>
<tr>
<td>Unit:</td>
<td><strong>min.</strong>: INT_MIN</td>
<td><strong>max.</strong>: INT_MAX</td>
</tr>
<tr>
<td>Run-in:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Main run:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Run-in stp:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Mrun syn:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PP</td>
<td>SA</td>
<td>OPT</td>
</tr>
<tr>
<td>Read:</td>
<td>XX</td>
<td></td>
</tr>
<tr>
<td>Write:</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Attributes:</td>
<td>global</td>
<td>block search</td>
</tr>
<tr>
<td>Classified:</td>
<td>No classification</td>
<td>No restrictions</td>
</tr>
</tbody>
</table>
### System variable $TC_MAP7[32000]$ description:

$TC_MAP7[n]$

Number of columns
description of field limits:

<table>
<thead>
<tr>
<th>n: Magazine number 1 - ..</th>
</tr>
</thead>
<tbody>
<tr>
<td>axis identifier:</td>
</tr>
<tr>
<td>run-in</td>
</tr>
<tr>
<td>read:</td>
</tr>
<tr>
<td>write:</td>
</tr>
<tr>
<td>attributes:</td>
</tr>
<tr>
<td>Not classified</td>
</tr>
</tbody>
</table>

### System variable $TC_MAP8[32000]$ description:

$TC_MAP8[n]$

Current magazine position in relation to tool change position
description of field limits:

<table>
<thead>
<tr>
<th>n: Magazine number 1 - ..</th>
</tr>
</thead>
<tbody>
<tr>
<td>axis identifier:</td>
</tr>
<tr>
<td>run-in</td>
</tr>
<tr>
<td>read:</td>
</tr>
<tr>
<td>write:</td>
</tr>
<tr>
<td>attributes:</td>
</tr>
<tr>
<td>Not classified</td>
</tr>
</tbody>
</table>

### System variable $TC_MAP9[32000]$ description:

$TC_MAP9[n]$

Current wear group number
description of field limits:

<table>
<thead>
<tr>
<th>n: Magazine number 1 - ..</th>
</tr>
</thead>
<tbody>
<tr>
<td>axis identifier:</td>
</tr>
<tr>
<td>run-in</td>
</tr>
<tr>
<td>read:</td>
</tr>
<tr>
<td>write:</td>
</tr>
<tr>
<td>attributes:</td>
</tr>
<tr>
<td>Not classified</td>
</tr>
</tbody>
</table>
### 1.16 Magazine description data for OEM user tool management

#### $TC_MAP10[32000]$

<table>
<thead>
<tr>
<th>RUN-IN</th>
<th>MAIN RUN</th>
<th>RUNIN STP</th>
<th>MRUN SYN</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>ACCESS RIGHTS</th>
<th>READ</th>
<th>WRITE</th>
<th>ATTRIBUTES</th>
<th>UNIT</th>
<th>MIN.</th>
<th>MAX.</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**description:**

$TC_MAP10[n]$

Current search strategies of magazine.
- Tool search strategy
- Empty location search strategy

The NCK enters the value of $TC_MAMP2$ per default.

**description of field limits:**

- n: Magazine number 1 - ..
- axis identifier: NCK version: 20.00.00
- unit: INT_MIN INT_MAX
- run-in | main run | runin stp | Mrun syn | PP | SA | OPT | OEM | access rights
- read: | write: |
- attributes: global | block search | link
- Not classified | No restrictions

---

#### $TC_MAPC1[32000]$

<table>
<thead>
<tr>
<th>RUN-IN</th>
<th>MAIN RUN</th>
<th>RUNIN STP</th>
<th>MRUN SYN</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>ACCESS RIGHTS</th>
<th>READ</th>
<th>WRITE</th>
<th>ATTRIBUTES</th>
<th>UNIT</th>
<th>MIN.</th>
<th>MAX.</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**description:**

The type can be specified by machine data. INT is the default setting.

$TC_MAPC1[n]$

**description of field limits:**

- n: Magazine number 1 - ..
- axis identifier: NCK version: 06.00.00
- unit: INT_MIN INT_MAX
- run-in | main run | runin stp | Mrun syn | PP | SA | OPT | OEM | access rights
- read: | write: |
- attributes: global | block search | link
- Not classified | No restrictions
### $TC\_MAPC2[32000]$ Description:
The type can be specified by machine data. INT is the default setting.

#### Description of Field Limits:
- **Axis Identifier:**
  - NCK version: 06.00.00

#### Unit:
- **Run-in:**
  - **Min.:** INT_MIN
  - **Max.:** INT_MAX

<table>
<thead>
<tr>
<th>Access</th>
<th>Run</th>
<th>Main</th>
<th>Runin</th>
<th>Mrun</th>
<th>Syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Read:</strong></td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Write:</strong></td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Attributes:**
- Global
- Block search
- Link

- **Not classified**
- **No restrictions**

### $TC\_MAPC3[32000]$ Description:
The type can be specified by machine data. INT is the default setting.

#### Description of Field Limits:
- **Axis Identifier:**
  - NCK version: 06.00.00

#### Unit:
- **Run-in:**
  - **Min.:** INT_MIN
  - **Max.:** INT_MAX

<table>
<thead>
<tr>
<th>Access</th>
<th>Run</th>
<th>Main</th>
<th>Runin</th>
<th>Mrun</th>
<th>Syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Read:</strong></td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Write:</strong></td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Attributes:**
- Global
- Block search
- Link

- **Not classified**
- **No restrictions**

### $TC\_MAPC4[32000]$ Description:
The type can be specified by machine data. INT is the default setting.

#### Description of Field Limits:
- **Axis Identifier:**
  - NCK version: 06.00.00

#### Unit:
- **Run-in:**
  - **Min.:** INT_MIN
  - **Max.:** INT_MAX

<table>
<thead>
<tr>
<th>Access</th>
<th>Run</th>
<th>Main</th>
<th>Runin</th>
<th>Mrun</th>
<th>Syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Read:</strong></td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Write:</strong></td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Attributes:**
- Global
- Block search
- Link

- **Not classified**
- **No restrictions**
### $TC\_MAPC5[32000]$

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>The type</strong></td>
<td>can be specified by machine data. <strong>INT</strong> is the default setting</td>
</tr>
<tr>
<td><strong>$TC_MAPC5[n]$</strong></td>
<td></td>
</tr>
<tr>
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<tr>
<td><strong>Run-in</strong></td>
<td><strong>Main run</strong></td>
</tr>
<tr>
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<tr>
<td><strong>Write:</strong></td>
<td>X</td>
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<tr>
<td><strong>Unit:</strong></td>
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<tr>
<td><strong>Run-in</strong></td>
<td><strong>Main run</strong></td>
</tr>
<tr>
<td><strong>Read:</strong></td>
<td>X</td>
</tr>
<tr>
<td><strong>Write:</strong></td>
<td>X</td>
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<tr>
<td><strong>Run-in</strong></td>
<td><strong>Main run</strong></td>
</tr>
<tr>
<td><strong>Read:</strong></td>
<td>X</td>
</tr>
<tr>
<td><strong>Write:</strong></td>
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<tr>
<td>unit:</td>
<td>- min.: INT_MIN max.: INT_MAX</td>
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<tr>
<td>run-in</td>
<td>main run</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
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#### Not classified
No restrictions

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</tr>
<tr>
<td>run-in</td>
<td>main run</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
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#### Not classified
No restrictions

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<td>run-in</td>
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<tr>
<td>read:</td>
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#### Not classified
No restrictions
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<td>Run-in</td>
<td>Runin</td>
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<tr>
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<td>Write:</td>
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</tr>
<tr>
<td>INT_MIN</td>
<td>INT_MAX</td>
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<tr>
<td>Run-in</td>
<td>Runin</td>
</tr>
<tr>
<td>Read:</td>
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<td>Write:</td>
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<td>Runin</td>
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<td>Read:</td>
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<td>INT_MAX</td>
<td></td>
</tr>
<tr>
<td>read: X</td>
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<td>access: 7</td>
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**Description:**
The type can be specified by machine data. INT is the default setting.

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**Description:**
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<td>INT_MAX</td>
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**Description:**
The type can be specified by machine data. INT is the default setting.
### 1.16 Magazine description data for OEM user tool management

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<td>n: Magazine number 1 - ..</td>
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<td>Mrun syn</td>
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### 1.18 Adapter data

| INT  | $TC_MAMP3[-1]          | description: |
|------|------------------------|
|      | $TC_MAMP3              |
|      | Handling of tools in wear groups |
|      | description of field limits: |
|      | Scalar variable |
| axis identifier: | NCK version: 15.00.00 |
| unit: | - | min.: INT_MIN | max.: INT_MAX |
| run-in | main run | runin stp | Mrun syn | PP | SA | OPT | OEM | access rights |
| read: | X | | | | | | | |
| write: | X | | | | | | | |
| attributes: | global | block search | link |
| Not classified | No restrictions |

### 1.18 Adapter data

| INT  | $TC_ADPTT[32000]          | description: |
|------|---------------------------|
|      | $TC_ADPTT[a]              |
|      | Adapter transformation number |
|      | description of field limits: |
|      | a: Adapter number 1 - 32000 |
| axis identifier: | NCK version: 15.00.00 |
| unit: | - | min.: INT_MIN | max.: INT_MAX |
| run-in | main run | runin stp | Mrun syn | PP | SA | OPT | OEM | access rights |
| read: | X | | | | | | | |
| write: | X | | | | | | | |
| attributes: | global | block search | link |
| Not classified | No restrictions |

### 1.18 Adapter data

| DOUBLE | $TC_ADPT1[32000]          | description: |
|--------|---------------------------|
|        | $TC_ADPT1[a]              |
|        | Adapter geometry: Length 1 |
|        | description of field limits: |
|        | a: Adapter number 1 - 32000 |
| axis identifier: | NCK version: 15.00.00 |
| unit: | mm | min.: DBL_MIN | max.: DBL_MAX |
| run-in | main run | runin stp | Mrun syn | PP | SA | OPT | OEM | access rights |
| read: | X | | | | | | | |
| write: | X | | | | | | | |
| attributes: | global | block search | link |
| Not classified | No restrictions |
### $TC_ADPT2[32000]

<table>
<thead>
<tr>
<th>Description:</th>
<th>$TC_ADPT2[a]</th>
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</thead>
<tbody>
<tr>
<td>Adapter geometry:</td>
<td>Length 2</td>
</tr>
</tbody>
</table>

#### Description of Field Limits:
- **a**: Adapter number 1 - 32000

<table>
<thead>
<tr>
<th>Axis Identifier:</th>
<th>NCK version: 15.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit:</td>
<td>mm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Read:</th>
<th>Write:</th>
<th>Run-in</th>
<th>Main Run</th>
<th>Runin Slp</th>
<th>Mrun Syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
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<td></td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
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<th>block search</th>
<th>link</th>
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<tbody>
<tr>
<td>Global</td>
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</table>

### $TC_ADPT3[32000]

<table>
<thead>
<tr>
<th>Description:</th>
<th>$TC_ADPT3[a]</th>
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</thead>
<tbody>
<tr>
<td>Adapter geometry:</td>
<td>Length 3</td>
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</table>

#### Description of Field Limits:
- **a**: Adapter number 1 - 32000

<table>
<thead>
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<th>Axis Identifier:</th>
<th>NCK version: 15.00.00</th>
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</thead>
<tbody>
<tr>
<td>Unit:</td>
<td>mm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Read:</th>
<th>Write:</th>
<th>Run-in</th>
<th>Main Run</th>
<th>Runin Slp</th>
<th>Mrun Syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>Access Rights</th>
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<tbody>
<tr>
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</thead>
<tbody>
<tr>
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</tbody>
</table>
## 1.19 Measuring system compensation values

### $AA\_ENC\_COMP[n,m]$

<table>
<thead>
<tr>
<th>Description:</th>
<th>Compensation values</th>
</tr>
</thead>
<tbody>
<tr>
<td>$AA_ENC_COMP[n,m,a]$</td>
<td>Machine axes</td>
</tr>
<tr>
<td><strong>Axis</strong> identifier:</td>
<td>MACHAX</td>
</tr>
<tr>
<td><strong>NCK version:</strong></td>
<td>06.00.00</td>
</tr>
<tr>
<td><strong>Unit:</strong></td>
<td>Linear / angular position</td>
</tr>
<tr>
<td><strong>Min.:</strong></td>
<td>DBL_MIN</td>
</tr>
<tr>
<td><strong>Max.:</strong></td>
<td>DBL_MAX</td>
</tr>
<tr>
<td><strong>Run-in</strong></td>
<td>main run runin slp Mrun syn</td>
</tr>
<tr>
<td><strong>Access rights</strong></td>
<td>read: X write: X</td>
</tr>
<tr>
<td><strong>Attributes:</strong></td>
<td>Not classified</td>
</tr>
</tbody>
</table>

### $AA\_ENC\_COMP\_STEP[n,31]$

<table>
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<tr>
<th>Description:</th>
<th>Increment</th>
</tr>
</thead>
<tbody>
<tr>
<td>$AA_ENC_COMP_STEP[n,a]$</td>
<td>Machine axes</td>
</tr>
<tr>
<td><strong>Axis</strong> identifier:</td>
<td>MACHAX</td>
</tr>
<tr>
<td><strong>NCK version:</strong></td>
<td>06.00.00</td>
</tr>
<tr>
<td><strong>Unit:</strong></td>
<td>Linear / angular position</td>
</tr>
<tr>
<td><strong>Min.:</strong></td>
<td>DBL_MIN</td>
</tr>
<tr>
<td><strong>Max.:</strong></td>
<td>DBL_MAX</td>
</tr>
<tr>
<td><strong>Run-in</strong></td>
<td>main run runin slp Mrun syn</td>
</tr>
<tr>
<td><strong>Access rights</strong></td>
<td>read: X write: X</td>
</tr>
<tr>
<td><strong>Attributes:</strong></td>
<td>Not classified</td>
</tr>
</tbody>
</table>
### Measuring system compensation values

**$\text{AA\_ENC\_COMP\_MIN}[n,31]$**

**Description:**
$\text{AA\_ENC\_COMP\_MIN}[n,a]$
Start position of compensation

**Axes identifier:** MACHAX

**Unit:** Linear / angular position

<table>
<thead>
<tr>
<th>Run-in</th>
<th>Main Run</th>
<th>Run in Stop</th>
<th>Mrun Stop</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

**Attributes:**
- Global
- Block
- Search
- Link

**Access:**
- Not classified
- No restrictions

**$\text{AA\_ENC\_COMP\_MAX}[n,31]$**

**Description:**
$\text{AA\_ENC\_COMP\_MAX}[n,a]$
End position of compensation

**Axes identifier:** MACHAX

**Unit:** Linear / angular position

<table>
<thead>
<tr>
<th>Run-in</th>
<th>Main Run</th>
<th>Run in Stop</th>
<th>Mrun Stop</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
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</tbody>
</table>

**Attributes:**
- Global
- Block
- Search
- Link

**Access:**
- Not classified
- No restrictions
### 1.20 Quadrant error compensation

#### BOOL

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\text{AA_ENC_COMP_IS_MODULO}[n,3,1]$</td>
</tr>
<tr>
<td>Compensation is modulo</td>
</tr>
<tr>
<td>a: Machine axes</td>
</tr>
<tr>
<td>n: Encoder no. 0-1 to be defined</td>
</tr>
</tbody>
</table>

#### Description of field limits:

- **Axis identifier:** MACHAX
- **Unit:** -
- **MIN:** FALSE
- **MAX:** TRUE

**Run-in:** main run runin stp Mrun syn PP SA OPI OEM Access rights

**Read:** X X

**Write:** X 7

**Attributes:** global block search link

- Not classified
- No restrictions

### DOUBLE

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\text{AA_QEC}[n,m]$</td>
</tr>
<tr>
<td>Result of learning process</td>
</tr>
<tr>
<td>a: Machine axes</td>
</tr>
<tr>
<td>n: 0</td>
</tr>
<tr>
<td>m: No. of point: 0 - $\text{MA_MM_QEC_MAX_POINTS}$</td>
</tr>
</tbody>
</table>

#### Description of field limits:

- **Axis identifier:** MACHAX
- **Unit:** -
- **MIN:** DBL_MIN
- **MAX:** DBL_MAX

**Run-in:** main run runin stp Mrun syn PP SA OPI OEM Access rights

**Read:** X X

**Write:** X 7

**Attributes:** global block search link

- Not classified
- No restrictions
### $AA_QEC_COARSE_STEPS[n,31]$

| Description: Compensation values: Rough quantization of characteristic 
| Description of field limits: 
| n: 0 to be defined 
| Axis identifier: MACHAX 
| NCK version: 06.00.00 
| Unit: INT

<table>
<thead>
<tr>
<th>run-in</th>
<th>main</th>
<th>run residual</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>attributes: global</td>
<td>block search</td>
<td>link</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Not classified No restrictions

### $AA_QEC_FINE_STEPS[n,31]$

| Description: Fine quantization of characteristic 
| Description of field limits: 
| n: 0 to be defined 
| Axis identifier: MACHAX 
| NCK version: 06.00.00 
| Unit: INT

<table>
<thead>
<tr>
<th>run-in</th>
<th>main</th>
<th>run residual</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>attributes: global</td>
<td>block search</td>
<td>link</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Not classified No restrictions
### $AA_QEC_ACCEL_1[n,31]$

**Description:**
Acceleration at 1st knee point according to definition [mm/s² or inch/s² or degree/s²]

**Axis Identifier:** MACHAX

**NCK Version:** 06.00.00

**Unit:** Linear / Angular position

<table>
<thead>
<tr>
<th>Run-in</th>
<th>Main Run</th>
<th>Runin Stp</th>
<th>Mrun Syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Read:** X  
**Write:** X

**Attributes:** Global, Block Search, Link

**Not Classified: No Restrictions**

### $AA_QEC_ACCEL_2[n,31]$

**Description:**
Acceleration at 2nd knee point according to definition [mm/s² or inch/s² or degree/s²]

**Axis Identifier:** MACHAX

**NCK Version:** 06.00.00

**Unit:** Linear / Angular position

<table>
<thead>
<tr>
<th>Run-in</th>
<th>Main Run</th>
<th>Runin Stp</th>
<th>Mrun Syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Read:** X  
**Write:** X

**Attributes:** Global, Block Search, Link

**Not Classified: No Restrictions**
### $AA_QEC_ACCEL_3[n,a]$  
**description:**
Acceleration at 3rd knee point according to definition [mm/s² or inch/s² or degree/s²]

- **a:** Machine axes

### Field limits:
- **n:** 0 to be defined

#### Axis identifier:
- **MACHAX**

#### Unit:
- Linear / angular position
- min.: DBL_MIN
- max.: DBL_MAX

#### Access rights:
- read: XX
- write: XX 7

#### Attributes:
- global
- block
- search
- link

### $AA_QEC_MEAS_TIME_1[n,a]$  
**description:**
Measuring time for range $AA_QEC_ACCEL_1$

- **a:** Machine axes

### Field limits:
- **n:** 0 to be defined

#### Axis identifier:
- **MACHAX**

#### Unit:
- s
- min.: DBL_MIN
- max.: DBL_MAX

#### Access rights:
- read: XX
- write: XX 7

#### Attributes:
- global
- block
- search
- link

Not classified No restrictions
### 1.20 Quadrant error compensation

**DOUBLE $AA_QEC_MEAS_TIME_2[n,31]$**

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<thead>
<tr>
<th>n:</th>
<th></th>
</tr>
</thead>
</table>

**description:**

$AA_QEC_MEAS_TIME_2[n,a]$  
Measuring time for range $AA_QEC_ACCEL_2$  
a: Machine axes

**description of field limits:**

- **n:** 0  
  to be defined

**axis identifier:** MACHAX  
NCK version: 06.00.00

**unit:** s  
**min.:** | |  
**max.:** DBL_MAX

<table>
<thead>
<tr>
<th>run-in</th>
<th>main run</th>
<th>runin stop</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
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<th>access rights</th>
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</tr>
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**read:** X  
**write:** X  
**attributes:** global  
block search  
link

Not classified  
No restrictions

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**DOUBLE $AA_QEC_MEAS_TIME_3[n,31]$**

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**description:**

$AA_QEC_MEAS_TIME_3[n,a]$  
Measuring time for range $AA_QEC_ACCEL_3$  
a: Machine axes

**description of field limits:**

- **n:** 0  
  to be defined

**axis identifier:** MACHAX  
NCK version: 06.00.00

**unit:** s  
**min.:** | |  
**max.:** DBL_MAX

<table>
<thead>
<tr>
<th>run-in</th>
<th>main run</th>
<th>runin stop</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
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<tbody>
<tr>
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<td>X</td>
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</tbody>
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**read:** X  
**write:** X  
**attributes:** global  
block search  
link

Not classified  
No restrictions
### System variable 01/2008

#### 1.20 Quadrant error compensation

<table>
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<th>n:</th>
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</thead>
<tbody>
<tr>
<td>$AA_{QEC_TIME_1}[n,a]$</td>
<td>1. Filtering time for feedforward element</td>
<td></td>
</tr>
<tr>
<td>a: Machine axes</td>
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<td></td>
</tr>
<tr>
<td>description of field limits:</td>
<td>n: 0</td>
<td></td>
</tr>
<tr>
<td>to be defined</td>
<td></td>
<td></td>
</tr>
<tr>
<td>axis identifier: MACHAX</td>
<td></td>
<td></td>
</tr>
<tr>
<td>unit:</td>
<td>s</td>
<td>min.:</td>
</tr>
<tr>
<td>run-in</td>
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<td>main run</td>
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</tr>
<tr>
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<td></td>
<td></td>
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<tr>
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<td>No restrictions</td>
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<table>
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<th>DOUBLE $AA_{QEC_TIME_2}[n,31]$</th>
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<th>n:</th>
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<tr>
<td>$AA_{QEC_TIME_2}[n,a]$</td>
<td>2. Filtering time for feedforward element</td>
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<td>a: Machine axes</td>
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<td></td>
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<tr>
<td>description of field limits:</td>
<td>n: 0</td>
<td></td>
</tr>
<tr>
<td>to be defined</td>
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<td></td>
</tr>
<tr>
<td>axis identifier: MACHAX</td>
<td></td>
<td></td>
</tr>
<tr>
<td>unit:</td>
<td>s</td>
<td>min.:</td>
</tr>
<tr>
<td>run-in</td>
<td></td>
<td>main run</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>attributes:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not classified</td>
<td>No restrictions</td>
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</table>
### 1.20 Quadrant error compensation

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<th>description:</th>
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</thead>
<tbody>
<tr>
<td>$AA_QEC_LEARNING_RATE[n,a]$</td>
<td>Learning rate for network</td>
<td></td>
</tr>
<tr>
<td>a: Machine axes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>description of field limits:</td>
<td>n: 0</td>
<td>to be defined</td>
</tr>
<tr>
<td>axis identifier: MACHAX</td>
<td>NCK version:</td>
<td>06.00.00</td>
</tr>
<tr>
<td>unit:</td>
<td>min.:</td>
<td>max.:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>read: X</td>
<td>write: X</td>
<td></td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
</tr>
<tr>
<td></td>
<td>Not classified</td>
<td>No restrictions</td>
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<table>
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<tr>
<th>BOOL</th>
<th>$AA_QEC_DIRECTIONAL[n,31]$</th>
<th>description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$AA_QEC_DIRECTIONAL[n,a]$</td>
<td>TRUE: Direction-dependent compensation</td>
<td>FALSE: No direction-dependent compensation</td>
</tr>
<tr>
<td>a: Machine axes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>description of field limits:</td>
<td>n: 0</td>
<td>to be defined</td>
</tr>
<tr>
<td>axis identifier: MACHAX</td>
<td>NCK version:</td>
<td>06.00.00</td>
</tr>
<tr>
<td>unit:</td>
<td>min.:</td>
<td>max.:</td>
</tr>
<tr>
<td></td>
<td>FALSE</td>
<td>TRUE</td>
</tr>
<tr>
<td>read: X</td>
<td>write: X</td>
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</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
</tr>
<tr>
<td></td>
<td>Not classified</td>
<td>No restrictions</td>
</tr>
</tbody>
</table>
# 1.21 Interpolatory compensation

## DOUBLE $\$AN_CEC[n,m]

**description:**

$\$AN_CEC[n,m]$

Compensation value

**description of field limits:**

n: Number of compensation table 0 - (maximum value can be set in MD)

m: Number of interpolation point 0 - (maximum value can be set in MD)

**axis identifier:**

NCK version: 06.00.00

**unit:**

run-in main run runin stp Mrun syn PP SA OPI OEM access rights

read: X

write: X

**attributes:**

global block search link

Not classified No restrictions

## INT $\$AN_CEC_INPUT_NCU[n]

**description:**

$\$AN_CEC_INPUT_NCU[n]$

NCU on which the basic axis is calculated

**description of field limits:**

n: Number of compensation table 0 - (maximum value can be set in MD)

**axis identifier:**

NCK version: 70.00.00

**unit:**

run-in main run runin stp Mrun syn PP SA OPI OEM access rights

read: X

write: X

**attributes:**

global block search link

Not classified No restrictions

## AXIS $\$AN_CEC_INPUT_AXIS[n]

**description:**

$\$AN_CEC_INPUT_AXIS[n]$

Name of axis whose setpoint is used as the compensation table input

**description of field limits:**

n: Number of compensation table 0 - (maximum value can be set in MD)

**axis identifier:**

NCK version: 06.00.00

**unit:**

run-in main run runin stp Mrun syn PP SA OPI OEM access rights

read: X

write: X

**attributes:**

global block search link

Not classified No restrictions
### $AN_CEC_OUTPUT_NCU[n]$

**Description:**
$AN_CEC_OUTPUT_NCU[n]$: NCU on which the compensation axis is calculated

**Field Limits:**
- **n**: Number of compensation table 0 - (maximum value can be set in MD)

**Identifier:**
- NCK version: 70.00.00

**Unit:**
- run-in
- main run
- runin stop
- Mrun syn
- PP
- SA
- OPI
- OEM

**Access Rights:**
- read: X
- write: X

**Attributes:**
- global
- block search
- link
- Not classified
- No restrictions

### $AN_CEC_OUTPUT_AXIS[n]$

**Description:**
$AN_CEC_OUTPUT_AXIS[n]$: Name of axis to which the output of the compensation table is applied

**Field Limits:**
- **n**: Number of compensation table 0 - (maximum value can be set in MD)

**Identifier:**
- NCK version: 06.00.00

**Unit:**
- run-in
- main run
- runin stop
- Mrun syn
- PP
- SA
- OPI
- OEM

**Access Rights:**
- read: X
- write: X

**Attributes:**
- global
- block search
- link
- Not classified
- No restrictions

### $AN_CEC_STEP[n]$

**Description:**
$AN_CEC_STEP[n]$: Distance of offset values

**Field Limits:**
- **n**: Number of compensation table 0 - (maximum value can be set in MD)

**Identifier:**
- NCK version: 06.00.00

**Unit:**
- run-in
- main run
- runin stop
- Mrun syn
- PP
- SA
- OPI
- OEM

**Access Rights:**
- read: X
- write: X

**Attributes:**
- global
- block search
- link
- Not classified
- No restrictions
### $\text{AN_CEC_MIN}[n]$

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>AN_CEC_MIN[n] Start position of compensation table</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description of field limits:</th>
</tr>
</thead>
<tbody>
<tr>
<td>n: Number of compensation table 0 - (maximum value can be set in MD)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Axis identifier:</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCK version: 06.00.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit:</th>
</tr>
</thead>
<tbody>
<tr>
<td>DBL_MIN</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Access Rights:</th>
</tr>
</thead>
<tbody>
<tr>
<td>PP</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Read:</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Write:</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Attributes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rights:</th>
</tr>
</thead>
<tbody>
<tr>
<td>No classified</td>
</tr>
</tbody>
</table>

### $\text{AN_CEC_MAX}[n]$

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>AN_CEC_MAX[n] End position of compensation table</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description of field limits:</th>
</tr>
</thead>
<tbody>
<tr>
<td>n: Number of compensation table 0 - (maximum value can be set in MD)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Axis identifier:</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCK version: 06.00.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit:</th>
</tr>
</thead>
<tbody>
<tr>
<td>DBL_MIN</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Access Rights:</th>
</tr>
</thead>
<tbody>
<tr>
<td>PP</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Read:</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Write:</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Attributes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rights:</th>
</tr>
</thead>
<tbody>
<tr>
<td>No classified</td>
</tr>
</tbody>
</table>

### $\text{AN_CEC_DIRECTION}[n]$

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\text{AN_CEC_DIRECTION}[n]$ Activates direction-dependent action of compensation table</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description of field limits:</th>
</tr>
</thead>
<tbody>
<tr>
<td>n: Number of compensation table 0 - (maximum value can be set in MD)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Axis identifier:</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCK version: 06.00.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit:</th>
</tr>
</thead>
<tbody>
<tr>
<td>INT_MIN</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Access Rights:</th>
</tr>
</thead>
<tbody>
<tr>
<td>PP</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Read:</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Write:</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Attributes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rights:</th>
</tr>
</thead>
<tbody>
<tr>
<td>No classified</td>
</tr>
</tbody>
</table>
### 1.21 Interpolatory compensation

<table>
<thead>
<tr>
<th></th>
<th><code>$AN_CEC_MULT_BY_TABLE[n]</code></th>
<th>description:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><code>$AN_CEC_MULT_BY_TABLE[n]</code></td>
<td>Number of table whose output value is to be multiplied by the output value of the compensation table.</td>
</tr>
<tr>
<td></td>
<td>0: Both travel directions of basic axis.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1: Positive travel direction of basic axis.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-1: Negative travel direction of basic axis.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>n: Number of compensation table 0 - (maximum value can be set in MD).</td>
<td></td>
</tr>
<tr>
<td>axis identifier:</td>
<td>NCK version: 06.00.00</td>
<td></td>
</tr>
<tr>
<td>unit:</td>
<td>-</td>
<td>FALSE</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin stip</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
</tr>
<tr>
<td></td>
<td>Not classified</td>
<td>No restrictions</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th><code>$AN_CEC_IS_MODULO[n]</code></th>
<th>description:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><code>$AN_CEC_IS_MODULO[n]</code></td>
<td>TRUE: Cyclical repetition of compensation table.</td>
</tr>
<tr>
<td></td>
<td>FALSE: No cyclical repetition of compensation table.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>n: Number of compensation table 0 - (maximum value can be set in MD).</td>
<td></td>
</tr>
<tr>
<td>axis identifier:</td>
<td>NCK version: 06.00.00</td>
<td></td>
</tr>
<tr>
<td>unit:</td>
<td>FALSE</td>
<td>TRUE</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin stip</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
</tr>
<tr>
<td></td>
<td>Not classified</td>
<td>No restrictions</td>
</tr>
</tbody>
</table>
1.22 NCK-specific protection areas

### BOOL $SN_PA_ACTIV_IMMED[n]

**Description:**
Protection zone immediately active after boot
TRUE: The protection zone is activated immediately after the control has booted and the axes have been referenced
FALSE: The protection zone is not immediately active

**Note:** This variable can only be written as a system variable and is not affected by the NC commands between NPROTDEF(,) and EXECUTE(n).

**Note:** This variable is not restored during REORG.

**Note:** This variable is saved during data backup.

**Blocks:** _N_NCK_PRO, _N_COMPLETE_PRO and _N_INITIAL_INI

**Description of field limits:**
- **n:** Number of protection zone

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>run-in</th>
<th>main run</th>
<th>runin slp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>min.</td>
<td>FALSE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>max.</td>
<td>TRUE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Read:** X  X  X  X  7  7

**Write:** X  X  X  X  7  7

**Attributes:** global  block search  link

---

### CHAR $SN_PA_T_W[n]

**Description:**
Protection zone specific to workpiece/tool
0: Workpiece-specific protection zone
3: Tool-specific protection zone

**Note:** This variable is not restored during REORG.

**Note:** This variable is saved during data backup.

**Blocks:** _N_NCK_PRO, _N_COMPLETE_PRO and _N_INITIAL_INI

**Description of field limits:**
- **n:** Number of protection zone

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>run-in</th>
<th>main run</th>
<th>runin slp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>min.</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>max.</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Read:** X  X  X  X  X  X

**Write:** X  X  X  X  X  X

**Attributes:** global  block search  link

---

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SINUMERIK 840D sl/840Di sl/ 840D/ 840Di, List of System Variables (PGA1), 01/2008
### 1.22 NCK-specific protection areas

#### 1. NCK-specific protection areas

- **$SN_PA_ORI[n]**
  - **Description:** Orientation of protection zone
  - **Usage:**
    - 0: Polygon definition in the plane from the 1st and 2nd geo axes (G17)
    - 1: Polygon definition in the plane from the 3rd and 1st geo axes (G18)
    - 2: Polygon definition in the plane from the 2nd and 3rd geo axes (G19)
  - **Note:** This variable is not restored during REORG.
  - **Blocks:** _N_NCK_PRO, _N_COMPLETE_PRO and _N_INITIAL_INI

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>NCK version: 06.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit:</td>
<td>- min.: 0 max.: 2</td>
</tr>
<tr>
<td>run-in main run runin stp Mrun syn PP SA OPI OEM access rights</td>
<td>read: X X X write: X X 7 attributes: global block search link</td>
</tr>
</tbody>
</table>

---

- **$SN_PA_LIM_3DIM[n]**
  - **Description:** Identifier for limitation of protection zone in the axis perpendicular to the polygon definition
  - **Usage:**
    - 0: No limitation
    - 1: Limitation in the positive direction
    - 2: Limitation in the negative direction
    - 3: Limitation in both directions
  - **Note:** This variable is not restored during REORG.
  - **Blocks:** _N_NCK_PRO, _N_COMPLETE_PRO and _N_INITIAL_INI

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>NCK version: 06.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit:</td>
<td>- min.: 0 max.: 3</td>
</tr>
<tr>
<td>run-in main run runin stp Mrun syn PP SA OPI OEM access rights</td>
<td>read: X X X write: X X 7 attributes: global block search link</td>
</tr>
</tbody>
</table>
### 1.22 NCK-specific protection areas

<table>
<thead>
<tr>
<th>DOUBLE</th>
<th>$\text{SN_PA_PLUS_LIM}[n]$</th>
<th>description</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\text{SN_PA_PLUS_LIM}[n]$</td>
<td>Positive limitation of protection zones in the axis perpendicular to the polygon definition</td>
<td></td>
</tr>
<tr>
<td>Effective only if $\text{SN_PA_LIM_3DIM}[n]=1$ or $=3$.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Note: This variable is not restored during REORG.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Note: This variable is saved during data backup.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blocks: _N_NCK_PRO, _N_COMPLETE_PRO and _N_INITIAL_INI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>description of field limits:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>n: Number of protection zone</td>
<td></td>
<td></td>
</tr>
<tr>
<td>axis identifier:</td>
<td>NCK version: 06.00.00</td>
<td></td>
</tr>
<tr>
<td>unit:</td>
<td>mm min.: DBL_MIN max.: DBL_MAX run-in main run runin slip Mrun syn PP SA OPT OEM access rights</td>
<td></td>
</tr>
<tr>
<td>read:</td>
<td>X X X</td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td>X X X 7</td>
<td></td>
</tr>
<tr>
<td>attributes: global block search link</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not classified No restrictions</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DOUBLE</th>
<th>$\text{SN_PA_MINUS_LIM}[n]$</th>
<th>description</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\text{SN_PA_MINUS_LIM}[n]$</td>
<td>Negative limitation of protection zone in minus direction in the axis perpendicular to the polygon definition</td>
<td></td>
</tr>
<tr>
<td>Effective only if $\text{SN_PA_LIM_3DIM}[n]=2$ or $=3$.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Note: This variable is not restored during REORG.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Note: This variable is saved during data backup.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blocks: _N_NCK_PRO, _N_COMPLETE_PRO and _N_INITIAL_INI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>description of field limits:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>n: Number of protection zone</td>
<td></td>
<td></td>
</tr>
<tr>
<td>axis identifier:</td>
<td>NCK version: 06.00.00</td>
<td></td>
</tr>
<tr>
<td>unit:</td>
<td>mm min.: DBL_MIN max.: DBL_MAX run-in main run runin slip Mrun syn PP SA OPT OEM access rights</td>
<td></td>
</tr>
<tr>
<td>read:</td>
<td>X X X</td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td>X X X 7</td>
<td></td>
</tr>
<tr>
<td>attributes: global block search link</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not classified No restrictions</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
1.22 NCK-specific protection areas

INT $SN_PA_CONT_NUM[n]

description:
$SN_PA_CONT_NUM[n]
Number of valid contour elements
Protection zones need at least 2 contour elements for a complete description.

Note: This variable is not restored during REORG.

Note: This variable is saved during data backup.
Blocks: _N_NCK_PRO, _N_COMPLETE_PRO and _N_INITIAL_INI

description of field limits:
n: Number of protection zone
axis identifier:
unit: - min.: 0 max.: 10
run-in main run runin stp Mrun syn PP SA OPI OEM access rights
read: X X X
write: X X X 7
attributes: global block search sink
Not classified No restrictions

INT $SN_PA_CONT_TYP[n,m]

description:
$SN_PA_CONT_TYP[n,m]
Type (G1, G2, G3) of contour element
=0: Contour not defined
=1: Straight
=2: Circle element (clockwise)
=3: Circle element (counterclockwise)
The end point is determined by $SN_PA_CONT_ORD or $SN_PA_CONT_ABS. With contour types G2 and G3, $SN_PA_CENT_ORD or $SN_PA_CENT_ABS determines the center point of the circle element.

Note: This variable is not restored during REORG.

Note: This variable is saved during data backup.
Blocks: _N_NCK_PRO, _N_COMPLETE_PRO and _N_INITIAL_INI

description of field limits:
n: Number of protection zone
m: Number of the contour element
axis identifier:
unit: - min.: 0 max.: 3
run-in main run runin stp Mrun syn PP SA OPI OEM access rights
read: X X X
write: X X X 7
attributes: global block search sink
Not classified No restrictions
### 1 System variable

#### 1.22 NCK-specific protection areas

<table>
<thead>
<tr>
<th>DOUBLE</th>
<th>$SN_PA_CONT_ORD[n,m]$</th>
<th>description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$SN_PA_CONT_ORD[n,m]$</td>
<td>End point of contour element (ordinate)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>See also description of $SN_PA_CONT_TYP$</td>
</tr>
</tbody>
</table>

Note: This variable is not restored during REORG.

Note: This variable is saved during data backup.

Blocks: _N_NCK_PRO, _N_COMPLETE_PRO and _N_INITIAL_INI

<table>
<thead>
<tr>
<th>description of field limits:</th>
</tr>
</thead>
<tbody>
<tr>
<td>n: Number of protection zone</td>
</tr>
<tr>
<td>m: Number of the contour element</td>
</tr>
</tbody>
</table>

<table>
<thead>
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Not classified No restrictions

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Note: This variable is not restored during REORG.

Note: This variable is saved during data backup.

Blocks: _N_NCK_PRO, _N_COMPLETE_PRO and _N_INITIAL_INI

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### 1.22 NCK-specific protection areas

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<td>write:</td>
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### 1.23 Cycle parameterization

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<th>Run-In Sleep</th>
<th>M Run Syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>Access Rights</th>
<th>Read</th>
<th>Write</th>
<th>Attributes</th>
<th>Rights</th>
<th>Classification</th>
<th>Restrictions</th>
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<th>PP</th>
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<th>OPI</th>
<th>OEM</th>
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<th>OPI</th>
<th>OEM</th>
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Value of programmed address D in ISO2/3 mode for cycle parameterization

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<td>attributes:</td>
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### $C_E$

**Description:**
Value of programmed address E in ISO2/3 mode for cycle parameterization

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<td>run-in</td>
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### $C_F$

**Description:**
Value of programmed address F in ISO2/3 mode for cycle parameterization

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<td>run-in</td>
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### DOUBLE \$C_H

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<tr>
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### DOUBLE \$C_i[10]

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<td>Up to 10 entries with address K can be made in the block for macro programming</td>
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<td>Axis Identifier:</td>
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<tr>
<td>Unit:</td>
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<td>Run-in Main Run Runin Stp Mrun Syn PP SA OPT OEM Access Rights</td>
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Not classified No restrictions
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**Description:**
Value of programmed address J in ISO2/3 mode for cycle parameterization and macro programming with G65/G66.

**Field limits:**
Up to 10 entries with address K can be made in the block for macro programming.

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<th>Unit</th>
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<th>Main run</th>
<th>Runin Slip</th>
<th>Mrun Syn</th>
<th>PP</th>
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### $C_K[10]$

**Description:**
Value of programmed address K in ISO2/3 mode for cycle parameterization and macro programming with G65/G66.

**Field limits:**
Up to 10 entries with address K can be made in the block for macro programming.

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<th>Mrun Syn</th>
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<th>Access rights</th>
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### $C_L$

**Description:**
Value of programmed address L in ISO2/3 mode for cycle parameterization

**Field limits:**

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<th>Unit</th>
<th>Run-in</th>
<th>Main run</th>
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### System Variables

#### 1.23 Cycle Parameterization

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## 1.23 Cycle parameterization

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<th>Main Run</th>
<th>Runin Stp</th>
<th>Mrun Syn</th>
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<td>runin stp</td>
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<th>Unit</th>
<th>NCK Version</th>
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<th>Main Run</th>
<th>Runin Stp</th>
<th>Mrun Syn</th>
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<th>Run-in</th>
<th>Main Run</th>
<th>Runin Stp</th>
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### System variable

#### 1.23 Cycle parameterization

**$C_S$**

**Value of programmed address S in ISO2/3 mode for cycle parameterization**

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**$C_T$**

**Value of programmed address T for cycle parameterization (ISO2/3 mode) and T function substitution (ISO2/3 and standard modes)**

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**$C_U$**

**Value of programmed address U in ISO2/3 mode for cycle parameterization**

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</thead>
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<td></td>
</tr>
<tr>
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<td>X</td>
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<tr>
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<td>No restrictions</td>
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</table>
### $C_V$

**Description:**
Value of programmed address V in ISO2/3 mode for cycle parameterization.

**Axis Identifier:** NCK version: 17.00.00

**Unit:** DBL_MIN - DBL_MAX

**Read:** X
**Write:** X

**Attributes:**
- Global
- Block search
- Link

**Access:**
- Rights: XX
- Read: XX
- Write: 7

**Not classified**
No restrictions

### $C_W$

**Description:**
Value of programmed address W in ISO2/3 mode for cycle parameterization.

**Axis Identifier:** NCK version: 17.00.00

**Unit:** DBL_MIN - DBL_MAX

**Read:** X
**Write:** X

**Attributes:**
- Global
- Block search
- Link

**Access:**
- Rights: XX
- Read: XX
- Write: 7

**Not classified**
No restrictions

### $C_X$

**Description:**
Value of programmed address X in ISO2/3 mode for cycle parameterization.

**Axis Identifier:** NCK version: 17.00.00

**Unit:** DBL_MIN - DBL_MAX

**Read:** X
**Write:** X

**Attributes:**
- Global
- Block search
- Link

**Access:**
- Rights: XX
- Read: XX
- Write: 7

**Not classified**
No restrictions
### DOUBLE $C_Y$

**Description:**
Value of programmed address Y in ISO2/3 mode for cycle parameterization

**Axis identifier:**
- NCK version: 17.00.00

**Unit:**
- DBL_MIN to DBL_MAX

**Run-in main run runin stp Mrun syn PP SA OPT OEM access rights**
- read: X
- write: X

**Attributes:**
- global
- block
- search
- link
- Not classified
- No restrictions

### DOUBLE $C_Z$

**Description:**
Value of programmed address Z in ISO2/3 mode for cycle parameterization

**Axis identifier:**
- NCK version: 17.00.00

**Unit:**
- DBL_MIN to DBL_MAX

**Run-in main run runin stp Mrun syn PP SA OPT OEM access rights**
- read: X
- write: X

**Attributes:**
- global
- block
- search
- link
- Not classified
- No restrictions

### DOUBLE $C_DL$

**Description:**
Value of programmed address DL (additive tool offset) in the case of a subprogram call by M/T function substitution

**Axis identifier:**
- NCK version: 43.00.00

**Unit:**
- DBL_MIN to DBL_MAX

**Run-in main run runin stp Mrun syn PP SA OPT OEM access rights**
- read: X
- write: X

**Attributes:**
- global
- block
- search
- link
- Not classified
- No restrictions
### 1.23 Cycle parameterization

#### $\text{\textdollar}C\_\text{PI}$

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<th>Main run</th>
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#### $\text{\textdollar}C\_\text{TS}[-1]$ (T function substitution (with active tool monitoring only))

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#### $\text{\textdollar}C\_A\_\text{PROG}$

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1 System variable

1.23 Cycle parameterization

INT $C_B_PROG

description:

$C_B_PROG
Address B is programmed in a block with cycle call
0 = Not programmed
1 = Programmed
3 = Programmed incrementally
Bit 0 is set if the address is programmed absolutely or incrementally.
Bit 1 is set in addition if the address is programmed incrementally.

axis identifier: NCK version: 17.00.00
unit: - min.: max.: run-in main run runin stp Mrun syn PP SA OPI OEM access rights
read: X X
write: X 7
attributes: global block search smk

INT $C_C_PROG

description:

$C_C_PROG
Address C is programmed in a block with cycle call
0 = Not programmed
1 = Programmed
3 = Programmed incrementally
Bit 0 is set if the address is programmed absolutely or incrementally.
Bit 1 is set in addition if the address is programmed incrementally.

axis identifier: NCK version: 17.00.00
unit: - min.: max.: run-in main run runin stp Mrun syn PP SA OPI OEM access rights
read: X X
write: X 7
attributes: global block search smk

Not classified No restrictions
### $C_D_PROG

**description:**

Address D is programmed in a block with cycle call:
- 0 = Not programmed
- 1 = Programmed
- 3 = Programmed incrementally

Bit 0 is set if the address is programmed absolutely or incrementally. Bit 1 is set in addition if the address is programmed incrementally.

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<td>Mrun syn</td>
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<tr>
<td>write:</td>
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**attributes:** global, block search, link

- Not classified
- No restrictions

### $C_E_PROG

**description:**

Address E is programmed in a block with cycle call:
- 0 = Not programmed
- 1 = Programmed
- 3 = Programmed incrementally

Bit 0 is set if the address is programmed absolutely or incrementally. Bit 1 is set in addition if the address is programmed incrementally.

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**attributes:** global, block search, link

- Not classified
- No restrictions
### $C\_F\_PROG$

**Description:**

$C\_F\_PROG$

Address F is programmed in a block with cycle call

- **0** = Not programmed
- **1** = Programmed
- **3** = Programmed incrementally

Bit 0 is set if the address is programmed absolutely or incrementally.
Bit 1 is set in addition if the address is programmed incrementally.

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**Attributes:**
- Global
- Block search
- Link

- Not classified
- No restrictions

### $C\_G\_PROG$

**Description:**

$C\_G\_PROG$

G function for cycle call is programmed in this block

- **0** = Not programmed
- **1** = Programmed
- **3** = Programmed incrementally

Bit 0 is set if the address is programmed absolutely or incrementally.
Bit 1 is set in addition if the address is programmed incrementally.

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<td></td>
</tr>
<tr>
<td>write</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td>7</td>
</tr>
</tbody>
</table>

**Attributes:**
- Global
- Block search
- Link

- Not classified
- No restrictions
### 1.23 Cycle parameterization

#### INT $C_H_PROG

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$C_H_PROG</td>
</tr>
<tr>
<td>Address H is programmed in a block with cycle call</td>
</tr>
<tr>
<td>0 = Not programmed</td>
</tr>
<tr>
<td>1 = Programmed</td>
</tr>
<tr>
<td>3 = Programmed incrementally</td>
</tr>
<tr>
<td>Bit 0 is set if the address is programmed absolutely or incrementally.</td>
</tr>
<tr>
<td>Bit 1 is set in addition if the address is programmed incrementally.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Identifier:</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCK version: 17.00.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit:</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in main run runin stp Mrun syn PP SA OPI OEM access rights</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Read:</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Write:</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Attributes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>global block search sink</td>
</tr>
</tbody>
</table>

Not classified No restrictions

#### INT $C_I_PROG

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$C_I_PROG</td>
</tr>
<tr>
<td>Address I is programmed in a block with cycle macro call</td>
</tr>
<tr>
<td>0 = Not programmed</td>
</tr>
<tr>
<td>1 = Programmed</td>
</tr>
<tr>
<td>3 = Programmed incrementally</td>
</tr>
<tr>
<td>Bit 0 is set if the address is programmed absolutely or incrementally.</td>
</tr>
<tr>
<td>Bit 1 is set in addition if the address is programmed incrementally.</td>
</tr>
</tbody>
</table>

<table>
<thead>
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<th>Identifier:</th>
</tr>
</thead>
<tbody>
<tr>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit:</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in main run runin stp Mrun syn PP SA OPI OEM access rights</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Read:</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Write:</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Attributes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>global block search sink</td>
</tr>
</tbody>
</table>

Not classified No restrictions
### $\$C_J_PROG$

**Description:**

Address J is programmed in a block with cycle macro call

- **0** = Not programmed
- **1** = Programmed
- **3** = Programmed incrementally

Bit 0 is set if the address is programmed absolutely or incrementally. Bit 1 is set in addition if the address is programmed incrementally.

<table>
<thead>
<tr>
<th>Unit identifier:</th>
<th>NCK version:</th>
<th>17.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Access Rights</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Read:</strong></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Write:</strong></td>
<td>X</td>
<td>7</td>
</tr>
</tbody>
</table>

### $\$C_K_PROG$

**Description:**

Address K is programmed in a block with cycle macro call

- **0** = Not programmed
- **1** = Programmed
- **3** = Programmed incrementally

Bit 0 is set if the address is programmed absolutely or incrementally. Bit 1 is set in addition if the address is programmed incrementally.

<table>
<thead>
<tr>
<th>Unit identifier:</th>
<th>NCK version:</th>
<th>17.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Access Rights</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Read:</strong></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Write:</strong></td>
<td>X</td>
<td>7</td>
</tr>
</tbody>
</table>

Not classified No restrictions
### $C_L_PROG

**Description:**

$C_L_PROG

Address L is programmed in a block with cycle call

- 0 = Not programmed
- 1 = Programmed
- 3 = Programmed incrementally

Bit 0 is set if the address is programmed absolutely or incrementally.
Bit 1 is set in addition if the address is programmed incrementally.

**Axis Identifier:**

- NCK version: 17.00.00

**Unit:**

- MIN.:  
- MAX.: 

**Read:** X

**Write:** X

**Attributes:**

- Global
- Block search

**Access Rights:**

- Not classified
- No restrictions

---

### $C_M_PROG

**Description:**

$C_M_PROG

Address M is programmed in a block with cycle call

- 0 = Not programmed
- 1 = Programmed
- 3 = Programmed incrementally

Bit 0 is set if the address is programmed absolutely or incrementally.
Bit 1 is set in addition if the address is programmed incrementally.

**Axis Identifier:**

- NCK version: 17.00.00

**Unit:**

- MIN.:  
- MAX.: 

**Read:** X

**Write:** X

**Attributes:**

- Global
- Block search

**Access Rights:**

- Not classified
- No restrictions
### $\$C\_N\_PROG$

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address ( N ) is programmed in a block with cycle call</td>
</tr>
<tr>
<td>0 = Not programmed</td>
</tr>
<tr>
<td>1 = Programmed</td>
</tr>
<tr>
<td>3 = Programmed incrementally</td>
</tr>
<tr>
<td>Bit 0 is set if the address is programmed absolutely or incrementally.</td>
</tr>
<tr>
<td>Bit 1 is set in addition if the address is programmed incrementally.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Axis Identifier:</th>
<th>NCK Version: 17.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Run-in</td>
<td>Min.:</td>
</tr>
<tr>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Main Run</td>
<td>Run-in Stp</td>
</tr>
<tr>
<td>Read:</td>
<td>X</td>
</tr>
<tr>
<td>Write:</td>
<td>X</td>
</tr>
</tbody>
</table>

### $\$C\_O\_PROG$

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address ( O ) is programmed in a block with cycle call</td>
</tr>
<tr>
<td>0 = Not programmed</td>
</tr>
<tr>
<td>1 = Programmed</td>
</tr>
<tr>
<td>3 = Programmed incrementally</td>
</tr>
<tr>
<td>Bit 0 is set if the address is programmed absolutely or incrementally.</td>
</tr>
<tr>
<td>Bit 1 is set in addition if the address is programmed incrementally.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Axis Identifier:</th>
<th>NCK Version: 17.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Run-in</td>
<td>Min.:</td>
</tr>
<tr>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Main Run</td>
<td>Run-in Stp</td>
</tr>
<tr>
<td>Read:</td>
<td>X</td>
</tr>
<tr>
<td>Write:</td>
<td>X</td>
</tr>
</tbody>
</table>
### INT $C_P_PROG

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$C_P_PROG</td>
</tr>
<tr>
<td>Address P is programmed in a block with cycle call</td>
</tr>
<tr>
<td>0 = Not programmed</td>
</tr>
<tr>
<td>1 = Programmed</td>
</tr>
<tr>
<td>3 = Programmed incrementally</td>
</tr>
<tr>
<td>Bit 0 is set if the address is programmed absolutely or incrementally.</td>
</tr>
<tr>
<td>Bit 1 is set in addition if the address is programmed incrementally.</td>
</tr>
</tbody>
</table>

#### Axis identifier:
- **NCK version:** 17.00.00
- **Unit:** -
- **Run-in:** min.: max.: run: run: stp Mrun syn PP SA OPI OEM access
- **Read:** X
- **Write:** X

#### Attributes:
- global
- block search
- link

- Not classified
- No restrictions

### INT $C_Q_PROG

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$C_Q_PROG</td>
</tr>
<tr>
<td>Address Q is programmed in a block with cycle call</td>
</tr>
<tr>
<td>0 = Not programmed</td>
</tr>
<tr>
<td>1 = Programmed</td>
</tr>
<tr>
<td>3 = Programmed incrementally</td>
</tr>
<tr>
<td>Bit 0 is set if the address is programmed absolutely or incrementally.</td>
</tr>
<tr>
<td>Bit 1 is set in addition if the address is programmed incrementally.</td>
</tr>
</tbody>
</table>

#### Axis identifier:
- **NCK version:** 17.00.00
- **Unit:** -
- **Run-in:** min.: max.: run: run: stp Mrun syn PP SA OPI OEM access
- **Read:** X
- **Write:** X

#### Attributes:
- global
- block search
- link

- Not classified
- No restrictions
### $C_R_PROG

**description:**
Address R is programmed in a block with cycle call
0 = Not programmed
1 = Programmed
3 = Programmed incrementally

Bit 0 is set if the address is programmed absolutely or incrementally.
Bit 1 is set in addition if the address is programmed incrementally.

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>NCK version</th>
<th>17.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit:</td>
<td>run-in</td>
<td>main run</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### $C_S_PROG

**description:**
Address S is programmed in a block with cycle call
0 = Not programmed
1 = Programmed
3 = Programmed incrementally

Bit 0 is set if the address is programmed absolutely or incrementally.
Bit 1 is set in addition if the address is programmed incrementally.

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>NCK version</th>
<th>17.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit:</td>
<td>run-in</td>
<td>main run</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### $C_T_PROG

**Address T is programmed in a block with cycle call or T function substitution**

- 0 = Not programmed
- 1 = Programmed
- 3 = Programmed incrementally

Bit 0 is set if the address is programmed absolutely or incrementally. Bit 1 is set in addition if the address is programmed incrementally.

<table>
<thead>
<tr>
<th>axis</th>
<th>identifier:</th>
<th>NCK version:</th>
<th>17.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit:</td>
<td>min.:</td>
<td>max.:</td>
<td>run-in</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Attributes:** global, block search, link

- Not classified
- No restrictions

---

### $C_U_PROG

**Address U is programmed in the current block**

- 0 = Not programmed
- 1 = Programmed
- 3 = Programmed incrementally

Bit 0 is set if the address is programmed absolutely or incrementally. Bit 1 is set in addition if the address is programmed incrementally.

<table>
<thead>
<tr>
<th>axis</th>
<th>identifier:</th>
<th>NCK version:</th>
<th>17.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit:</td>
<td>min.:</td>
<td>max.:</td>
<td>run-in</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Attributes:** global, block search, link

- Not classified
- No restrictions
### $C_V_PROG

<table>
<thead>
<tr>
<th>Description:</th>
<th>$C_V_PROG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address V is programmed in a block with cycle call.</td>
<td></td>
</tr>
<tr>
<td>0 = Not programmed</td>
<td></td>
</tr>
<tr>
<td>1 = Programmed</td>
<td></td>
</tr>
<tr>
<td>3 = Programmed incrementally</td>
<td></td>
</tr>
<tr>
<td>Bit 0 is set if the address is programmed absolutely or incrementally.</td>
<td></td>
</tr>
<tr>
<td>Bit 1 is set in addition if the address is programmed incrementally.</td>
<td></td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Axis Identifier:</th>
<th>NCK Version:</th>
</tr>
</thead>
<tbody>
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<td>-</td>
<td>17.00.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit:</th>
<th>Min.:</th>
<th>Max.:</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin stp</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td>7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Attributes:</th>
<th>global</th>
<th>block search</th>
<th>smk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not classified</td>
<td>No restrictions</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### $C_W_PROG

<table>
<thead>
<tr>
<th>Description:</th>
<th>$C_W_PROG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address W is programmed in a block with cycle call.</td>
<td></td>
</tr>
<tr>
<td>0 = Not programmed</td>
<td></td>
</tr>
<tr>
<td>1 = Programmed</td>
<td></td>
</tr>
<tr>
<td>3 = Programmed incrementally</td>
<td></td>
</tr>
<tr>
<td>Bit 0 is set if the address is programmed absolutely or incrementally.</td>
<td></td>
</tr>
<tr>
<td>Bit 1 is set in addition if the address is programmed incrementally.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Axis Identifier:</th>
<th>NCK Version:</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>17.00.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit:</th>
<th>Min.:</th>
<th>Max.:</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin stp</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td>7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Attributes:</th>
<th>global</th>
<th>block search</th>
<th>smk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not classified</td>
<td>No restrictions</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### $C\_X\_PROG$

**Address X is programmed in a block with cycle call**

- **0** = Not programmed
- **1** = Programmed
- **3** = Programmed incrementally

Bit 0 is set if the address is programmed absolutely or incrementally.
Bit 1 is set in addition if the address is programmed incrementally.

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>NCK version</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>17.00.00</td>
</tr>
</tbody>
</table>

**Unit**

<table>
<thead>
<tr>
<th>run-in</th>
<th>main run</th>
<th>runin stp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Read**

|          | X        | X         |         |    |    |     |     |               |

**Write**

|          | X        | X         |         |    |    |     |     |               |

**Attributes**

- Global
- Block search
- Read: XX
- Write: XX 7
- Not classified
- No restrictions

### $C\_Y\_PROG$

**Address Y is programmed in a block with cycle call**

- **0** = Not programmed
- **1** = Programmed
- **3** = Programmed incrementally

Bit 0 is set if the address is programmed absolutely or incrementally.
Bit 1 is set in addition if the address is programmed incrementally.

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>NCK version</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>17.00.00</td>
</tr>
</tbody>
</table>

**Unit**

<table>
<thead>
<tr>
<th>run-in</th>
<th>main run</th>
<th>runin stp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Read**

|          | X        | X         |         |    |    |     |     |               |

**Write**

|          | X        | X         |         |    |    |     |     |               |

**Attributes**

- Global
- Block search
- Read: XX
- Write: XX 7
- Not classified
- No restrictions
### $C\_Z\_PROG$

**Description:**
Address Z is programmed in a block with cycle call

- **Value:**
  - `0` = Not programmed
  - `1` = Programmed
  - `3` = Programmed incrementally

- Bit 0 is set if the address is programmed absolutely or incrementally.
- Bit 1 is set in addition if the address is programmed incrementally.

**Axis Identifier:**
NCK version: 17.00.00

**Unit:**
- `run-in`
- `main run`
- `runin stp`
- `Mrun syn`

**Right:**
- `read`: X
- `write`: X

**Attributes:**
- `global`
- `block search`
- `link`

### $C\_PI\_PROG$

**Description:**
0 = Not programmed
1 = M96 Pxx interrupt routine programmed

**Axis Identifier:**
NCK version: 52.00.00

**Unit:**
- `run-in`
- `main run`
- `runin stp`
- `Mrun syn`

**Right:**
- `read`: X
- `write`: X

**Attributes:**
- `global`
- `block search`
- `link`

### $C\_G60\_PROG$

**Description:**
0 = not programmed
1 = G60 is programmed in the cycle call block

**Axis Identifier:**
NCK version: 67.00.00

**Unit:**
- `run-in`
- `main run`
- `runin stp`
- `Mrun syn`

**Right:**
- `read`: X
- `write`: X

**Attributes:**
- `global`
- `block search`
- `link`
### `$C_DL_PROG`

**Description:**
Interrogation as to whether address DL (additive tool offset) has been programmed for a subprogram call per M/T function substitution.

- 0 = Not programmed
- 1 = An additive tool offset has been programmed under address DL.

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>NCK Version: 43.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Run-in</td>
<td>X</td>
</tr>
<tr>
<td>Main Run</td>
<td>X</td>
</tr>
<tr>
<td>Run-in Stop</td>
<td>X</td>
</tr>
<tr>
<td>PP</td>
<td></td>
</tr>
<tr>
<td>SA</td>
<td></td>
</tr>
<tr>
<td>OPI</td>
<td></td>
</tr>
<tr>
<td>OEM</td>
<td></td>
</tr>
<tr>
<td>Access Rights</td>
<td></td>
</tr>
<tr>
<td>Read:</td>
<td>XX</td>
</tr>
<tr>
<td>Write:</td>
<td>XX 7</td>
</tr>
<tr>
<td>Attributes</td>
<td>Global Block Search Link</td>
</tr>
</tbody>
</table>

### `$C_TS_PROG`

**Description:**
Interrogation as to whether a tool identifier has been programmed under address T for a subprogram call per T function substitution.

(With active tool monitoring only)

- 0 = Not programmed
- 1 = Programmed

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>NCK Version: 18.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Run-in</td>
<td>X</td>
</tr>
<tr>
<td>Main Run</td>
<td>X</td>
</tr>
<tr>
<td>Run-in Stop</td>
<td>X</td>
</tr>
<tr>
<td>PP</td>
<td></td>
</tr>
<tr>
<td>SA</td>
<td></td>
</tr>
<tr>
<td>OPI</td>
<td></td>
</tr>
<tr>
<td>OEM</td>
<td></td>
</tr>
<tr>
<td>Access Rights</td>
<td></td>
</tr>
<tr>
<td>Read:</td>
<td>XX</td>
</tr>
<tr>
<td>Write:</td>
<td>XX 7</td>
</tr>
<tr>
<td>Attributes</td>
<td>Global Block Search Link</td>
</tr>
</tbody>
</table>

### `$C_ALL_PROG`

**Description:**
Bit pattern of all programmed addresses in a block with cycle call

Bit0 = Address "A" .... Bit25 = Address "Z"

- Bit = 1 -> Address programmed
- Bit = 0 -> Address not programmed

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>NCK Version: 17.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Run-in</td>
<td>X</td>
</tr>
<tr>
<td>Main Run</td>
<td>X</td>
</tr>
<tr>
<td>Run-in Stop</td>
<td>X</td>
</tr>
<tr>
<td>PP</td>
<td></td>
</tr>
<tr>
<td>SA</td>
<td></td>
</tr>
<tr>
<td>OPI</td>
<td></td>
</tr>
<tr>
<td>OEM</td>
<td></td>
</tr>
<tr>
<td>Access Rights</td>
<td></td>
</tr>
<tr>
<td>Read:</td>
<td>XX</td>
</tr>
<tr>
<td>Write:</td>
<td>XX 7</td>
</tr>
<tr>
<td>Attributes</td>
<td>Global Block Search Link</td>
</tr>
</tbody>
</table>
### $C\_INC\_PROG$

**Description:**
Bit pattern of all incrementally programmed addresses in a block with cycle call

- Bit0 = Address "A"
- Bit25 = Address "Z"

- Bit = 1 -> Address incrementally programmed
- Bit = 0 -> Address absolutely programmed

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>Min.</th>
<th>Max.</th>
<th>INT_MIN</th>
<th>INT_MAX</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>Run-in</td>
<td>Main Run</td>
<td>Run-in Slip</td>
<td>Mrun Syn</td>
<td>PP</td>
<td>SA</td>
</tr>
<tr>
<td>Read</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Write</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Attributes:**
- Global
- Block Search

- Link

**Access Rights:**
- Not classified
- No restrictions

---

### $C\_TYP\_PROG$

**Description:**
Bit pattern of all addresses programmed with value INT or REAL

- Bit0 = Address "A"
- Bit25 = Address "Z"

- Bit = 1 -> Address programmed with real value
- Bit = 0 -> Address programmed with int value

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>Min.</th>
<th>Max.</th>
<th>INT_MIN</th>
<th>INT_MAX</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>Run-in</td>
<td>Main Run</td>
<td>Run-in Slip</td>
<td>Mrun Syn</td>
<td>PP</td>
<td>SA</td>
</tr>
<tr>
<td>Read</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Write</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Attributes:**
- Global
- Block Search

- Link

**Access Rights:**
- Not classified
- No restrictions

---

### $C\_I\_NUM$

**Description:**
The number of "I" addresses programmed in the block is stored in $C\_I\_NUM.$

This value is always 1 for cycle programming if bit 0 is set in $C\_I\_PROG.$

In the case of macro programming with G65/G66, this variable contains the number of "I" addresses programmed in the block (max. 10).

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>Min.</th>
<th>Max.</th>
<th>INT_MIN</th>
<th>INT_MAX</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>Run-in</td>
<td>Main Run</td>
<td>Run-in Slip</td>
<td>Mrun Syn</td>
<td>PP</td>
<td>SA</td>
</tr>
<tr>
<td>Read</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Write</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Attributes:**
- Global
- Block Search

- Link

**Access Rights:**
- Not classified
- No restrictions
### $\text{C\_J\_NUM}$

**Description:**

The number of "J" addresses programmed in the block is stored in $\text{C\_J\_NUM}$. This value is always 1 for cycle programming if bit 0 is set in $\text{C\_J\_PROG}$.

In the case of macro programming with G65/G66, this variable contains the number of "J" addresses programmed in the block (max. 10).

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>NCK Version</th>
<th>INT_MIN</th>
<th>INT_MAX</th>
<th>ACCESS RIGHTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Run-in</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Main Run</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Run-in Slip</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>M-run Syn</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>PP</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>SA</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>OPT</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>OEM</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Read/Write</td>
<td>XX</td>
<td>XX</td>
<td>7</td>
<td></td>
</tr>
</tbody>
</table>

Attributes:
- Global
- Block Search
- Link

### $\text{C\_K\_NUM}$

**Description:**

The number of "K" addresses programmed in the block is stored in $\text{C\_K\_NUM}$. This value is always 1 for cycle programming if bit 0 is set in $\text{C\_K\_PROG}$.

In the case of macro programming with G65/G66, this variable contains the number of "K" addresses programmed in the block (max. 10).

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>NCK Version</th>
<th>INT_MIN</th>
<th>INT_MAX</th>
<th>ACCESS RIGHTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Run-in</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Main Run</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Run-in Slip</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>M-run Syn</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>PP</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>SA</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>OPT</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>OEM</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Read/Write</td>
<td>XX</td>
<td>XX</td>
<td>7</td>
<td></td>
</tr>
</tbody>
</table>

Attributes:
- Global
- Block Search
- Link

Not Classified: No restrictions
### $C_I\_ORDER[10]$

**Description:**
Number of IJK block in which I has been programmed.

Up to 10 entries with address I can be made in the block for macro programming with G65/G66. This allows the sequence of IJK blocks to be evaluated.

The association between IJK blocks is always noted.

**Description of Field Limits:**
Up to 10 entries with address K can be made in the block for macro programming.

**Axis Identifier:**
NCK version: 49.00.00

<table>
<thead>
<tr>
<th>Unit</th>
<th>Min.:</th>
<th>Max.:</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>DBL_MIN</td>
<td>DBL_MAX</td>
</tr>
<tr>
<td>main run</td>
<td>runin slp</td>
<td>Mrun syn</td>
</tr>
<tr>
<td>PP</td>
<td>SA</td>
<td>OPI</td>
</tr>
</tbody>
</table>

**Access Rights:**
- read: XX
- write: XX 7

**Attributes:**
- global
- block search
- link

Not classified
No restrictions

### $C_J\_ORDER[10]$

**Description:**
Number of IJK block in which J has been programmed.

Up to 10 entries with address J can be made in the block for macro programming with G65/G66. This allows the sequence of IJK blocks to be evaluated.

The association between IJK blocks is always noted.

**Description of Field Limits:**
Up to 10 entries with address K can be made in the block for macro programming.

**Axis Identifier:**
NCK version: 49.00.00

<table>
<thead>
<tr>
<th>Unit</th>
<th>Min.:</th>
<th>Max.:</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>DBL_MIN</td>
<td>DBL_MAX</td>
</tr>
<tr>
<td>main run</td>
<td>runin slp</td>
<td>Mrun syn</td>
</tr>
<tr>
<td>PP</td>
<td>SA</td>
<td>OPI</td>
</tr>
</tbody>
</table>

**Access Rights:**
- read: XX
- write: XX 7

**Attributes:**
- global
- block search
- link

Not classified
No restrictions
### 1.23 Cycle parameterization

#### $C_K\_ORDER[10]

**Description:**

$C_K\_ORDER[]$

Number of IJK block in which K has been programmed.

Up to 10 entries with address K can be made in the block for macro programming with G65/G66. This allows the sequence of IJK blocks to be evaluated. The association between IJK blocks is always noted.

**Description of field limits:**

Up to 10 entries with address K can be made in the block for macro programming.

<table>
<thead>
<tr>
<th>Axis identifier: NCK version: 49.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>min.: DBL_MIN max.: DBL_MAX min.: DBL_MIN max.: DBL_MAX min.: DBL_MIN max.: DBL_MAX min.: DBL_MIN max.: DBL_MAX min.: DBL_MIN max.: DBL_MAX min.: DBL_MIN max.: DBL_MAX</td>
</tr>
<tr>
<td>read: X X X X X X X X X</td>
</tr>
<tr>
<td>write: X X X X X X X X X</td>
</tr>
<tr>
<td>Attributes: global block search link</td>
</tr>
<tr>
<td>Not classified No restrictions</td>
</tr>
</tbody>
</table>

#### $C\_ME$

**Description:**

$C\_ME$

Address extension for address M for subprogram call per M function.

<table>
<thead>
<tr>
<th>Axis identifier: NCK version: 42.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>min.: - max.: DBL_MAX min.: DBL_MIN max.: DBL_MAX min.: DBL_MIN max.: DBL_MAX min.: DBL_MIN max.: DBL_MAX min.: DBL_MIN max.: DBL_MAX</td>
</tr>
<tr>
<td>read: X X X X X X X X X</td>
</tr>
<tr>
<td>write: X X X X X X X X X</td>
</tr>
<tr>
<td>Attributes: global block search link</td>
</tr>
<tr>
<td>Not classified No restrictions</td>
</tr>
</tbody>
</table>

#### $C\_TE$

**Description:**

$C\_TE$

Address extension for address T for subprogram call per M function.

<table>
<thead>
<tr>
<th>Axis identifier: NCK version: 42.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>min.: - max.: DBL_MAX min.: DBL_MIN max.: DBL_MAX min.: DBL_MIN max.: DBL_MAX min.: DBL_MIN max.: DBL_MAX min.: DBL_MIN max.: DBL_MAX</td>
</tr>
<tr>
<td>read: X X X X X X X X X</td>
</tr>
<tr>
<td>write: X X X X X X X X X</td>
</tr>
<tr>
<td>Attributes: global block search link</td>
</tr>
<tr>
<td>Not classified No restrictions</td>
</tr>
</tbody>
</table>
### 1.24 System data

<table>
<thead>
<tr>
<th>DOUBLE</th>
<th>$C_MACPAR[33]$</th>
</tr>
</thead>
<tbody>
<tr>
<td>description:</td>
<td>$MAC_PAR[n]$</td>
</tr>
<tr>
<td>Macro variable in Iso2/3 mode programmed in the original program with #&lt;number&gt;</td>
<td></td>
</tr>
<tr>
<td>description of field limits:</td>
<td></td>
</tr>
<tr>
<td>The maximum number of ISO macroparameters is 33</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>axis</th>
<th>identifier:</th>
<th>NCK version:</th>
<th>47.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit:</td>
<td>min.:</td>
<td>DBL_MIN</td>
<td>max.:</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin slp</td>
<td>Mrun syn</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
<td>link</td>
</tr>
<tr>
<td></td>
<td>Not classified</td>
<td>No restrictions</td>
<td></td>
</tr>
</tbody>
</table>

### 1.24 System data

<table>
<thead>
<tr>
<th>DOUBLE</th>
<th>$AN_SETUP_TIME$</th>
</tr>
</thead>
<tbody>
<tr>
<td>description:</td>
<td>The $AN_SETUP_TIME$ timer counts the time elapsed since the control last booted with default values (in minutes). The timer is automatically reset each time the control boots with default data.</td>
</tr>
</tbody>
</table>

Use in NC program:
**IF $AN\_SETUP\_TIME> 60000 GOTOOF MARK01**

<table>
<thead>
<tr>
<th>axis</th>
<th>identifier:</th>
<th>NCK version:</th>
<th>19.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit:</td>
<td>min.:</td>
<td>DBL_MIN</td>
<td>max.:</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin slp</td>
<td>Mrun syn</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
<td>link</td>
</tr>
<tr>
<td></td>
<td>Current value</td>
<td>No restrictions</td>
<td></td>
</tr>
</tbody>
</table>
### $AN\_POWERON\_TIME$

**Description:**
The $AN\_POWERON\_TIME$ timer counts the time elapsed since the control last booted (in minutes). The timer is automatically reset each time the control boots.

**Use in NC program:**
```plaintext
IF $AN\_POWERON\_TIME == 480 GOTOF MARK02
```

**Attributes:**
- Global
- Block search
- Link

**Access Rights:**
- Read: XXX XXXX
- Write: XXX XXXX

---

### $AN\_NCK\_VERSION$

**Description:**
NCK version
NCK version: only the integer places in the floating-point number are evaluated, the decimal places can contain identifiers for intermediate versions used by the development department. The integer places contain the official software version identifier of the NCK: For example, the value for NCK version 20.00.00 is variable 200000.0

**Use in NC program:**
```plaintext
compare OPI N/Y nckVersion
```

**Attributes:**
- Global
- Block search
- Link

**Access Rights:**
- Read: XX XXXX
- Write:

---

### $AN\_IPO\_LOAD\_LIMIT$

**Description:**
Variable $AN\_IPO\_LOAD\_LIMIT$ returns TRUE when the interpolator load limit is reached. Machine data $MN\_IPO\_MAX\_LOAD$ is used to specify the gross interpolator operating time (in % of the interpolation cycle) at which variable $AN\_IPO\_LOAD\_LIMIT$ is set to TRUE. If the value falls below the limit again, the variable is reset to FALSE.

**Use in NC program:**
```plaintext
```

**Attributes:**
- Global
- Block search
- Link

**Access Rights:**
- Read: XX XX X
- Write: X X X X X X

---

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SINUMERIK 840D sl/840Di sl/ 840D/ 840Di, List of System Variables (PGA1), 01/2008
### $\textsf{SAN\_IPO\_ACT\_LOAD}$

**Description:**
$\textsf{SAN\_IPO\_ACT\_LOAD}$ supplies the current interpolator runtime including the runtime of the synchronized actions in all channels.

**Axis Identifier:**
- NCK version: 54.00.00
- Unit: DBL_MIN
- Run-in: main run/runin stp/Mrun syn
- Read: X
- Write: X
- Attributes: global/block/search/link
- Rights: Not classified/

**Unit:**
- Min.: DBL_MIN
- Max.: DBL_MAX
- Access rights: read: X XXX write: X X X X

### $\textsf{SAN\_IPO\_MAX\_LOAD}$

**Description:**
$\textsf{SAN\_IPO\_MAX\_LOAD}$ supplies the longest interpolator runtime of one interpolation cycle (including the runtime of the synchronized actions).

**Axis Identifier:**
- NCK version: 54.00.00
- Unit: DBL_MIN
- Run-in: main run/runin stp/Mrun syn
- Read: X X
- Write: X X X X
- Attributes: global/block/search/link
- Rights: Not classified/

**Unit:**
- Min.: DBL_MIN
- Max.: DBL_MAX
- Access rights: read: X X write: X X X X

### $\textsf{SAN\_IPO\_MIN\_LOAD}$

**Description:**
$\textsf{SAN\_IPO\_MIN\_LOAD}$ supplies the shortest interpolator runtime including the runtime of the synchronized actions per interpolation cycle in all channels.

**Axis Identifier:**
- NCK version: 54.00.00
- Unit: DBL_MIN
- Run-in: main run/runin stp/Mrun syn
- Read: X X
- Write: X X X X
- Attributes: global/block/search/link
- Rights: Not classified/

**Unit:**
- Min.: DBL_MIN
- Max.: DBL_MAX
- Access rights: read: X X write: X X X X

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### $AN_IPO_LOAD_PERCENT$

**Description:**
$AN_IPO_LOAD_PERCENT$ supplies the current interpolator load percentage across all channels. It is calculated from the ratio of the interpolator runtime across all channels in the last interpolation cycle to the interpolation cycle.

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>NCK Version</th>
<th>Unit</th>
<th>Min.:</th>
<th>Max.:</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>54.00.00</td>
<td>DBL_MIN</td>
<td>DBL_MAX</td>
<td></td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attributes</td>
<td>global</td>
<td>block</td>
<td>search</td>
<td>link</td>
</tr>
</tbody>
</table>

### $AN_SYNC_ACT_LOAD$

**Description:**
$AN_SYNC_ACT_LOAD$ supplies the current runtime for synchronized actions of the last interpolation cycle across all channels.

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>NCK Version</th>
<th>Unit</th>
<th>Min.:</th>
<th>Max.:</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>54.00.00</td>
<td>DBL_MIN</td>
<td>DBL_MAX</td>
<td></td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attributes</td>
<td>global</td>
<td>block</td>
<td>search</td>
<td>link</td>
</tr>
</tbody>
</table>

### $AN_SYNC_MAX_LOAD$

**Description:**
$AN_SYNC_MAX_LOAD$ supplies the longest runtime for synchronized actions of one interpolation cycle across all channels.

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>NCK Version</th>
<th>Unit</th>
<th>Min.:</th>
<th>Max.:</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>54.00.00</td>
<td>DBL_MIN</td>
<td>DBL_MAX</td>
<td></td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>7</td>
</tr>
<tr>
<td>Attributes</td>
<td>global</td>
<td>block</td>
<td>search</td>
<td>link</td>
</tr>
</tbody>
</table>

---

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SINUMERIK 840D sl/840Di sl/ 840D/ 840Di, List of System Variables (PGA1), 01/2008
### $\textit{SAN\_SYNC\_TO\_IPO}$

**Description:**

$\textit{SAN\_SYNC\_TO\_IPO}$ supplies the percentage proportion of the synchronized action runtime measured against the overall interpolation runtime of the last interpolation cycle across all channels.

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>NCK Version: 54.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit</td>
<td>- DBL_MIN DBL_MAX</td>
</tr>
<tr>
<td>Run-in</td>
<td>main run runin stp Mrun syn</td>
</tr>
<tr>
<td>Read</td>
<td>X X X X</td>
</tr>
<tr>
<td>Write</td>
<td>X X X X</td>
</tr>
<tr>
<td>Attributes</td>
<td>global block search link</td>
</tr>
<tr>
<td>Access Rights</td>
<td>Not classified Not classified</td>
</tr>
</tbody>
</table>

### $\textit{SAN\_SERVO\_ACT\_LOAD}$

**Description:**

$\textit{SAN\_SERVO\_ACT\_LOAD}$ supplies the current runtime of the position controller.

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>NCK Version: 54.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit</td>
<td>- DBL_MIN DBL_MAX</td>
</tr>
<tr>
<td>Run-in</td>
<td>main run runin stp Mrun syn</td>
</tr>
<tr>
<td>Read</td>
<td>X X X X</td>
</tr>
<tr>
<td>Write</td>
<td>X X X X</td>
</tr>
<tr>
<td>Attributes</td>
<td>global block search link</td>
</tr>
<tr>
<td>Access Rights</td>
<td>Not classified Not classified</td>
</tr>
</tbody>
</table>

### $\textit{SAN\_SERVO\_MAX\_LOAD}$

**Description:**

$\textit{SAN\_SERVO\_MAX\_LOAD}$ supplies the longest runtime of the position controller.

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>NCK Version: 54.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit</td>
<td>- DBL_MIN DBL_MAX</td>
</tr>
<tr>
<td>Run-in</td>
<td>main run runin stp Mrun syn</td>
</tr>
<tr>
<td>Read</td>
<td>X X X X X</td>
</tr>
<tr>
<td>Write</td>
<td>X X X X X</td>
</tr>
<tr>
<td>Attributes</td>
<td>global block search link</td>
</tr>
<tr>
<td>Access Rights</td>
<td>Not classified Not classified</td>
</tr>
</tbody>
</table>
### $AN_SERVO_MIN_LOAD

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>$AN_SERVO_MIN_LOAD suppies the shortest runtime of the position controller.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>Min.</th>
<th>Max.</th>
<th>NCK Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td></td>
<td></td>
<td>54.00.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit</th>
<th>Run-in</th>
<th>Main</th>
<th>Runin Stp</th>
<th>Mrun Syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>DBL_MIN</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>run-in</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Read Rights</th>
<th>Write Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>XX</td>
<td>XXXX</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Attributes</th>
<th>Global</th>
<th>Block Search</th>
<th>Link</th>
<th>No restrictions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not classified</td>
<td>Not classified</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### $AN_REBOOT_DELAY_TIME

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>$AN_REBOOT_DELAY_TIME is 0.0 provided that no &quot;NCK Reset&quot; has been received.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>Min.</th>
<th>Max.</th>
<th>NCK Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>0.0</td>
<td>DBL_MAX</td>
<td>56.00.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit</th>
<th>Run-in</th>
<th>Main</th>
<th>Runin Stp</th>
<th>Mrun Syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>s</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Read Rights</th>
<th>Write Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>XXX</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Attributes</th>
<th>Global</th>
<th>Block Search</th>
<th>Link</th>
<th>No restrictions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>X</td>
<td>Independent</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

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SINUMERIK 840D sl/840Di sl/ 840D/ 840Di, List of System Variables (PGA1), 01/2008
### $\text{DOUBLE} \ \$\text{AN}\_\text{TIMER}[n]$

**description:**

$\text{AN}\_\text{TIMER}[n]$  
Timer unit in seconds  
The time is counted in multiples of an interpolation cycle.  
The timers are started by $\text{AN}\_\text{TIMER}[n]=<\text{start value}>$.  
The timers are stopped by $\text{AN}\_\text{TIMER}[n]=-1$.  
When a timer is stopped, the last current time value is stored.

**description of field limits:**

The dimension is defined in MD $\text{MN}\_\text{MM}\_\text{NUM}\_\text{AN}\_\text{TIMER}$.

<table>
<thead>
<tr>
<th>NCK version: 56.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit: -</td>
</tr>
<tr>
<td>run-in</td>
</tr>
<tr>
<td>read:</td>
</tr>
<tr>
<td>write:</td>
</tr>
</tbody>
</table>

**attributes:** global  
block  
search  
link  
X  
Not classified  
Not classified

### $\text{INT} \ \$\text{A}\_\text{PROBE}[2]$

**description:**

$\text{A}\_\text{PROBE}[1]$: Status of first probe  
$\text{A}\_\text{PROBE}[2]$: Status of second probe  
0 => not deflected  
1 => deflected  

**description of field limits:**

n: Number of probe

<table>
<thead>
<tr>
<th>NCK version: 13.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit: -</td>
</tr>
<tr>
<td>run-in</td>
</tr>
<tr>
<td>read:</td>
</tr>
<tr>
<td>write:</td>
</tr>
</tbody>
</table>

**attributes:** global  
block  
search  
link  
Not classified  
Not classified
### $\$AN_PERSDIAG[4,6]$

**Description:**
Diagnostics data for data persistence (frequency, time required); e.g. CompactFlash card

The values indicate how long it took from the viewpoint of the NC software to achieve data persistence. The following values can be read:

<table>
<thead>
<tr>
<th>Index1</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Always sums on all sub-functions</td>
</tr>
<tr>
<td>1</td>
<td>Sub-function 'Passive file system'</td>
</tr>
<tr>
<td>2</td>
<td>Sub-function 'Active file system'</td>
</tr>
<tr>
<td>3</td>
<td>Sub-function 'Machine data'</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Index2</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Number of all persistence operations</td>
</tr>
<tr>
<td>1</td>
<td>Number of failed persistence operations (system deficiency)</td>
</tr>
<tr>
<td>2</td>
<td>Summed up time of all persistence operations in seconds</td>
</tr>
<tr>
<td>3</td>
<td>Minimum time required for a persistence operation in seconds</td>
</tr>
<tr>
<td>4</td>
<td>Average time (averaged across all persistence operations) in seconds</td>
</tr>
<tr>
<td>5</td>
<td>Maximum time required for a persistence operation in seconds</td>
</tr>
</tbody>
</table>

**Application in NC program:**

```plaintext
IF $\$AN_PERSDIAG[0, 1] > 0 GOTOF check card
```

**Description of field limits:**

- to be defined
- to be defined

<table>
<thead>
<tr>
<th>Axis identifier</th>
<th>NCK version: 62.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit</td>
<td>s</td>
</tr>
<tr>
<td>run-in</td>
<td>min.: DBL_MIN</td>
</tr>
<tr>
<td>main run</td>
<td>max.: DBL_MAX</td>
</tr>
<tr>
<td>runin stp</td>
<td>Mrun syn</td>
</tr>
<tr>
<td>PP</td>
<td>SA</td>
</tr>
<tr>
<td>OPI</td>
<td>OEM</td>
</tr>
<tr>
<td>access rights</td>
<td></td>
</tr>
<tr>
<td>read</td>
<td>X X</td>
</tr>
<tr>
<td>write</td>
<td>X X X X X X</td>
</tr>
</tbody>
</table>

**Attributes:**

- global
- block search
- link

**Current value:**
No restrictions

---

### $\$AN_VMODEL_STATUS$

**Description:**
TO DO!

<table>
<thead>
<tr>
<th>Axis identifier</th>
<th>NCK version: 62.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit</td>
<td>-</td>
</tr>
<tr>
<td>run-in</td>
<td>min.: INT_MIN</td>
</tr>
<tr>
<td>main run</td>
<td>max.: INT_MAX</td>
</tr>
<tr>
<td>runin stp</td>
<td>Mrun syn</td>
</tr>
<tr>
<td>PP</td>
<td>SA</td>
</tr>
<tr>
<td>OPI</td>
<td>OEM</td>
</tr>
<tr>
<td>access rights</td>
<td></td>
</tr>
<tr>
<td>read</td>
<td>X X X</td>
</tr>
<tr>
<td>write</td>
<td>X X X X X X</td>
</tr>
</tbody>
</table>

**Attributes:**

- global
- block search
- link

**Current value:**
Not classified
### $A\_DPSB\_IN[MD\_MAXNUM\_DPIO\_RANGE\_IN,MD\_MAXNUM\_DPIO\_BYTES\_RANGE\_IN]$

**Description:**
The field variable $A\_DPSB\_IN[n,m]$ is used to read a data byte (8 bits) from PROFIBUS/PROFINET IO.

- **n**: Index for the input data area
- **m**: Byte Index for the data

The value is shown as signed. The data area to be read can become invalid during power up or even during operation as connected devices may not yet have been detected or are already no longer connected to the PROFIBUS/PROFINET. In this case, the old value or initial value 0 is always read. Whether a data area is valid can be queried with the variables $A\_DP\_IN\_STATE[n]$ or $A\_DP\_IN\_VALID$.

**Description of field limits:**
to be defined

**Axis identifier:**
NCK version: 65.00.00

<table>
<thead>
<tr>
<th>Unit</th>
<th>Min.</th>
<th>Max.</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>-128</td>
<td>127</td>
<td>read: XXX XXXX</td>
</tr>
<tr>
<td>main run</td>
<td>run in stp</td>
<td>Mrun syn</td>
<td>write: X X X X X</td>
</tr>
<tr>
<td>PP</td>
<td>SA</td>
<td>OPI</td>
<td>OEM</td>
</tr>
</tbody>
</table>

**Attributes:**
global block search link

t Not classified

### $A\_DPB\_IN[MD\_MAXNUM\_DPIO\_RANGE\_IN,MD\_MAXNUM\_DPIO\_BYTES\_RANGE\_IN]$

**Description:**
The field variable $A\_DPB\_IN[n,m]$ is used to read a data byte (8 bits) from PROFIBUS/PROFINET IO.

- **n**: Index for the input data area
- **m**: Byte Index for the data

The value is shown as unsigned. The data area to be read can become invalid during power up or even during operation as connected devices may not yet have been detected or are already no longer connected to the PROFIBUS/PROFINET. In this case, the old value or initial value 0 is always read. Whether a data area is valid can be queried with the variables $A\_DP\_IN\_STATE[n]$ or $A\_DP\_IN\_VALID$.

**Description of field limits:**
to be defined

**Axis identifier:**
NCK version: 65.00.00

<table>
<thead>
<tr>
<th>Unit</th>
<th>Min.</th>
<th>Max.</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>0</td>
<td>255</td>
<td>read: XXX XXXX</td>
</tr>
<tr>
<td>main run</td>
<td>run in stp</td>
<td>Mrun syn</td>
<td>write: X X X X X</td>
</tr>
<tr>
<td>PP</td>
<td>SA</td>
<td>OPI</td>
<td>OEM</td>
</tr>
</tbody>
</table>

**Attributes:**
global block search link

t Not classified
1.24 System data

The variable $A_{DP\_IN\_VALID}$ is used to read all valid input data areas of the PROFIBUS/PROFINET IO. The value is coded as a bit array. The assignment of the bits corresponds to the indices of the input data areas. The input data area is invalid if the input data area could not be logged on during power on or the communications with the PROFIBUS/PROFINET has been interrupted during normal operation. The status of an input data area can be queried with the variable $A_{DP\_IN\_STATE}[n]$.

**Description of field limits:**

to be defined

---

The variable $A_{DP\_IN\_STATE}[n]$ is used to read the status of the input data area. 

n:= Index for the input data area

The following states can be read:

0: Data area has not been configured
1: Data area could not be activated yet
2: Data area is available
3: Data area is currently not available

Whether an input data area is available can be queried with the variable $A_{DP\_IN\_VALID}$.

---

**Axis identifier:**

NCK version: 65.00.00

**Unit:**

<table>
<thead>
<tr>
<th>run-in</th>
<th>main run</th>
<th>run-in slp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>main run</td>
<td>run-in slp</td>
<td>Mrun syn</td>
<td>PP</td>
<td>SA</td>
<td>OPT</td>
<td>OEM</td>
<td>access rights</td>
</tr>
</tbody>
</table>

**Read:**

| X | X | X | X | X | X | X | X |

**Write:**

| X | Not classified | Not classified |

---

**Axis identifier:**

NCK version: 65.00.00

**Unit:**

<table>
<thead>
<tr>
<th>run-in</th>
<th>main run</th>
<th>run-in slp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>main run</td>
<td>run-in slp</td>
<td>Mrun syn</td>
<td>PP</td>
<td>SA</td>
<td>OPT</td>
<td>OEM</td>
<td>access rights</td>
</tr>
</tbody>
</table>

**Read:**

| X | X | X | X | X | X | X | X |

**Write:**

| X | Not classified | Not classified |
### $A_DP_OUT_STATE[MD_MAXNUM_DPIO_RANGE_OUT]

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>The variable $A_DP_OUT_STATE[n]$ is used to read the status of the output data area.</td>
</tr>
<tr>
<td>$n$: Index for the output data area</td>
</tr>
<tr>
<td>The following states can be read:</td>
</tr>
<tr>
<td>0: Data area has not been configured</td>
</tr>
<tr>
<td>1: Data area could not be activated yet</td>
</tr>
<tr>
<td>2: Data area is available</td>
</tr>
<tr>
<td>3: Data area is currently not available</td>
</tr>
<tr>
<td>Whether a data area is available can be queried with the variable $A_DP_OUT_VALID$.</td>
</tr>
</tbody>
</table>

#### Field Limits:
- **Axis Identifier:** NCK version: 65.00.00
- **Unit:** - min.: 0 max.: 3
- **Run-In/Main Run/Runin/Stop/Mrun/Syn:** PP SA OPI OEM
- **Access Rights:** read: XXX XXXX write: X X X X X
- **Attributes:** global block search link Not classified

### $A_DP_OUT_VALID

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>The variable $A_DP_OUT_VALID_IN$ is used to read all valid output data areas of the PROFIBUS/PROFINET IO.</td>
</tr>
<tr>
<td>The value is coded as a bit array. The assignment of the bits corresponds to the indices of the output data areas. The output data area is invalid if the output data area could not be logged on during power up or the communications with the PROFIBUS/PROFINET has been interrupted during normal operation. The status of an output data area can be queried with the variable $A_DP_OUT_STATE[n]$.</td>
</tr>
</tbody>
</table>

#### Field Limits:
- **Axis Identifier:** NCK version: 65.00.00
- **Unit:** INT_MIN min.: INT_MAX max.: 3
- **Run-In/Main Run/Runin/Stop/Mrun/Syn:** PP SA OPI OEM
- **Access Rights:** read: XXX XXXX write: X X X X X
- **Attributes:** global block search link Not classified
### $A\_DP\_IN\_CONF$

**Description:**
The variable $A\_DP\_IN\_CONF$ is used to read all configured input data areas of the PROFIBUS/PROFINET IO. The value is coded as a bit field. The assignment of the bits corresponds to the indices of the input data areas. A configured input data area is present if a logical starting address has been entered in the input data area via machine data $MN\_DPIO\_LOGIC\_ADDRESS\_IN$. The status of an input data area can be queried with the variable $A\_DP\_IN\_STATE[n]$.

**Axis Identifier:**
- **NCK version:** 65.00.00

<table>
<thead>
<tr>
<th>run-in</th>
<th>main run</th>
<th>runin slip</th>
<th>Mrun sync</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

**Attributes:**
- Global
- Block search
- Link

**X Not classified**

### $A\_DP\_OUT\_CONF$

**Description:**
The variable $A\_DP\_OUT\_CONF$ is used to read all configured output data areas of the PROFIBUS/PROFINET IO. The value is coded as a bit field. The assignment of the bits corresponds to the indices of the output data areas. A configured data area is present if a logical starting address has been entered in an output data area via machine data $MN\_DPIO\_LOGIC\_ADDRESS\_OUT$. The status of an output data area can be queried with the variable $A\_DP\_OUT\_STATE[n]$.

**Axis Identifier:**
- **NCK version:** 65.00.00

<table>
<thead>
<tr>
<th>run-in</th>
<th>main run</th>
<th>runin slip</th>
<th>Mrun sync</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
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<td>X</td>
<td>X</td>
<td>X</td>
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<td>X</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

**Attributes:**
- Global
- Block search
- Link

**X Not classified**

### $A\_DP\_IN\_LENGTH[MD\_MAXNUM\_DPIO\_RANGE\_IN]$

**Description:**
The variable $A\_DP\_IN\_LENGTH[n]$ is used to read the length of the input data area. $n$: Index for the input data area

Whether an input data area is available can be queried with the variables $A\_DP\_IN\_VALID$ and $A\_DP\_IN\_STATE[n]$.

**Description of Field Limits:**
- To be defined

**Axis Identifier:**
- **NCK version:** 65.00.00

<table>
<thead>
<tr>
<th>run-in</th>
<th>main run</th>
<th>runin slip</th>
<th>Mrun sync</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
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<td>X</td>
<td></td>
</tr>
</tbody>
</table>

**Attributes:**
- Global
- Block search
- Link

**X Not classified**

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SINUMERIK 840D s/l/840Di s/l/ 840D/ 840Di, List of System Variables (PGA1), 01/2008
1 System variable
1.24 System data

INT

$A\_DP\_OUT\_LENGTH[MD\_MAXNUM\_M\_DPIO\_RANGE\_OUT]$ description:

The variable $A\_DP\_OUT\_LENGTH[n]$ is used to read the length of the output data area.

n:= Index for the output data area

Whether an output data area is available can be queried with the variables $A\_DP\_OUT\_VALID$ and $A\_DP\_OUT\_STATE[n]$.

description of field limits:
to be defined

axis identifier: NCK version: 65.00.00
unit: INT_MAX
run-in main run runin syn PP SA OPT OEM access rights
read: X X X X X X
write: X Not classified Not classified
attributes: global block search link

INT

$A\_DPW\_IN[MD\_MAXNUM\_DPIO\_RANGE\_IN, MD\_MAXNUM\_DPIO\_BYTES\_RANGE\_IN]$ description:

The field variable $A\_DPW\_IN[n,m]$ is used to read a data word (16 bits) from PROFIBUS/PROFINET IO.

n:= Index for the input data area

m:= Byte index for the data

The value is shown as unsigned.

The data area to be read can become invalid during power up or even during operation as connected devices may not yet have been detected or are already no longer connected to the PROFIBUS/PROFINET.

In this case, the old value or initial value 0 is always read.

Whether a data area is valid can be queried with the variables $A\_DP\_IN\_STATE[n]$ or $A\_DP\_IN\_VALID$.

description of field limits:
to be defined
to be defined

axis identifier: NCK version: 65.00.00
unit: 65535
run-in main run runin syn PP SA OPT OEM access rights
read: X X X X X X
write: X Not classified Not classified
attributes: global block search link

X Not classified Not classified
### 1.24 System data

#### DOUBLE

**$A\_DPR\_OUT[MD\_MAXNUM\_DPIO\_RANGE\_OUT,MD\_MAXNUM\_DPIO\_BYTES\_RANGE\_OUT]$**

**description:**

The field variable $A\_DPR\_OUT[n,m]$ is used to write output data (32 bits REAL) to PROFINET IO.

- $n$: Index for the output data area
- $m$: Byte Index for the data

The value is compressed to 4 bytes IEEE (real).

The data area to be written can become invalid during power up or even during operation as connected devices may not yet have been detected or are already no longer connected to the PROFINET. In this case the transfer of the value cannot be guaranteed.

Whether a data area is valid can be queried with the variables $A\_DP\_OUT\_STATE[n]$ or $A\_DP\_OUT\_VALID$.

**description of field limits:**

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>NCK version: 65.00.00</th>
</tr>
</thead>
<tbody>
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<td>run-in</td>
<td>main run</td>
</tr>
<tr>
<td>read:</td>
<td>X X X</td>
</tr>
<tr>
<td>write:</td>
<td>X X X</td>
</tr>
<tr>
<td>attributes:</td>
<td>global block search</td>
</tr>
</tbody>
</table>

#### INT

**$A\_DPB\_OUT[MD\_MAXNUM\_DPIO\_RANGE\_OUT,MD\_MAXNUM\_DPIO\_BYTES\_RANGE\_OUT]$**

**description:**

The field variable $A\_DPB\_OUT[n,m]$ is used to write a data byte (8 bits) to PROFINET IO.

- $n$: Index for the output data area
- $m$: Byte Index for the data

The value is shown as unsigned.

The data area to be written can become invalid during power up or even during operation as connected devices may not yet have been detected or are already no longer connected to the PROFINET. In this case the transfer of the value cannot be guaranteed.

Whether a data area is valid can be queried with the variables $A\_DP\_OUT\_STATE[n]$ or $A\_DP\_OUT\_VALID$.

**description of field limits:**

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
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<td>run-in</td>
<td>main run</td>
</tr>
<tr>
<td>read:</td>
<td>X X X</td>
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<tr>
<td>write:</td>
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<tr>
<td>attributes:</td>
<td>global block search</td>
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</tbody>
</table>

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SINUMERIK 840D sl/840Di sl/ 840D/ 840Di, List of System Variables (PGA1), 01/2008
### System Variable Data

**$A_DPW_OUT[MD_MAXNUM_DPIO\_RANGE_OUT,MD_MAXNUM_DPIO\_BYTES_RANGE_OUT]$**

**Description:**

The field variable $A_DPW_OUT[n,m]$ is used to write a data word (16 bits) to PROFIBUS/PROFINET IO.

- **n:** Index for the output data area
- **m:** Byte Index for the data

The value is shown as unsigned.

The data area to be written can become invalid during power up or even during operation as connected devices may not yet have been detected or are already no longer connected to the PROFIBUS/PROFINET. In this case, the transfer of the value cannot be guaranteed.

Whether a data area is valid can be queried with the variables $A_DP_OUT_STATE[n]$ or $A_DP_OUT_VALID$.

**Description of Field Limits:**

- To be defined

**Axis Identifier:**

- **NCK version:** 65.00.00
- **Unit:** -
- **Min.:** 0
- **Max.:** 65535

**Run-In:** main run runin stop Mrun syn PP SA OPI OEM access rights

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
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<tr>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

**Attributes:**

- Global
- Block
- Search
- Link
- Not classified

**DOUBLE $A_DPR_IN[MD_MAXNUM_DPIO\_RANGE_IN,MD_MAXNUM_DPIO\_BYTES_RANGE_IN]$**

**Description:**

The field variable $A_DPR_IN[n,m]$ is used to read input data (32 bits REAL) from PROFIBUS/PROFINET IO.

- **n:** Index for the input data area
- **m:** Byte Index for the data

The value is expanded to 8 bytes IEEE (double).

The data area to be read can become invalid during power up or even during operation as connected devices may not yet have been detected or are already no longer connected to the PROFIBUS/PROFINET. In this case, the old value or initial value 0.0 is always read.

Whether a data area is valid can be queried with the variables $A_DP_IN_STATE[n]$ or $A_DP_IN_VALID$.

**Description of Field Limits:**

- To be defined

**Axis Identifier:**

- **NCK version:** 65.00.00
- **Unit:** -
- **Min.:** DBL_MIN
- **Max.:** DBL_MAX

**Run-In:** main run runin stop Mrun syn PP SA OPI OEM access rights

<table>
<thead>
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</tbody>
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**Attributes:**

- Global
- Block
- Search
- Link
- Not classified

---

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SINUMERIK 840D sl/840Di sl/ 840D/ 840Di, List of System Variables (PGA1), 01/2008
### INT $A_DPSW_IN[MD_MAXNUM_DPIO_RANGE_IN,MD_MAXNUM_DPIO_BYTES_RANGE_IN]$

**description:**
The field variable $A_DPSW_IN[n,m]$ is used to read a data word (16 bits) from PROFIBUS/PROFINET IO.

- $n$:= Index for the input data area
- $m$:= Byte Index for the data

The value shown is signed.

The data area to be read can become invalid during power up or even during operation as connected devices may not yet have been detected or are already no longer connected to the PROFIBUS/PROFINET. In this case, the old value or initial value 0 is always read.

Whether a data area is valid can be queried with the variables $A_DP_IN_STATE[n]$ or $A_DP_IN_VALID$.

**description of field limits:**
to be defined

to be defined

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<td>max.:</td>
<td>32767</td>
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<td>run-in</td>
<td>main run</td>
<td>runin stp</td>
</tr>
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<td>read</td>
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<td>X</td>
<td>X</td>
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<tr>
<td>write</td>
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<td></td>
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<tr>
<td>attributes:</td>
<td>global</td>
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<tr>
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<td>Not classified</td>
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### INT $A_DPSD_IN[MD_MAXNUM_DPIO_RANGE_IN,MD_MAXNUM_DPIO_BYTES_RANGE_IN]$

**description:**
The field variable $A_DPSD_IN[n,m]$ is used to read a data double word (32 bits) from PROFIBUS/PROFINET IO.

- $n$:= Index for the input data area
- $m$:= Byte Index for the data

The value shown is signed.

The data area to be read can become invalid during power up or even during operation as connected devices may not yet have been detected or are already no longer connected to the PROFIBUS/PROFINET. In this case, the old value or initial value 0 is always read.

Whether a data area is valid can be queried with the variables $A_DP_IN_STATE[n]$ or $A_DP_IN_VALID$.

**description of field limits:**
to be defined

to be defined

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<td>max.:</td>
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<td>run-in</td>
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<td>runin stp</td>
</tr>
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<td>read</td>
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<td>X</td>
<td>X</td>
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<tr>
<td>write</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
<td>link</td>
</tr>
<tr>
<td></td>
<td>X</td>
<td>Not classified</td>
<td>Not classified</td>
</tr>
</tbody>
</table>
### $A_DPSB_OUT[MD_MAXNUM_DI, O_RANGE_OUT, MD_MAXNUM_DPI, O_BYTES_RANGE_OUT]

**Description:**
The field variable $A_DPSB_IN[n,m]$ is used to write a data byte (8 bits) to PROFIBUS/PROFINET IO.

- **n:** Index for the output data area
- **m:** Byte Index for the data

The value is shown as signed.

The data area to be written can become invalid during power up or even during operation as connected devices may not yet have been detected or are already no longer connected to the PROFIBUS/PROFINET. In this case the transfer of the value cannot be guaranteed.

Whether a data area is valid can be queried with the variables $A_DP_OUT_STATE[n]$ or $A_DP_OUT_VALID$.

**Description of Field Limits:**
to be defined

to be defined

**Axis Identifier:**
- NCK version: 65.00.00

**Unit:**
- run-in: main run runin syn PP SA OPI OEM access rights
- read: X X X X
- write: X X X X

**Attributes:**
- global: block search link
- X Not classified Not classified

---

### $A_DPSW_OUT[MD_MAXNUM_DPI, O_RANGE_OUT, MD_MAXNUM_DPI, O_BYTES_RANGE_OUT]

**Description:**
The field variable $A_DPSW_IN[n,m]$ is used to write a data word (16 bits) to PROFIBUS/PROFINET IO.

- **n:** Index for the output data area
- **m:** Byte Index for the data

The value is shown as signed.

The data area to be written can become invalid during power up or even during operation as connected devices may not yet have been detected or are already no longer connected to the PROFIBUS/PROFINET. In this case the transfer of the value cannot be guaranteed.

Whether a data area is valid can be queried with the variables $A_DP_OUT_STATE[n]$ or $A_DP_OUT_VALID$.

**Description of Field Limits:**
to be defined

to be defined

**Axis Identifier:**
- NCK version: 65.00.00

**Unit:**
- run-in: main run runin syn PP SA OPI OEM access rights
- read: X X X X
- write: X X X X

**Attributes:**
- global: block search link
- X Not classified Not classified
### $\$A_DPSD\_OUT[MD\_MAXNUM\_DPI\_O\_RANGE\_OUT,MD\_MAXNUM\_DPI\_O\_BYTES\_RANGE\_OUT]$ 

**Description:**
The field variable $\$A_DPSD\_OUT[n,m]$ is used to write a data double word (32 bits) to PROFIBUS/PROFINET IO. 

- **n:** Index for the output data area
- **m:** Byte Index for the data

The value is shown as signed.

The data area to be written can become invalid during power up or even during operation as connected devices may not yet have been detected or are already no longer connected to the PROFIBUS/PROFINET. In this case the transfer of the value cannot be guaranteed.

Whether a data area is valid can be queried with the variables $\$A\_DP\_OUT\_STATE[n]$ or $\$A\_DP\_OUT\_VALID$.

**Description of field limits:**
to be defined

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<table>
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<th>Main Run</th>
<th>Runin Stop</th>
<th>Mrun Syn</th>
<th>PP</th>
<th>SA</th>
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<th>OEM</th>
<th>Access Rights</th>
</tr>
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<tr>
<td>Main Run</td>
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<tr>
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- **Read:** XXX XXXX
- **Write:** XXX XX X7

- **Attributes:**
  - Global
  - Block Search
  - Link

  - Not classified

### $\$AN\_COLL\_MEM\_AVAILABLE$ 

**Description:**
Collision calculation requires internal memory. The amount required is either calculated automatically from the number of available protection areas, protection area elements, facets and the number of machine axes, or it can be explicitly defined by machine data $\$MN\_MM\_MAXNUM\_3D\_COLLISION$.

The size of the reserved memory area can be read in kbytes with the system variable $\$AN\_COLL\_MEM\_AVAILABLE$.

**Description of field limits:**
to be defined

<table>
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<th>NCK Version</th>
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<th>Mrun Syn</th>
<th>PP</th>
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<th>OEM</th>
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<td>Runin Stop</td>
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<tr>
<td>Mrun Syn</td>
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</tbody>
</table>

- **Read:** XX XXXX
- **Write:**

- **Attributes:**
  - Global
  - Block Search
  - Link

  - Not classified

  - No restrictions
DOUBLE $AN_COLL_MEM_USE_MIN
description:
Collision calculation requires internal memory. The amount required is either calculated automatically from
the number of available protection areas, protection area elements, facets and the number of machine
axes, or it can be explicitly defined by machine data $MN_MM_MAXNUM_3D_COLLISION.
The size of the reserved memory area can be read in kbytes with the system variable
$AN_COLL_MEM_AVAILABLE.
The system variable $AN_COLL_MEM_USE_MIN returns the minimum memory space required for
collision calculation as a percentage of the reserved memory area.
It can be reset by writing it to the value 0. Each attempt to write a value other than 0 is rejected with an error
message.

<table>
<thead>
<tr>
<th>axis identifier: NCK version:</th>
<th>unit:</th>
<th>min.:</th>
<th>max.:</th>
</tr>
</thead>
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<td>runin stp</td>
<td>Mrun syn</td>
</tr>
<tr>
<td>read: X</td>
<td>X</td>
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<td>X</td>
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<td>attributes: global block search not classified No restrictions</td>
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</table>

DOUBLE $AN_COLL_MEM_USE_MAX
description:
Collision calculation requires internal memory. The amount required is either calculated automatically from
the number of available protection areas, protection area elements, facets and the number of machine
axes, or it can be explicitly defined by machine data $MN_MM_MAXNUM_3D_COLLISION.
The size of the reserved memory area can be read in kbytes with the system variable
$AN_COLL_MEM_AVAILABLE.
The system variable $AN_COLL_MEM_USE_MAX returns the minimum memory space required for
collision calculation as a percentage of the reserved memory area.
It can be reset by writing it to the value 0. Each attempt to write a value other than 0 is rejected with an error
message.

<table>
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<tr>
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<td>runin stp</td>
<td>Mrun syn</td>
</tr>
<tr>
<td>read: X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>write: X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>attributes: global block search not classified No restrictions</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Collision calculation requires internal memory. The amount required is either calculated automatically from the number of available protection areas, protection area elements, facets and the number of machine axes, or it can be explicitly defined by machine data $MN_MM_MAXNUM_3D_COLLISION.

The size of the reserved memory area can be read in kbytes with the system variable $AN_COLL_MEM_AVAILABLE.

The system variable $AN_COLL_MEM_USE_ACT returns the memory space currently required for collision calculation (that is for the last calculation) as a percentage of the reserved memory area.

It can be reset by writing it to the value 0. Each attempt to write a value other than 0 is rejected with an error message.

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>NCK version:</th>
<th>71.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit:</td>
<td>min.:</td>
<td>0</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin sip</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
</tr>
</tbody>
</table>
## 1.25 Axial system variables

<table>
<thead>
<tr>
<th>DOUBLE</th>
<th>$P_EP[31]$</th>
<th>description:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
|        |              | System variable $P\_EP$ supplies the current WCS setpoint position in the interpreter. The numerical value is not necessarily identical to the value programmed in the part program. The two values differ in the following situations:
|        |              | - with incremental programming
|        |              | - when the WCS is changed by a frame or tool selection
|        |              | If an ASUB is started after a block search with calculation, the positions in the interpreter are synchronized with this operation. $P\_EP$ then supplies the actual standstill positions of the axes in the Asub. The collected search position can be interrogated via system variable $AC\_RETPOINT$. |

**description of field limits:**
- to be defined

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>MACHAX</th>
<th>SPINDLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit:</td>
<td>Linear / angular position</td>
<td>min.:</td>
<td>max.:</td>
<td></td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin stp</td>
<td>Mrun syn</td>
<td>PP</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
<td>link</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DOUBLE</th>
<th>$P_EPM[31]$</th>
<th>description:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Axial variable $P_EPM[ax]$ determines the current programmed MCS target position in the preprocessor for the specified axis (see also $P_EP$).</td>
</tr>
</tbody>
</table>

**description of field limits:**
- to be defined

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>MACHAX</th>
<th>SPINDLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit:</td>
<td>Linear / angular position</td>
<td>min.:</td>
<td>max.:</td>
<td></td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin stp</td>
<td>Mrun syn</td>
<td>PP</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
<td>link</td>
<td></td>
</tr>
</tbody>
</table>
### $P\_APR[31]$

<table>
<thead>
<tr>
<th>Description:</th>
<th>Position of axis in workpiece coordinate system at starting point of approach movement on smooth approach to the contour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field limits:</td>
<td>to be defined</td>
</tr>
<tr>
<td>Identifier:</td>
<td>GEOAX, CHANAX, MACHAX, SPINDLE</td>
</tr>
<tr>
<td>Unit:</td>
<td>Linear / angular position</td>
</tr>
<tr>
<td>Min.:</td>
<td>DBL_MIN</td>
</tr>
<tr>
<td>Max.:</td>
<td>DBL_MAX</td>
</tr>
<tr>
<td>Read:</td>
<td>X</td>
</tr>
<tr>
<td>Write:</td>
<td>X</td>
</tr>
<tr>
<td>Attributes:</td>
<td>Global, Block search, Link</td>
</tr>
</tbody>
</table>

### $P\_AEP[31]$

<table>
<thead>
<tr>
<th>Description:</th>
<th>Approach point: First contour point in workpiece coordinate system on smooth approach to contour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field limits:</td>
<td>to be defined</td>
</tr>
<tr>
<td>Identifier:</td>
<td>GEOAX, CHANAX, MACHAX, SPINDLE</td>
</tr>
<tr>
<td>Unit:</td>
<td>Linear / angular position</td>
</tr>
<tr>
<td>Min.:</td>
<td>DBL_MIN</td>
</tr>
<tr>
<td>Max.:</td>
<td>DBL_MAX</td>
</tr>
<tr>
<td>Read:</td>
<td>X</td>
</tr>
<tr>
<td>Write:</td>
<td>X</td>
</tr>
<tr>
<td>Attributes:</td>
<td>Global, Block search, Link, Not classified</td>
</tr>
</tbody>
</table>
### $P_{POLF}[X]$

**DOUBLE**

<table>
<thead>
<tr>
<th>Description</th>
<th>$P_{POLF}[X]$</th>
<th>Supplies the programmed retraction position of the axis X: Axis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description of field limits:</td>
<td></td>
<td>To be defined</td>
</tr>
<tr>
<td>Axis identifier:</td>
<td>GEOAX, CHANAX, MACHAX, SPINDLE</td>
<td></td>
</tr>
<tr>
<td>NCK version:</td>
<td>51.00.00</td>
<td></td>
</tr>
<tr>
<td>Unit:</td>
<td>Linear/angular position</td>
<td></td>
</tr>
<tr>
<td>Min.:</td>
<td>DBL_MIN</td>
<td></td>
</tr>
<tr>
<td>Max.:</td>
<td>DBL_MAX</td>
<td></td>
</tr>
<tr>
<td>Run-in</td>
<td>main run</td>
<td>runin slp</td>
</tr>
<tr>
<td>Read:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Write:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attributes:</td>
<td>global</td>
<td>block search</td>
</tr>
</tbody>
</table>

### $P_{POLF\_VALID}[X]$

**INT**

<table>
<thead>
<tr>
<th>Description</th>
<th>$P_{POLF_VALID}[X]$</th>
<th>Supplies the status of $P_{POLF}[X]$ X: Axis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Return values:</td>
<td></td>
<td>0: No retraction programmed 1: Retraction programmed as distance</td>
</tr>
<tr>
<td>Description of field limits:</td>
<td></td>
<td>To be defined</td>
</tr>
<tr>
<td>Axis identifier:</td>
<td>GEOAX, CHANAX, MACHAX, SPINDLE</td>
<td></td>
</tr>
<tr>
<td>NCK version:</td>
<td>51.00.00</td>
<td></td>
</tr>
<tr>
<td>Unit:</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Min.:</td>
<td>FALSE</td>
<td></td>
</tr>
<tr>
<td>Max.:</td>
<td>TRUE</td>
<td></td>
</tr>
<tr>
<td>Run-in</td>
<td>main run</td>
<td>runin slp</td>
</tr>
<tr>
<td>Read:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Write:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attributes:</td>
<td>global</td>
<td>block search</td>
</tr>
</tbody>
</table>
### 1.25 Axial system variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>$AA_{-}IW$</td>
<td>Axial variable $AA_{-}IW[ax]$ determines the current setpoint in the workpiece coordinate system (WCS) for the specified axis. The setpoint is equivalent to the interpolator output value for the current interpolation cycle. The WCS value contains no axial offset components (DRF, AA_OFF, ext. work offset, etc.).</td>
</tr>
</tbody>
</table>
| $AA_{-}REPOS\_DELAY$ | $AA_{-}REPOS\_DELAY[X]$  
TRUE: Repos suppression is currently active for this axis.  
FALSE: otherwise |

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>$AA_{-}IW$</td>
<td>Axial variable $AA_{-}IW[ax]$ determines the current setpoint in the workpiece coordinate system (WCS) for the specified axis. The setpoint is equivalent to the interpolator output value for the current interpolation cycle. The WCS value contains no axial offset components (DRF, AA_OFF, ext. work offset, etc.).</td>
</tr>
</tbody>
</table>
| $AA_{-}REPOS\_DELAY$ | $AA_{-}REPOS\_DELAY[X]$  
TRUE: Repos suppression is currently active for this axis.  
FALSE: otherwise |

#### $AA_{-}IW$:
- **Type**: DOUBLE
- **Identifier**: $AA_{-}IW[31]$
- **Description**: Axial variable $AA_{-}IW[ax]$ determines the current setpoint in the workpiece coordinate system (WCS) for the specified axis. The setpoint is equivalent to the interpolator output value for the current interpolation cycle. The WCS value contains no axial offset components (DRF, AA_OFF, ext. work offset, etc.).
- **Axis Identifier**: GEOAX, CHANAX, MACHAX, SPINDLE
- **Unit**: Linear / angular position
- **Min.**: DBL_MIN
- **Max.**: DBL_MAX
- **Run-in**: main run, runin slip, Mrun syn
- **Access Rights**: read: XX XXX, write: X X X X X
- **Attributes**: global, block search, link

#### $AA_{-}REPOS\_DELAY$:
- **Type**: BOOL
- **Identifier**: $AA_{-}REPOS\_DELAY[31]$
- **Description**: $AA_{-}REPOS\_DELAY[X]$  
TRUE: Repos suppression is currently active for this axis.  
FALSE: otherwise
- **Axis Identifier**: GEOAX, CHANAX, MACHAX, SPINDLE
- **Unit**: -
- **Min.**: TRUE
- **Max.**: FALSE
- **Run-in**: main run, runin slip, Mrun syn
- **Access Rights**: read: X X, write: X X X X
- **Attributes**: global, block search, link
### $AA\_IEN[31]$

**Description:**
Axial variable $AA\_IEN[ax]$ determines the current setpoint in the settable zero coordinate system (SZS) for the specified axis. See also $AA\_IW[ax]$. The SZS value contains no axial offset components (DRF, AA\_OFF, ext. work offset, etc.).

**Description of field limits:**
To be defined

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>MACHAX</th>
<th>SPINDLE</th>
</tr>
</thead>
</table>

**Unit:** Linear / angular position

<table>
<thead>
<tr>
<th>Min.</th>
<th>DBL_MIN</th>
<th>Max.</th>
<th>DBL_MAX</th>
</tr>
</thead>
</table>

**Run-in**

<table>
<thead>
<tr>
<th>Main Run</th>
<th>Runin Slp</th>
<th>Mrun Syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

**Read:**

- X

**Write:**

- X

**Attributes:**

- Global
- Not classified

---

### $AA\_IBN[31]$

**Description:**
Axial variable $AA\_IBN[ax]$ determines the current setpoint in the basic zero coordinate system (BZS) for the specified axis. See also $AA\_IW[ax]$. The BZS value contains no axial offset components (DRF, AA\_OFF, ext. work offset, etc.).

**Description of field limits:**
To be defined

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>MACHAX</th>
<th>SPINDLE</th>
</tr>
</thead>
</table>

**Unit:** Linear / angular position

<table>
<thead>
<tr>
<th>Min.</th>
<th>DBL_MIN</th>
<th>Max.</th>
<th>DBL_MAX</th>
</tr>
</thead>
</table>

**Run-in**

<table>
<thead>
<tr>
<th>Main Run</th>
<th>Runin Slp</th>
<th>Mrun Syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

**Read:**

- X

**Write:**

- X

**Attributes:**

- Global
- Not classified

---
### DOUBLE $\text{AA_IB}[ax]$

**Description:**
Axial variable $\text{AA_IB}[ax]$ determines the current setpoint in the basic coordinate system (BCS) for the specified axis. See also $\text{AA_IW}[ax]$. The BCS value contains no axial offset components (DRF, $\text{AA_OFF}$, ext. work offset, etc.).

**Description of Field Limits:**
To be defined.

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>MACHAX</th>
<th>SPINDLE</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Unit</th>
<th>Linear / angular position</th>
<th>min.</th>
<th>max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runsh slip</td>
<td>Mrun syn</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>read: XX X X X X X</td>
</tr>
<tr>
<td>write: X X X X X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>global</td>
</tr>
</tbody>
</table>

### DOUBLE $\text{AA_ENCAMPL}[n,ax]$

**Description:**
Available only for SIMODRIVE 611D: $\text{AA_ENCAMPL}[n,ax]$ supplies the percentage gain factor of the amplitude control for diagnostic and monitoring purposes. The standard encoder voltage is $1V = 100\%$, the gain can fluctuate between 0.5V and 1.3V schwanken.

The meaning of the indices are as follows:

<table>
<thead>
<tr>
<th>n: Encoder number</th>
</tr>
</thead>
<tbody>
<tr>
<td>ax: Machine axis</td>
</tr>
</tbody>
</table>

**Description of Field Limits:**
To be defined.

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>MACHAX</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linear / angular position</td>
</tr>
<tr>
<td>run-in</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>read: X X</td>
</tr>
<tr>
<td>write: X X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>global</td>
</tr>
</tbody>
</table>

| Not classified | No restrictions |
### Axial System Variables

#### Axial Variable: $AA\_IM[ax]$ (MCS Value)

- **Description:**
  Axial variable $AA\_IM[ax]$ determines the current setpoint in the machine coordinate system (MCS) for the specified axis. See also $AA\_IW[ax]$. The MCS value contains all axial offset components (DRF, $AA\_OFF$, ext. work offset, etc.).

- **Description of Field Limits:**
  To be defined

- **Axis Identifier:**
  GEOAX, CHANAX, MACHAX, SPINDLE

- **Unit:** Linear / angular position

- **Range:**
  - Min.: DBL_MIN
  - Max.: DBL_MAX

- **Read:**
  - X

- **Write:**
  - X

- **Attributes:**
  - Global
  - Block search
  - Link

#### Axial Variable: $AA\_ACT\_INDEX\_AX\_POS\_NO[X]$ (Indexing Position No.)

- **Description:**
  0: Not an indexing axis, no indexing position is thus available.
  > 0: Number of last reached or last crossed indexing position

- **Description of Field Limits:**
  To be defined

- **Axis Identifier:**
  GEOAX, CHANAX, MACHAX, SPINDLE

- **Unit:**
  - Min.: INT_MIN
  - Max.: INT_MAX

- **Read:**
  - X

- **Write:**
  - X

- **Attributes:**
  - Global
  - Block search
  - Link

- **Note:** Not classified
### 1.25 Axial system variables

<table>
<thead>
<tr>
<th>INT</th>
<th>$AA_PROG_INDEX_AX_POS_NO[31]</th>
<th>description:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$AA_PROG_INDEX_AX_POS_NO[X]</td>
<td>0: Not an indexing axis, no indexing position is thus available or the indexing axis is not currently approaching an indexing position &gt; 0: Number of programmed indexing position</td>
</tr>
<tr>
<td></td>
<td>description of field limits:</td>
<td>to be defined</td>
</tr>
<tr>
<td></td>
<td>axis identifier:</td>
<td>GEOAX, CHANAX, MACHAX, SPINDLE</td>
</tr>
<tr>
<td></td>
<td>NCK version:</td>
<td>13.00.00</td>
</tr>
<tr>
<td></td>
<td>unit:</td>
<td>INT_MIN, INT_MAX</td>
</tr>
<tr>
<td></td>
<td>run-in</td>
<td>main run, runin slip, Mrun syn, PP, SA, OPT, OEM</td>
</tr>
<tr>
<td></td>
<td>read:</td>
<td>X, X, X, X, X, X</td>
</tr>
<tr>
<td></td>
<td>write:</td>
<td>Not classified, Not classified</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BOOL</th>
<th>$AA_ENC_ACTIVE[31]</th>
<th>description:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$AA_ENC_ACTIVE[ax] determines whether the active measuring system is operating below the encoder limit frequency.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>description of field limits:</td>
<td>to be defined</td>
</tr>
<tr>
<td></td>
<td>axis identifier:</td>
<td>GEOAX, CHANAX, MACHAX, SPINDLE</td>
</tr>
<tr>
<td></td>
<td>NCK version:</td>
<td>13.00.00</td>
</tr>
<tr>
<td></td>
<td>unit:</td>
<td>FALSE, TRUE</td>
</tr>
<tr>
<td></td>
<td>run-in</td>
<td>main run, runin slip, Mrun syn, PP, SA, OPT, OEM</td>
</tr>
<tr>
<td></td>
<td>read:</td>
<td>X, X, X, X, X, X</td>
</tr>
<tr>
<td></td>
<td>write:</td>
<td>Not classified, Not classified</td>
</tr>
</tbody>
</table>
### BOOL $AA_ENC1_ACTIVE[31]

<table>
<thead>
<tr>
<th>Description:</th>
<th>Axial variable $AA_ENC1_ACTIVE[ax] determines whether the first measuring system is operating below the encoder limit frequency.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description of field limits:</td>
<td>to be defined</td>
</tr>
<tr>
<td>Axis identifier:</td>
<td>GEOAX, CHANAX, MACHAX, SPINDLE</td>
</tr>
<tr>
<td>NCK version:</td>
<td>13.00.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit:</th>
<th>-</th>
<th>min.: FALSE</th>
<th>max.: TRUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin stp</td>
<td>Mrun syn</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

attributes: global, block search, link
Not classified

### BOOL $AA_ENC2_ACTIVE[31]

<table>
<thead>
<tr>
<th>Description:</th>
<th>Axial variable $AA_ENC2_ACTIVE[ax] determines whether the second measuring system is operating below the encoder limit frequency.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description of field limits:</td>
<td>to be defined</td>
</tr>
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<td>runin stp</td>
<td>Mrun syn</td>
</tr>
<tr>
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<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
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attributes: global, block search, link
Not classified
### 1.25 Axial system variables

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<tr>
<th>DOUBLE</th>
<th>$VA_{\text{IM}[31]}</th>
<th>description:</th>
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</table>
| Axial variable $VA_{\text{IM}}[\text{ax}]$ determines the encoder actual value (measured by active measuring system) in the machine coordinate system (MCS). All actual value compensations are corrected (leadscrew error compensation, backlash compensation, quadrant error compensation).

When a spindle or axis disable is active, this variable returns the current setpoint by definition. If it is preferred to return the actual value in this situation, BIT3 in $MA_{\text{MISC\_FUNCTION\_MASK}}$ must be set.

**description of field limits:**

- **axis identifier:** GEOAX, CHANAX, MACHAX, SPINDLE
- **NCK version:** 13.00.00
- **unit:** Linear / angular position
- **min.:** DBL_MIN
- **max.:** DBL_MAX
- **read:** X X X X X X
- **write:**
  - attributes: global block search link
  - access rights: Not classified Not classified

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<thead>
<tr>
<th>DOUBLE</th>
<th>$VA_{\text{IM1}[31]}</th>
<th>description:</th>
</tr>
</thead>
</table>
| Axial variable $VA_{\text{IM1}}[\text{ax}]$ determines the encoder actual value (measured by encoder 1) in the machine coordinate system (MCS). All actual value compensations are corrected (leadscrew error compensation, backlash compensation, quadrant error compensation).

When a spindle or axis disable is active, this variable returns the current setpoint by definition. If it is preferred to return the actual value in this situation, BIT3 in $MA_{\text{MISC\_FUNCTION\_MASK}}$ must be set.

**description of field limits:**

- **axis identifier:** GEOAX, CHANAX, MACHAX, SPINDLE
- **NCK version:** 13.00.00
- **unit:** Linear / angular position
- **min.:** DBL_MIN
- **max.:** DBL_MAX
- **read:** X X X X X X
- **write:**
  - attributes: global block search link
  - access rights: Not classified Not classified
**DOUBLE $VA_{IM2}[31]$**

**description:**
Axial variable $VA_{IM2}[ax]$ determines the encoder actual value (measured by encoder 2) in the machine coordinate system (MCS). All actual value compensations are corrected (leadscrew error compensation, backlash compensation, quadrant error compensation).
When a spindle or axis disable is active, this variable returns the current setpoint by definition. If it is preferred to return the actual value in this situation, BIT3 in $MA_{MISC\_FUNCTION\_MASK}$ must be set.

**description of field limits:**

to be defined

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**unit:** Linear / angular position

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<th>Mrun</th>
<th>syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
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<td>X</td>
<td>X</td>
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<td>X</td>
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<td>write:</td>
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</thead>
<tbody>
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**DOUBLE $VA_{LAG\_ERROR}[31]$**

**description:**
Variable $VA_{LAG\_ERROR}[X]$ supplies the contour-related following error, i.e. position setpoint after fine interpolator actual position value.

**description of field limits:**

to be defined

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**unit:** Linear / angular position

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<th>Mrun</th>
<th>syn</th>
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<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
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### $AA_MW[31]$

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<tr>
<th>Description</th>
<th>Probe measured value in workpiece coordinate system</th>
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</thead>
<tbody>
<tr>
<td>Field limits</td>
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</tr>
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<td>Axis identifier</td>
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<tr>
<td>Unit</td>
<td>Linear / angular position</td>
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<td>X</td>
<td>X</td>
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<td>X</td>
<td>X</td>
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### $AA_MM[31]$

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<th>Mrun syn</th>
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<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>Access rights</th>
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<tbody>
<tr>
<td>Read</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<td>Write</td>
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### 1 System variable

#### 1.25 Axial system variables

<table>
<thead>
<tr>
<th>DOUBLE</th>
<th>$AA_MW1[31]$</th>
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<tbody>
<tr>
<td>$AA_MW1[X]$</td>
<td>Measurement result axial measurement</td>
<td></td>
</tr>
<tr>
<td>Trigger event 1 in WCS</td>
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<td></td>
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**description of field limits:**

to be defined

**axis identifier:**

- GEOAX
- CHANAX
- MACHAX
- SPINDLE

<table>
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<th>NCK version:</th>
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**unit:**

- Linear / angular position

<table>
<thead>
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<th>run-in</th>
<th>main run</th>
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<th>PP</th>
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**attributes:**

- global
- block search

Not classified

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**description of field limits:**

to be defined

**axis identifier:**

- GEOAX
- CHANAX
- MACHAX
- SPINDLE

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**unit:**

- Linear / angular position

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**attributes:**

- global
- block search

Not classified

Not classified
### 1.25 Axial system variables

| DOUBLE | $\text{AA\_MW3}[31]$ | description: |
|--------------------------------------------------|-----------------|
| $\text{AA\_MW3}[X]$ | Measurement result axial measurement |
| Trigger event 3 in WCS | |
| description of field limits: | |
| to be defined | |
| axis identifier: | GEOAX |
| | CHANAX |
| | MACHAX |
| | SPINDLE |
| NCK version: | 13.00.00 |
| unit: | Linear / angular position |
| | min.: DBL\_MIN |
| | max.: DBL\_MAX |
| run-in | main run | runin slp | Mrun syn | PP | SA | OPI | OEM | access rights |
| read: | X | X | X | X | X | X | X | ? |
| write: | X | X | X | X | X | X | X | ? |
| attributes: | global | block search | link | |
| | Not classified | Not classified | |

| DOUBLE | $\text{AA\_MW4}[31]$ | description: |
|--------------------------------------------------|-----------------|
| $\text{AA\_MW4}[X]$ | Measurement result axial measurement |
| Trigger event 4 in WCS | |
| description of field limits: | |
| to be defined | |
| axis identifier: | GEOAX |
| | CHANAX |
| | MACHAX |
| | SPINDLE |
| NCK version: | 13.00.00 |
| unit: | Linear / angular position |
| | min.: DBL\_MIN |
| | max.: DBL\_MAX |
| run-in | main run | runin slp | Mrun syn | PP | SA | OPI | OEM | access rights |
| read: | X | X | X | X | X | X | X | ? |
| write: | X | X | X | X | X | X | X | ? |
| attributes: | global | block search | link | |
| | Not classified | Not classified | |
### DOouble $AA_{MM1}[31]$

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<tr>
<td>Measurement result axial measurement</td>
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<td>Trigger event 1 in MCS</td>
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<table>
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<th>Mrun syn</th>
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<th>SA</th>
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### DOouble $AA_{MM2}[31]$

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<td>Linear / angular position</td>
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<th>Runin slp</th>
<th>Mrun syn</th>
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<th>Write:</th>
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</table>
### DOUBLE $AA\_MM3[31]$

**Description:**
$AA\_MM3[X]$ Measurement result axial measurement
Trigger event 3 in MCS

description of field limits:
to be defined

- **axis identifier:** GEOAX, CHANAX, MACHAX, SPINDLE
- **NCK version:** 13.00.00
- **unit:** Linear / angular position
- **min.:** DBL_MIN
- **max.:** DBL_MAX
- **read:** X X X X X X X
- **write:** X X X X X X X
- **attributes:** global, block, search, link

### DOUBLE $AA\_MM4[31]$

**Description:**
$AA\_MM4[X]$ Measurement result axial measurement
Trigger event 4 in MCS

description of field limits:
to be defined

- **axis identifier:** GEOAX, CHANAX, MACHAX, SPINDLE
- **NCK version:** 13.00.00
- **unit:** Linear / angular position
- **min.:** DBL_MIN
- **max.:** DBL_MAX
- **read:** X X X X X X X
- **write:** X X X X X X X
- **attributes:** global, block, search, link

Not classified

Not classified
### BOOL $AA_MEAACT[31]$

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<tr>
<td>$AA_MEAACT[X]$</td>
</tr>
<tr>
<td>Value is TRUE if axial measurement is active for X</td>
</tr>
<tr>
<td>Corresponds to the NC/PLC interface signal (Messung aktiv)</td>
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<table>
<thead>
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### DOUBLE $AC_DRF[31]$

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<td>Axial variable $AC_DRF[ax]$ determines the axial override value caused by the handwheel (DRF offset)</td>
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### 1.25 Axial System Variables

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<th>Variable</th>
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<td>$$AC_PRESET[31]$</td>
<td>axial variable $AC_PRESET[ax]$ determines the last defined PRESET value.</td>
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<tr>
<td>$$AA_ETRANS[31]$</td>
<td>axial variable $AA_ETRANS[ax]$ is used to enter an external work offset which can be activated by the PLC. After activation by the PLC, the offset value is traversed as an axial override in the next block.</td>
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#### $\$AC\_PRESET[31]$ Description:

Axial variable $AC\_PRESET[ax]$ determines the last defined PRESET value.

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<th>Run-in Stop</th>
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<th>OPT</th>
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#### $\$AA\_ETRANS[31]$ Description:

Axial variable $AA\_ETRANS[ax]$ is used to enter an external work offset which can be activated by the PLC. After activation by the PLC, the offset value is traversed as an axial override in the next block.

If Bit 1 is set in $MC\_MM\_SYSTEM\_FRAME\_MASK$, an active movement is stopped immediately, on activation by the PLC, the preprocessor is reorganized, and the system frame is initialized with the axis value of $AA\_ETRANS[ax]$ and is activated. The offset is traversed before resuming the interrupted movement. The external work offset has an absolute effect on the translation of the current system frame. Multiple activation is thus not additive; only the coarse component of the translation (not the fine offset) is overwritten with the value from $AA\_ETRANS[ax]$.

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<th>Axis Identifier</th>
<th>Description</th>
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<th>Run-in Stop</th>
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<th>SA</th>
<th>OPT</th>
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Not classified

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SINUMERIK 840D sl/840Di sl/ 840D/ 840Di, List of System Variables (PGA1), 01/2008

1-463
INT $AA_MEAS_P1_VALID[31]

description:
Variable for workpiece and tool measurement.
Axial variable $AA_MEAS_P1_VALID[ax]$ is used to unlatch the current axis position with reference to a selected coordinate system. Variable $AC_MEAS_P1_COORD$ is used to select the coordinate system.
Application:
$AA_MEAS_P1_VALID[ax] = 0$ ; 1st measuring point of axis is invalid
$AA_MEAS_P1_VALID[ax] = 1$ ; Determining 1st measuring point of axis
The unlatched measuring point is stored in $AA_MEAS_POINT1[ax]$.
description of field limits:
to be defined

axis identifier: GEOAX CHANAX MACHAX SPINDLE
NCK version: 43.00.00
unit: _ min.: max.: 1
run-in main run runin stop Mrun syn PP SA OPI OEM access rights
read: X X X X X
write: X X X X X 7
attributes: global block search link
Not classified Not classified

INT $AA_MEAS_P2_VALID[31]

description:
Variable for workpiece and tool measurement.
Axial variable $AA_MEAS_P2_VALID[ax]$ is used to unlatch the current axis position with reference to a selected coordinate system. Variable $AC_MEAS_P2_COORD$ is used to select the coordinate system.
Application:
$AA_MEAS_P2_VALID[ax] = 0$ ; 2nd measuring point of axis is invalid
$AA_MEAS_P2_VALID[ax] = 1$ ; Determining 2nd measuring point of axis
The unlatched measuring point is stored in $AA_MEAS_POINT2[ax]$.
description of field limits:
to be defined

axis identifier: GEOAX CHANAX MACHAX SPINDLE
NCK version: 43.00.00
unit: _ min.: max.: 1
run-in main run runin stop Mrun syn PP SA OPI OEM access rights
read: X X X X X
write: X X X X X 7
attributes: global block search link
Not classified Not classified
### $AA_MEAS_P3_VALID[31]$

**Description:**
Variable for workpiece and tool measurement.
Axial variable $AA_MEAS_P3_VALID[ax]$ is used to unlatch the current axis position with reference to a selected coordinate system. Variable $AC_MEAS_P3COORD$ is used to select the coordinate system.

**Application:**
- $AA_MEAS_P3_VALID[ax] = 0$ ; 3rd measuring point of axis is invalid
- $AA_MEAS_P3_VALID[ax] = 1$ ; Determining 3rd measuring point of axis

The unlatched measuring point is stored in $AA_MEAS_POINT3[ax]$.

**Description of field limits:**
- To be defined

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### $AA_MEAS_P4_VALID[31]$

**Description:**
Variable for workpiece and tool measurement.
Axial variable $AA_MEAS_P4_VALID[ax]$ is used to unlatch the current axis position with reference to a selected coordinate system. Variable $AC_MEAS_P4COORD$ is used to select the coordinate system.

**Application:**
- $AA_MEAS_P4_VALID[ax] = 0$ ; 4th measuring point of axis is invalid
- $AA_MEAS_P4_VALID[ax] = 1$ ; Determining 4th measuring point of axis

The unlatched measuring point is stored in $AA_MEAS_POINT4[ax]$.

**Description of field limits:**
- To be defined

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### DOUBLE $\text{AA_MEAS\_POINT3[31]}$

| Description: |
| Variable for workpiece and tool measurement. Axial variable $\text{AA\_MEAS\_POINT3[ax]}$ is used to write the 3rd measuring point for workpiece and tool measurement. The measuring point can be either written directly or unlatched with variables $\text{AC\_MEAS\_LATCH[2], AA\_MEAS\_P3\_VALID[ax]}$. |
| Application: |
| $\text{AA\_MEAS\_POINT3[x]} = \text{AA\_IW[x]}$ |
| $\text{AA\_MEAS\_POINT3[y]} = \text{AA\_IW[y]}$ |
| $\text{AA\_MEAS\_POINT3[z]} = \text{AA\_IW[z]}$ |
| Description of field limits: |
| to be defined |

| Axis identifier: |
| GEOAX |
| CHANAX |
| MACHAX |
| SPINDLE |

| Unit: |
| Linear / angular position |
| min.: DBL_MIN |
| max.: DBL_MAX |

| Run-in: |
| main run runin stp Mrun syn PP SA OPI OEM access rights |
| read: X X |
| write: X X |

| Attributes: |
| global block search link |

| Not classified |

### DOUBLE $\text{AA\_MEAS\_POINT4[31]}$

| Description: |
| Variable for workpiece and tool measurement. Axial variable $\text{AA\_MEAS\_POINT4[ax]}$ is used to write the 4th measuring point for workpiece and tool measurement. The measuring point can be either written directly or unlatched with variables $\text{AC\_MEAS\_LATCH[3], AA\_MEAS\_P4\_VALID[ax]}$. |
| Application: |
| $\text{AA\_MEAS\_POINT4[x]} = \text{AA\_IW[x]}$ |
| $\text{AA\_MEAS\_POINT4[y]} = \text{AA\_IW[y]}$ |
| $\text{AA\_MEAS\_POINT4[z]} = \text{AA\_IW[z]}$ |
| Description of field limits: |
| to be defined |

| Axis identifier: |
| GEOAX |
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| MACHAX |
| SPINDLE |

| Unit: |
| Linear / angular position |
| min.: DBL_MIN |
| max.: DBL_MAX |

| Run-in: |
| main run runin stp Mrun syn PP SA OPI OEM access rights |
| read: X X |
| write: X X |

| Attributes: |
| global block search link |

| Not classified |

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SINUMERIK 840D sl/840Di sl/ 840D/ 840Di, List of System Variables (PGA1), 01/2008
### INT $AA_MEAS_SP_VALID[31]

**Description:**
Variable for workpiece and tool measurement. Axial variable $AA_MEAS_SP_VALID[ax]$ is used to set the defined setpoint of an axis to valid or invalid.

**Application:**
- $AA_MEAS_SP_VALID[ax] = 0$ ; Position setpoint of axis is invalid
- $AA_MEAS_SP_VALID[ax] = 1$ ; Position setpoint of axis is valid

The position setpoint is stored in $AA_MEAS_SETPOINT[ax]$

**Description of field limits:**
To be defined

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<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>main run</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>runin stp</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mrun syn</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PP</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SA</td>
<td></td>
<td></td>
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<tr>
<td>OEM</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OPI</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>OEM</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### DOUBLE $AA_MEAS_SETPOINT[31]

**Description:**
Variable for workpiece and tool measurement. Axial variable $AA_MEAS_SETPOINT[ax]$ is used to define a position setpoint for an axis. This position setpoint is considered when calculating the workpiece position or the tool length.

**Application:**
- $AA_MEAS_SETPOINT[x] = 0.0$
- $AA_MEAS_SETPOINT[y] = 0.0$
- $AA_MEAS_SETPOINT[z] = 0.0$

**Description of field limits:**
To be defined

<table>
<thead>
<tr>
<th>Axis identifier:</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>MACHAX</th>
<th>SPINDLE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit:</strong></td>
<td>Linear/ angular position</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Min.:</strong></td>
<td>DBL_MIN</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Max.:</strong></td>
<td>DBL_MAX</td>
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<td></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Rights</th>
<th>read</th>
<th>write</th>
<th>attributes</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>X</td>
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<td>X</td>
<td>X</td>
</tr>
<tr>
<td>main run</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>runin stp</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mrun syn</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PP</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SA</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>OEM</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OPI</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>OEM</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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SINUMERIK 840D sl/840Di sl/ 840D/ 840Di, List of System Variables (PGA1), 01/2008
### DOUBLES

#### $AA_MEAS_SETANGLE[31]$

<table>
<thead>
<tr>
<th>Description</th>
<th>Variable for workpiece and tool measurement. Axial variable $AA_MEAS_SETANGLE[ax]$ is used to define an angle setpoint for an axis. This angle setpoint is considered when calculating the workpiece position or the tool length.</th>
</tr>
</thead>
</table>
| Application | $AA_MEAS_SETANGLE[x] = 0.0$  
$AA_MEAS_SETANGLE[y] = 0.0$  
$AA_MEAS_SETANGLE[z] = 0.0$ |
| Description of field limits: | to be defined |
| Axis identifier: | GEOAX  
CHANAX  
MACHAX  
SPINDLE |
| Unit: | Linear / angular position |
| Min.: | DBL_MIN |
| Max.: | DBL_MAX |
| Run-in: | main run  
runit  
Mrunit syn |
| Read: | X  
X |
| Write: | X  
X  
| 7 |
| Attributes: | global  
block search  
link |

#### $AA_OFF[31]$

<table>
<thead>
<tr>
<th>Description</th>
<th>Axial variable $AA_OFF[ax]$ is used to overlay a movement for the programmed axis. The behavior of the overlaid movement can be configured with $MA_AA_OFF_MODE$.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description of field limits:</td>
<td>to be defined</td>
</tr>
</tbody>
</table>
| Axis identifier: | GEOAX  
CHANAX  
MACHAX  
SPINDLE |
| Unit: | Linear / angular position |
| Min.: | DBL_MIN |
| Max.: | DBL_MAX |
| Run-in: | main run  
runit  
Mrunit syn |
| Read: | X  
X  
X |
| Write: | X  
X  
| 7 |
| Attributes: | global  
block search  
link |

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SINUMERIK 840D sl/840Di sl/ 840D/ 840Di, List of System Variables (PGA1), 01/2008
### INT $AA_OFF_LIMIT[31]$

| Description: | Axial variable $AA_OFF_LIMIT[ax]$ is used to interrogate a limit value for the axis offset $AA_OFF[ax]$. The following values are possible: 0: Limit value not reached 1: Limit value reached in positive axis direction -1: Limit value reached in negative axis direction |
| NCK version: | 13.00.00 |
| Unit: | - |
| Min.: | -1 |
| Max.: | 1 |
| Run-in | X |
| Main Run | X |
| Runin Slp | X |
| Mrun Syn | X |
| Pp | X |
| Sa | X |
| Opt | X |
| OEM | X |
| Access Rights | |
| Attributes: | Global Block Search Link |
| Not Classified: | Not Classified |

### DOUBLE $AA_OFF_VAL[31]$

| Description: | Axial variable $AA_OFF_VAL[ax]$ determines the integrated value of the overlaid movement for an axis. An overlaid movement can be canceled again by means of the negative value of this variable. e.g. $AA_OFF[axis] = -$AA_OFF_VAL[axis] |
| NCK version: | 20.00.00 |
| Unit: | - |
| Min.: | DBL_MIN |
| Max.: | DBL_MAX |
| Run-in | X |
| Main Run | X |
| Runin Slp | X |
| Mrun Syn | X |
| Pp | X |
| Sa | X |
| Opt | X |
| OEM | X |
| Access Rights | |
| Attributes: | Global Block Search Link |
| Not Classified: | Not Classified |
### DOUBLE $AC\_RETPOINT[31]$

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$AC_RETPOINT[X]$ supplies the WCS position of an axis at which an ASUB has been started. The axis can then be repositioned at this point in the Asub.</td>
</tr>
<tr>
<td>If an Asub is started immediately after a block search with calculation, $AC_RETPOINT$ then supplies the collected search position.</td>
</tr>
<tr>
<td>For a modulo axis $AC_RETPOINT[]$ supplies the position as modulo converted.</td>
</tr>
<tr>
<td>System variable $AC_RPVALID[]$ can be used to check whether $AC_RETPOINT[]$ is supplying a valid repositioning point within the current program context (see documentation for $AC_RPVALID[]$).</td>
</tr>
</tbody>
</table>

Note about application in synchronized actions:
The points generated by REPOS are supplied while the REPOS approach blocks are being processed. The current parameter settings for the REPOS operation (approach to interruption point, block start point, etc.) defined by G codes RMI, RMB, RME, RMN or VDI signal are also taken into account.

### Description of field limits:

<table>
<thead>
<tr>
<th>Axis Identifier:</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>MACHAX</th>
<th>SPINDLE</th>
<th>NCK version:</th>
<th>06.00.00</th>
<th>Unit: Linear / angular position</th>
<th>min.:</th>
<th>DBL_MIN</th>
<th>max.:</th>
<th>DBL_MAX</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in main run runin sip Min. sym PP SA OPI OEM access rights</td>
<td>read: X X X X</td>
<td>write:</td>
<td>attributes: global block search</td>
<td>link</td>
<td>Not classified</td>
<td>Not classified</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**DOUBLE $AA_TOFF[31]**

| description: | Variable $AA_TOFF[geo axis]$ is used to overlay a movement in the corresponding tool direction. The behavior of the overlaid movement can be configured with $MC_TOFF_MODE$. Activation in the part program is performed using the TOFFON instruction. The TOFFOF instruction can be used to reset the offset values.

The velocity for the offset can be defined with MD 21194 TOFF_VELO; the acceleration can be defined with MD21196 TOFF_ACCEL.

The variable is only appropriate in conjunction with an active orientation transformation or an active toolholder.

<table>
<thead>
<tr>
<th>description of field limits:</th>
<th>to be defined</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>GEOAX</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>unit:</th>
<th>mm</th>
<th>min.:</th>
<th>max.:</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin slip</td>
<td>Mrun syn</td>
</tr>
<tr>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>read:</th>
<th>write:</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>attributes:</th>
<th>global</th>
<th>block search</th>
<th>link</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not classified</td>
<td>Not classified</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**DOUBLE $AA_TOFF_VAL[31]**

| description: | Variable $AA_TOFF_VAL[geo axis]$ determines the integrated value of the overlaid movement in the corresponding tool direction. The variable is only appropriate in conjunction with an active orientation transformation or an active toolholder.

<table>
<thead>
<tr>
<th>description of field limits:</th>
<th>to be defined</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>GEOAX</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>unit:</th>
<th>mm</th>
<th>min.:</th>
<th>max.:</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin slip</td>
<td>Mrun syn</td>
</tr>
<tr>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>read:</th>
<th>write:</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>attributes:</th>
<th>global</th>
<th>block search</th>
<th>link</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not classified</td>
<td>Not classified</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Axial System Variables

#### $AA_TOFF_LIMIT[31]$

**Description:**
Axial variable $AA_TOFF_LIMIT[ax]$ is used to interrogate a limit value for the offset in the tool direction (TCS) via $AA_TOFF[geo~axis]$.

The following values are possible:
- 0: Limit value not reached
- 1: Limit value reached in positive axis direction
- -1: Limit value reached in negative axis direction

The limit values can be defined with SD 42970 TOFF_LIMIT.

The variable is only appropriate in conjunction with an active orientation transformation or an active toolholder.

**Description of Field Limits:**
- **Axis Identifier:** GEOAX
- **Unit:** -
- **Min.:** -1
- **Max.:** 1
- **Run-in:**
  - **Main Run:** X
  - **Runin Step:** X
  - **Mrun Syn:** X
  - **PP:** X
  - **SA:** X
  - **OPI:** X
  - **OEM:** X
  - **Access Rights:** Not classified

#### $AA_TOFF_PREPDIFF[31]$

**Description:**
Variable $AA_TOFF_PREP_DIFF[geo~axis]$ determines the difference value of the overlaid movement in the corresponding tool direction between the main run and preprocessing run.

The variable is only appropriate in conjunction with an active orientation transformation or an active toolholder.

**Description of Field Limits:**
- **Axis Identifier:** GEOAX
- **Unit:** mm
- **Min.:** DBL_MIN
- **Max.:** DBL_MAX
- **Run-in:**
  - **Main Run:** X
  - **Runin Step:** X
  - **Mrun Syn:** X
  - **PP:** X
  - **SA:** X
  - **OPI:** X
  - **OEM:** X
  - **Access Rights:** Not classified
### $\text{AA\_SOFTENDP}[X]$

**Current software limit position, positive direction**

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>MACHAX</th>
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<tbody>
<tr>
<td>NCK version</td>
<td></td>
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<tr>
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<td>Linear / angular position</td>
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<td>DBL_MAX</td>
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<tr>
<td>run-in</td>
<td>main run</td>
<td>runin stp</td>
<td>Mrun syn</td>
<td>PP</td>
</tr>
<tr>
<td>read</td>
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<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>write</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>attributes</td>
<td>global</td>
<td>block search</td>
<td>link</td>
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</tr>
<tr>
<td>access rights</td>
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<td>Not classified</td>
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</table>

### $\text{AA\_SOFTENDN}[X]$

**Software limit position, negative direction**

<table>
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<tr>
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<th>CHANAX</th>
<th>MACHAX</th>
<th>SPINDLE</th>
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</thead>
<tbody>
<tr>
<td>NCK version</td>
<td></td>
<td></td>
<td></td>
<td>06.00.00</td>
</tr>
<tr>
<td>unit</td>
<td>Linear / angular position</td>
<td>DBL_MIN</td>
<td></td>
<td>DBL_MAX</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin stp</td>
<td>Mrun syn</td>
<td>PP</td>
</tr>
<tr>
<td>read</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write</td>
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<tr>
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<td>global</td>
<td>block search</td>
<td>link</td>
<td></td>
</tr>
<tr>
<td>access rights</td>
<td>Not classified</td>
<td>Not classified</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### DOUBLE $AA_DTBW[31]$

**description:**
Axial variable $AA_DTBW[ax]$ determines the axial distance from the start of the block in the workpiece coordinate system for positioning and synchronized axes. The programmed position is the only factor used to calculate the distance. If the axis is a coupled axis, the position component derived from the axis coupling is not considered.

**description of field limits:**
to be defined

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>MACHAX</th>
<th>SPINDLE</th>
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<tr>
<td>max.</td>
<td>DBL_MAX</td>
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<tr>
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<td>runin stp</td>
<td>Mrun syn</td>
<td>PP</td>
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<td>write</td>
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<tr>
<td>attributes</td>
<td>global</td>
<td>block search</td>
<td>link</td>
<td></td>
</tr>
</tbody>
</table>

### DOUBLE $AA_DTBB[31]$

**description:**
Axial variable $AA_DTBBB[ax]$ determines the axial distance from the start of the block in the basic coordinate system for positioning and synchronized axes. The programmed position is the only factor used to calculate the distance. If the axis is a coupled axis, the position component derived from the axis coupling is not considered.

**description of field limits:**
to be defined

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>MACHAX</th>
<th>SPINDLE</th>
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</tr>
<tr>
<td>unit</td>
<td>Linear / angular position</td>
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<td></td>
<td></td>
</tr>
<tr>
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<td>DBL_MIN</td>
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<tr>
<td>max.</td>
<td>DBL_MAX</td>
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<td></td>
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<tr>
<td>run-in</td>
<td>main run</td>
<td>runin stp</td>
<td>Mrun syn</td>
<td>PP</td>
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<tr>
<td>read</td>
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<tr>
<td>attributes</td>
<td>global</td>
<td>block search</td>
<td>link</td>
<td></td>
</tr>
</tbody>
</table>

Not classified
DOUBLE $AA_DTEW[31]$

description:
Axial variable $AA_DTEW[ax]$ determines the axial distance to the end of the block in the workpiece coordinate system for positioning and synchronized axes. The programmed position is the only factor used to calculate the distance. If the axis is a coupled axis, the position component derived from the axis coupling is not considered.
description of field limits:
to be defined
axis identifier:
- GEOAX
- CHANAX
- MACHAX
- SPINDLE

unit:
- Linear / angular position
- run-in
- main run
- runin slp
- Mrun syn
- PP
- SA
- OP
- OEM

access rights
read: X X X X X
write: X X X X X
attributes: global block search link Not classified Not classified

DOUBLE $AA_DTEB[31]$

description:
Axial variable $AA_DTEB[ax]$ determines the axial distance to the end of the block in the basic coordinate system for positioning and synchronized axes. The programmed position is the only factor used to calculate the distance. If the axis is a coupled axis, the position component derived from the axis coupling is not considered.
description of field limits:
to be defined
axis identifier:
- GEOAX
- CHANAX
- MACHAX
- SPINDLE

unit:
- Linear / angular position
- run-in
- main run
- runin slp
- Mrun syn
- PP
- SA
- OP
- OEM

access rights
read: X X X X X
write: X X X X X
attributes: global block search link Not classified Not classified
### 1.25 Axial system variables

**DOUBLE $AA_DTEPW[31]$**

<table>
<thead>
<tr>
<th>Description</th>
<th>Axial variable $AA_DTEPW[ax]$ determines the axial distance to go for the infeed reciprocation in the workpiece coordinate system.</th>
</tr>
</thead>
</table>

**Description of field limits:**

<table>
<thead>
<tr>
<th>Axis identifier</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>MACHAX</th>
<th>SPINDLE</th>
</tr>
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<tbody>
<tr>
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<td></td>
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<table>
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<tr>
<th>Unit</th>
<th>Linear / angular position</th>
<th>min.</th>
<th>DBL_MIN</th>
<th>max.</th>
<th>DBL_MAX</th>
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</table>

<table>
<thead>
<tr>
<th>Run-in</th>
<th>main run</th>
<th>runin slp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
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</tr>
</tbody>
</table>

**Attributes:** global block search sink

Not classified

**DOUBLE $AA_DTEPB[31]$**

<table>
<thead>
<tr>
<th>Description</th>
<th>Axial variable $AA_DTEPB[ax]$ determines the axial distance to go for the infeed reciprocation in the basic coordinate system.</th>
</tr>
</thead>
</table>

**Description of field limits:**

<table>
<thead>
<tr>
<th>Axis identifier</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>MACHAX</th>
<th>SPINDLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCK version</td>
<td>06.00.00</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit</th>
<th>Linear / angular position</th>
<th>min.</th>
<th>DBL_MIN</th>
<th>max.</th>
<th>DBL_MAX</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Run-in</th>
<th>main run</th>
<th>runin slp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

**Attributes:** global block search sink

Not classified
### $AA\_OSCILL\_REVERSE\_POS1[31]$  
**description:**
Supplies current reversal position 1 for reciprocation.
In synchronized actions, the value of setting data $SA\_OSCILL\_REVERSE\_POS1$ is evaluated online.
The variable can be accessed only from synchronized actions.

**axis identifier:** GEOAX, CHANAX, MACHAX  
**NCK version:** 06.00.00  
**unit:** Linear / angular position  
**min.:** DBL\_MIN  
**max.:** DBL\_MAX  
**run-in** main run runn slp Mrun syn PP SA OP1 OEM access rights  
**read:** X X X X  
**write:**  
**attributes:** global block search link  
**Not classified**

### $AA\_OSCILL\_REVERSE\_POS2[31]$  
**description:**
Supplies current reversal position 2 for reciprocation.
In synchronized actions, the value of setting data $SA\_OSCILL\_REVERSE\_POS2$ is evaluated online.
The variable can be accessed only from synchronized actions.

**axis identifier:** GEOAX, CHANAX, MACHAX  
**NCK version:** 06.00.00  
**unit:** Linear / angular position  
**min.:** DBL\_MIN  
**max.:** DBL\_MAX  
**run-in** main run runn slp Mrun syn PP SA OP1 OEM access rights  
**read:** X X X X  
**write:**  
**attributes:** global block search link  
**Not classified**
### 1.25 Axial system variables

**DOUBLE $AA\_DELT[31]$**

<table>
<thead>
<tr>
<th>description:</th>
<th>Stored axial distance to go in workpiece coordinate system after axial delete distance to go by a motion-synchronous action.</th>
</tr>
</thead>
<tbody>
<tr>
<td>description of field limits:</td>
<td>to be defined</td>
</tr>
<tr>
<td>axis identifier:</td>
<td>GEOAX, CHANAX, MACHAX, SPINDLE</td>
</tr>
<tr>
<td>NCK version:</td>
<td>06.00.00</td>
</tr>
<tr>
<td>unit:</td>
<td>Linear / angular position</td>
</tr>
<tr>
<td>min.:</td>
<td>DBL_MIN</td>
</tr>
<tr>
<td>max.:</td>
<td>DBL_MAX</td>
</tr>
<tr>
<td>run-in</td>
<td>main run, runin stp, Mrun syn, PP, SA, OPI, OEM</td>
</tr>
<tr>
<td>access rights</td>
<td>read: X, X, X, X, X, X, X</td>
</tr>
<tr>
<td>write:</td>
<td></td>
</tr>
<tr>
<td>attributes:</td>
<td>global, block search, link</td>
</tr>
</tbody>
</table>

**DOUBLE $P\_FA[31]$**

| description: | Last programmed axial feedrate |
| description of field limits: | to be defined |
| axis identifier: | GEOAX, CHANAX, MACHAX, SPINDLE |
| NCK version: | 06.00.00 |
| unit: | Linear / angular speed |
| min.: | DBL_MIN |
| max.: | DBL_MAX |
| run-in | main run, runin stp, Mrun syn, PP, SA, OPI, OEM |
| access rights | read: X, X, X, X, X, X, X |
| write: | |
| attributes: | global, block search, link |

Not classified Not classified
### $AA_OVR[<axis>]$

**Description:** Axial override for motion-synchronous actions.

Multiplicative override component, applied in addition to operator override, programmed override and transformational override.

The value is limited to max. 200%. If a value of < 0.0 is entered, it is assumed to be 0 and alarm 14756 is output.

$AA_OVR[<axis>]$ must be rewritten in every Ipo cycle or else a value of 100% is applied. Variable $AA_OVR[<spindle>]$ alters the spindle override.

The variable can be accessed only from motion-synchronous actions.

### $AA_PLC_OVR[ax]$

**Description:** Supplies the axial override defined by the PLC.

### Field Limitation

- **Axis Identifier:** GEOAX, CHANAX, MACHAX, SPINDLE
- **Unit:** -
- **Min.:**
- **Max.:** DBL_MAX
- **Access Rights:**
  - Read: X XXX
  - Write: XX X 7
- **Attributes:**
  - Global: Not classified
  - Block Search: Not classified
  - Link: Not classified

---

<table>
<thead>
<tr>
<th>$AA_OVR[31]$</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description:</td>
<td></td>
</tr>
</tbody>
</table>

$AA_OVR[<axis>]$ Axial override for motion-synchronous actions. Multiplicative override component, applied in addition to operator override, programmed override and transformational override. The value is limited to max. 200%. If a value of < 0.0 is entered, it is assumed to be 0 and alarm 14756 is output. $AA_OVR[<axis>]$ must be rewritten in every Ipo cycle or else a value of 100% is applied. Variable $AA_OVR[<spindle>]$ alters the spindle override. The variable can be accessed only from motion-synchronous actions.

### Field Limitation

- **Axis Identifier:** GEOAX, CHANAX, MACHAX, SPINDLE
- **Unit:** -
- **Min.:**
- **Max.:** DBL_MAX
- **Access Rights:**
  - Read: X XXX
  - Write: XX X 7
- **Attributes:**
  - Global: Not classified
  - Block Search: Not classified
  - Link: Not classified

---

<table>
<thead>
<tr>
<th>$AA_PLC_OVR[31]$</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description:</td>
<td></td>
</tr>
</tbody>
</table>

$AA_PLC_OVR[ax]$ supplies the axial override defined by the PLC. Description of field limits:

**To be defined**

- **Axis Identifier:** CHANAX
- **Unit:** -
- **Min.:**
- **Max.:** DBL_MAX
- **Access Rights:**
  - Read: X
  - Write: X X X
- **Attributes:**
  - Global: Not classified
  - Block Search: Not classified
  - Link: Not classified

---

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SINUMERIK 840D sl/840Di sl' 840D/ 840Di, List of System Variables (PGA1), 01/2008
<table>
<thead>
<tr>
<th>DOUBLE</th>
<th>$AA_TOTAL_OVR[31]</th>
<th>description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$AA_TOTAL_OVR[ax]$ supplies the overall axial override (PLC_OVR*NC_OVR).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>description of field limits:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>to be defined</td>
<td></td>
<td></td>
</tr>
<tr>
<td>axis identifier:</td>
<td>CHANAX</td>
<td>NCK version:</td>
</tr>
<tr>
<td>unit:</td>
<td>-</td>
<td>min.:</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin slp</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
</tr>
<tr>
<td>Not classified</td>
<td>Not classified</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DOUBLE</th>
<th>$AA_VC[31]</th>
<th>description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>The override value must be rewritten in every Ipq cycle or else a value of 0 is applied.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A setting of 0 makes the override inoperative and is not applied to the override value.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The total feedrate cannot be made negative by an override value.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>An upper limit is applied to ensure that the maximum axis velocities and acceleration rates cannot be exceeded.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The calculation of other feed components is not affected by $AA_VC$.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The override values defined by machine data: $MN_OVR_FACTOR_LIMIT_BIN$, $MN_OVR_FACTOR_FEEDRATE[30]$, $MN_OVR_FACTOR_AX_SPEED[30]$, and $MN_OVR_FACTOR_SPIND_SPEED$ cannot be exceeded. The additive feedrate override is limited such that the resultant feedrate does not exceed the maximum override value of the programmed feedrate.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The variable can be accessed only from synchronized actions.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>description of field limits:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>to be defined</td>
<td></td>
<td></td>
</tr>
<tr>
<td>axis identifier:</td>
<td>GEOAX, CHANAX, MACHAX, SPINDLE</td>
<td></td>
</tr>
<tr>
<td>unit:</td>
<td>Linear / angular speed</td>
<td>min.:</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin slp</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
</tr>
<tr>
<td>Not classified</td>
<td>Not classified</td>
<td></td>
</tr>
</tbody>
</table>
### $AA_VACTB[31]$

**Description:**
Axial variable $AA_VACTB[ax]$ determines the axis velocity in the basic coordinate system.

**Description of field limits:**
To be defined

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>Unit</th>
<th>Min.</th>
<th>Max.</th>
<th>Run-in</th>
<th>Main Run</th>
<th>Runin Stp</th>
<th>Mrun Syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOAX</td>
<td>Linear / angular speed</td>
<td>DBL_MIN</td>
<td>DBL_MAX</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Attributes:**
Global, Block Search, Link

### $AA_VACTW[31]$

**Description:**
Axial variable $AA_VACTW[ax]$ determines the axis velocity in the workpiece coordinate system.

**Description of field limits:**
To be defined

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>Unit</th>
<th>Min.</th>
<th>Max.</th>
<th>Run-in</th>
<th>Main Run</th>
<th>Runin Stp</th>
<th>Mrun Syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOAX</td>
<td>Linear / angular speed</td>
<td>DBL_MIN</td>
<td>DBL_MAX</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Attributes:**
Global, Block Search, Link

**Not classified**
1.25 Axial system variables

DOUBLE $AA_VACTM[31]

description:
Axial variable $AA_VACTM[ax] determines the axis velocity on the setpoint side in the machine coordinate system. The variable also returns valid values for replacement and PLC axes.

description of field limits:
to be defined

axis identifier: GEOAX CHANAX MACHAX SPINDLE

unit: Linear / angular speed

min.: DBL_MIN max.: DBL_MAX

run-in main run runin slp Mrun syn PP SA OPI OEM access rights
read: X X X X
write: X X X

attributes: global block search link

Not classified Not classified

DOUBLE $VA_VACTM[31]

description:
Axial variable $VA_VACTM[ax] determines the axis velocity actual value in the machine coordinate system. The variable supplies an undefined value if the encoder limit frequency is exceeded. When a spindle/axis disable is active, this variable returns the current velocity setpoint. If it is preferred to return the actual velocity in this situation, BIT3 in $MA_MISC_FUNCTION_MASK must be set.

description of field limits:
to be defined

axis identifier: GEOAX CHANAX MACHAX SPINDLE

unit: Linear / angular speed

min.: DBL_MIN max.: DBL_MAX

run-in main run runin slp Mrun syn PP SA OPI OEM access rights
read: X X X X
write: X X X

attributes: global block search link

Not classified Not classified
### $AA\_LOAD[31]$  
**Description:**
Drive utilization in %
Only available for SIMODRIVE 611D and PROFIdrive drives.
On the PROFIdrive, the value must be explicitly provided by the drive, and transmitted through the bus by variable telegram configuration.

**Field Limits:**
- **Axis Identifier:** GEOAX, CHANAX, MACHAX, SPINDLE
- **Unit:** -
- **Min.:** -100
- **Max.:** 100

**Access Rights:**
- **Read:** X X X X X X
- **Write:**

**Attributes:** global block search sink

**Current Value:** Not classified

### $VA\_LOAD[31]$  
**Description:**
Drive load in %
Available only for SIMODRIVE 611D and PROFIdrive drives.
On the PROFIdrive, the value must be explicitly provided by the drive, and transmitted through the bus by variable telegram configuration.

**Field Limits:**
- **Axis Identifier:** GEOAX, CHANAX, MACHAX, SPINDLE
- **Unit:** -
- **Min.:** -100
- **Max.:** 100

**Access Rights:**
- **Read:** X X X X X X
- **Write:**

**Attributes:** global block search sink

**Current Value:** Not classified
## 1.25 Axial system variables

<table>
<thead>
<tr>
<th>DOUBLE</th>
<th>$AA_TORQUE[31]$</th>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$AA_TORQUE[X]$</td>
<td>Drive torque setpoint in Nm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>or actual force in N (only for SIMODRIVE 611D HLA)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Available only for SIMODRIVE 611D and PROFIdrive drives.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>On the PROFIdrive, the value must be explicitly provided by the drive, and transmitted through the bus by variable m,essage frame configuration.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description of field limits:</th>
</tr>
</thead>
<tbody>
<tr>
<td>to be defined</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Axis identifier:</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>MACHAX</th>
<th>SPINDLE</th>
<th>NCK version:</th>
<th>06.00.00</th>
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</table>

<table>
<thead>
<tr>
<th>Unit:</th>
<th>min.:</th>
<th>max.:</th>
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</thead>
<tbody>
<tr>
<td>run-in</td>
<td>DBL_MIN</td>
<td>DBL_MAX</td>
</tr>
<tr>
<td>main run</td>
<td>runn slp</td>
<td>Mrun syn</td>
</tr>
</tbody>
</table>

| Read: | X | X | X | X | X | X |
| Write: | X | X | X | X | X | X |

<table>
<thead>
<tr>
<th>Attributes:</th>
<th>global</th>
<th>block search</th>
<th>link</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current value</td>
<td>Not classified</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DOUBLE</th>
<th>$VA_TORQUE[31]$</th>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$VA_TORQUE[X]$</td>
<td>Drive torque setpoint in Nm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>or actual force in N (only for SIMODRIVE 611D HLA)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Available only for SIMODRIVE 611D and PROFIdrive drives.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>On the PROFIdrive, the value must be explicitly provided by the drive, and transmitted through the bus by variable telegram configuration.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description of field limits:</th>
</tr>
</thead>
<tbody>
<tr>
<td>to be defined</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Axis identifier:</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>MACHAX</th>
<th>SPINDLE</th>
<th>NCK version:</th>
<th>17.00.00</th>
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</thead>
</table>

<table>
<thead>
<tr>
<th>Unit:</th>
<th>min.:</th>
<th>max.:</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>DBL_MIN</td>
<td>DBL_MAX</td>
</tr>
<tr>
<td>main run</td>
<td>runn slp</td>
<td>Mrun syn</td>
</tr>
</tbody>
</table>

| Read: | X | X | X | X |
| Write: | X | X | X | X |

<table>
<thead>
<tr>
<th>Attributes:</th>
<th>global</th>
<th>block search</th>
<th>link</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current value</td>
<td>Not classified</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### $AA\_POWER[31]$

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$AA_POWER[x]$</td>
</tr>
<tr>
<td>Drive active power in W</td>
</tr>
<tr>
<td>Available only for SIMODRIVE 611D and PROFIdrive drives.</td>
</tr>
<tr>
<td>On the PROFIdrive, the value must be explicitly provided by the drive, and transmitted through the bus by variable telegram configuration.</td>
</tr>
</tbody>
</table>

#### Description of field limits:
- To be defined
- **Axis identifier:** GEOAX, CHANAX, MACHAX, SPINDLE
- **NCK version:** 06.00.00
- **Units:** -
- **Min.:** DBL\_MIN
- **Max.:** DBL\_MAX
- **Access rights:** run-in main run runin slp Mrun syn PP SA OPI OEM
- **Read:** X X X X X X
- **Write:** X X X
- **Attributes:** global block search sink
- **Current value:** Not classified

### $VA\_POWER[31]$

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$VA_POWER[x]$</td>
</tr>
<tr>
<td>Drive active power in W</td>
</tr>
<tr>
<td>Available only for SIMODRIVE 611D and PROFIdrive drives.</td>
</tr>
<tr>
<td>On the PROFIdrive, the value must be explicitly provided by the drive, and transmitted through the bus by variable telegram configuration.</td>
</tr>
</tbody>
</table>

#### Description of field limits:
- To be defined
- **Axis identifier:** GEOAX, CHANAX, MACHAX, SPINDLE
- **NCK version:** 17.00.00
- **Units:** -
- **Min.:** DBL\_MIN
- **Max.:** DBL\_MAX
- **Access rights:** run-in main run runin slp Mrun syn PP SA OPI OEM
- **Read:** X X X X X
- **Write:** X X X
- **Attributes:** global block search sink
- **Current value:** Not classified
### 1 System variable

#### 1.25 Axial system variables

<table>
<thead>
<tr>
<th>DOUBLE $AA_CURR[31]$</th>
<th>description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$AA_CURR[X]$</td>
<td>Actual current of axis or spindle in A</td>
</tr>
<tr>
<td></td>
<td>Available only for SIMODRIVE 611D and PROFIdrive drives.</td>
</tr>
<tr>
<td></td>
<td>On the PROFIdrive, the value must be explicitly provided by the drive, and transmitted through the bus by variable telegram configuration.</td>
</tr>
<tr>
<td>axis identifier:</td>
<td>GEOAX</td>
</tr>
<tr>
<td></td>
<td>CHANAX</td>
</tr>
<tr>
<td></td>
<td>MACHAX</td>
</tr>
<tr>
<td></td>
<td>SPINDLE</td>
</tr>
<tr>
<td>NCK version:</td>
<td>06.00.00</td>
</tr>
<tr>
<td>unit:</td>
<td>run-in</td>
</tr>
<tr>
<td></td>
<td>main run</td>
</tr>
<tr>
<td></td>
<td>run-in slp</td>
</tr>
<tr>
<td></td>
<td>Mrun syn</td>
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<td></td>
<td>PP</td>
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<tr>
<td></td>
<td>SA</td>
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<tr>
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<td>OPI</td>
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<td></td>
<td>OEM</td>
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<tr>
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<td>access rights</td>
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<td>X</td>
</tr>
<tr>
<td>write:</td>
<td></td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
</tr>
<tr>
<td></td>
<td>block search</td>
</tr>
<tr>
<td></td>
<td>sink</td>
</tr>
<tr>
<td>Current value:</td>
<td>Not classified</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DOUBLE $VA_CURR[31]$</th>
<th>description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$VA_CURR[X]$</td>
<td>Actual current of axis or spindle in A</td>
</tr>
<tr>
<td></td>
<td>Only available for SIMODRIVE 611D and PROFIdrive drives.</td>
</tr>
<tr>
<td></td>
<td>On the PROFIdrive, the value must be explicitly provided by the drive, and transmitted through the bus by variable telegram configuration.</td>
</tr>
<tr>
<td>axis identifier:</td>
<td>GEOAX</td>
</tr>
<tr>
<td></td>
<td>CHANAX</td>
</tr>
<tr>
<td></td>
<td>MACHAX</td>
</tr>
<tr>
<td></td>
<td>SPINDLE</td>
</tr>
<tr>
<td>NCK version:</td>
<td>17.00.00</td>
</tr>
<tr>
<td>unit:</td>
<td>run-in</td>
</tr>
<tr>
<td></td>
<td>main run</td>
</tr>
<tr>
<td></td>
<td>run-in slp</td>
</tr>
<tr>
<td></td>
<td>Mrun syn</td>
</tr>
<tr>
<td></td>
<td>PP</td>
</tr>
<tr>
<td></td>
<td>SA</td>
</tr>
<tr>
<td></td>
<td>OPI</td>
</tr>
<tr>
<td></td>
<td>OEM</td>
</tr>
<tr>
<td></td>
<td>access rights</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td></td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
</tr>
<tr>
<td></td>
<td>block search</td>
</tr>
<tr>
<td></td>
<td>sink</td>
</tr>
<tr>
<td>Current value:</td>
<td>Not classified</td>
</tr>
</tbody>
</table>
### $VA\_DIST\_TORQUE[31]$

**Description:**
Normalized disturbing torque (disturbing torque/max. motor torque) = output signal of disturbance monitor in the drive - only available on PROFl drive drives with telegram 203

**Axis Identifier:**
- GEOAX
- CHANAX
- MACHAX
- SPINDLE

**Unit:**
- min.: -100
- max.: 100

**Access Rights:**
- run-in: X
- main run: X
- runin slp: X
- Mrun syn: X
- PP: X
- SA: X
- OPI: X
- OEM: X

**Current Value:**
Not classified

### $VA\_VALVELIFT[31]$

**Description:**
Actual valve lift in mm (for SIMODRIVE611D hydraulic module only)

**Axis Identifier:**
- GEOAX
- CHANAX
- MACHAX
- SPINDLE

**Unit:**
- min.: DBL_MIN
- max.: DBL_MAX

**Access Rights:**
- run-in: X
- main run: X
- runin slp: X
- Mrun syn: X
- PP: X
- SA: X
- OPI: X
- OEM: X

**Current Value:**
Not classified
### 1.25 Axial system variables

#### $VA\_PRESSURE\_A[X]$  
Pressure at A end of cylinder in bar (for SIMODRIVE611D hydraulic module only)

<table>
<thead>
<tr>
<th>Description</th>
<th>Axis identifier</th>
<th>NCK version</th>
<th>Unit</th>
<th>Min.:</th>
<th>Max.:</th>
<th>Run-in</th>
<th>Main run</th>
<th>Runin stp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description of field limits: to be defined</td>
<td>GEOAX</td>
<td>17.00.00</td>
<td>_</td>
<td>-</td>
<td>DBL_MAX</td>
<td>main run</td>
<td>runin stp</td>
<td>Mrun syn</td>
<td>PP</td>
<td>SA</td>
<td>OPI</td>
<td>OEM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attributes: global block search</td>
<td>read: X X X X</td>
<td>write: X X X X</td>
<td>Current value</td>
<td>Not classified</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### $VA\_PRESSURE\_B[X]$  
Pressure at B end of cylinder in bar (for SIMODRIVE611D hydraulic module only)

<table>
<thead>
<tr>
<th>Description</th>
<th>Axis identifier</th>
<th>NCK version</th>
<th>Unit</th>
<th>Min.:</th>
<th>Max.:</th>
<th>Run-in</th>
<th>Main run</th>
<th>Runin stp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description of field limits: to be defined</td>
<td>GEOAX, CHANAX, MACHAX, SPINDLE</td>
<td>17.00.00</td>
<td>_</td>
<td>-</td>
<td>DBL_MAX</td>
<td>main run</td>
<td>runin stp</td>
<td>Mrun syn</td>
<td>PP</td>
<td>SA</td>
<td>OPI</td>
<td>OEM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attributes: global block search</td>
<td>read: X X X X</td>
<td>write: X X X</td>
<td>Current value</td>
<td>Not classified</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### 1.25 Axial system variables

#### $VA_DP_ACT_TEL[20,31]$

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$VA_DP_ACT_TEL[b,a]$</td>
</tr>
<tr>
<td>b: Word index (16-bit access) in the PROFIBUS/PROFINET telegram</td>
</tr>
<tr>
<td>a: Machine axis</td>
</tr>
<tr>
<td>Actual value telegram contents - only available for PROFIBUS/PROFINET. For details, please see telegram configuration in PROFIdrive or drive documentation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Axis identifier:</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>MACHAX</th>
<th>SPINDLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCK version:</td>
<td>50.00.00</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Unit:</td>
<td>-</td>
<td>min.:</td>
<td>max.:</td>
<td>65535</td>
</tr>
<tr>
<td>Run-in</td>
<td>main run</td>
<td>runin stp</td>
<td>Mrun syn</td>
<td>PP</td>
</tr>
<tr>
<td>Read:</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Write:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attributes:</td>
<td>global</td>
<td>block search</td>
<td>link</td>
<td></td>
</tr>
<tr>
<td>Not classified</td>
<td>Not classified</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### $AA_STAT[31]$

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>The axial variable $AA_STAT[&lt;axis&gt;]$ determines the axis status. The status &quot;Exact stop fine&quot; is derived from the servo status. See also $AA_INPOS_STAT[&lt;axis&gt;]$. The following values are possible:</td>
</tr>
<tr>
<td>0: No axis status available</td>
</tr>
<tr>
<td>1: Traversing movement pending</td>
</tr>
<tr>
<td>2: Axis has reached IPO end</td>
</tr>
<tr>
<td>3: Axis in position (exact stop coarse)</td>
</tr>
<tr>
<td>4: Axis in position (exact stop fine)</td>
</tr>
<tr>
<td>Note:</td>
</tr>
<tr>
<td>With a position default setting for an axis / spindle, the variable can still indicate the statuses 'Exact stop coarse / fine' during block change although the axis / spindle is starting to traverse.</td>
</tr>
<tr>
<td>Remedy: Also query $AC_TIMEC$.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description of field limits:</th>
</tr>
</thead>
<tbody>
<tr>
<td>to be defined</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Axis identifier:</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>MACHAX</th>
<th>SPINDLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCK version:</td>
<td>06.00.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unit:</td>
<td>-</td>
<td>min.:</td>
<td>max.:</td>
<td>4</td>
</tr>
<tr>
<td>Run-in</td>
<td>main run</td>
<td>runin stp</td>
<td>Mrun syn</td>
<td>PP</td>
</tr>
<tr>
<td>Read:</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Write:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attributes:</td>
<td>global</td>
<td>block search</td>
<td>link</td>
<td></td>
</tr>
<tr>
<td>X</td>
<td>Not classified</td>
<td>Not classified</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### $AA_SNGLAX_STAT[31]

**description:** $AA_SNGLAX_STAT[X]

**Axis status:**
- 0: Axis is not a single axis
- 1: Single axis in Reset
- 2: Single axis has ended
- 3: Single axis is interrupted
- 4: Single axis is active
- 5: Single axis alarm is active

**description of field limits:**
To be defined

**axis identifier:**
- GEOAX
- CHANAX
- MACHAX
- SPINDLE

**unit:** -  **min.:**  **max.:** 4

<table>
<thead>
<tr>
<th>run-in</th>
<th>main run</th>
<th>runin stp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

**write:**
- attributes: global
- block search
- sink

**NCK version:** 48.00.00

### $AA_REF[31]

**description:** $AA_REF[X]

**Axis status:**
- 0: Axis is not homed
- 1: Axis is homed

**description of field limits:**
To be defined

**axis identifier:**
- GEOAX
- CHANAX
- MACHAX
- SPINDLE

**unit:** -  **min.:**  **max.:** 1

<table>
<thead>
<tr>
<th>run-in</th>
<th>main run</th>
<th>runin stp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

**write:**
- attributes: global
- block search
- sink

**X** Not classified

**NCK version:** 06.00.00

---

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SINUMERIK 840D sl/840Di sl/ 840D/ 840Di, List of System Variables (PGA1), 01/2008
### $AA_TYP[31]$

<table>
<thead>
<tr>
<th>Description:</th>
<th>Axis type:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$AA_TYP[&lt;axis&gt;]$</td>
<td>0: Axis in another channel</td>
</tr>
<tr>
<td></td>
<td>1: Program axis of own channel</td>
</tr>
<tr>
<td></td>
<td>2: Neutral axis</td>
</tr>
<tr>
<td></td>
<td>3: PLC axis</td>
</tr>
<tr>
<td></td>
<td>4: Oscillating axis</td>
</tr>
<tr>
<td></td>
<td>5: Neutral axis which is currently executing a JOG or homing motion</td>
</tr>
<tr>
<td></td>
<td>6: Following axis coupled via master value</td>
</tr>
<tr>
<td></td>
<td>7: Coupled motion following axis</td>
</tr>
<tr>
<td></td>
<td>8: Command axis</td>
</tr>
<tr>
<td></td>
<td>9: CompileCycles axis</td>
</tr>
<tr>
<td></td>
<td>10: Coupled slave axis (master-slave function)</td>
</tr>
<tr>
<td></td>
<td>11: Program axis which is currently executing a JOG or homing motion</td>
</tr>
</tbody>
</table>

#### Description of field limits:
- To be defined

<table>
<thead>
<tr>
<th>Axis identifier:</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>MACHAX</th>
<th>SPINDLE</th>
</tr>
</thead>
<tbody>
<tr>
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</table>

<table>
<thead>
<tr>
<th>Unit:</th>
<th>-</th>
<th>min.: 0</th>
<th>max.: 11</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>main run</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>runin stp</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mrun syn</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PP</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OPT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OEM</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>access rights</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>read</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>attributes</td>
<td>global</td>
<td>block search</td>
<td>link</td>
</tr>
<tr>
<td></td>
<td>Not classified</td>
<td>Not classified</td>
<td>Not classified</td>
</tr>
</tbody>
</table>

### $AA_MASL_STAT[31]$

<table>
<thead>
<tr>
<th>Description:</th>
<th>The current status of a master-slave coupling.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Val. 0:</td>
<td>Axis is not a slave axis or no coupling is active.</td>
</tr>
<tr>
<td>Value &gt; 0:</td>
<td>Coupling is active, the relevant machine axis number of the master axis is supplied.</td>
</tr>
</tbody>
</table>

#### Description of field limits:
- To be defined

<table>
<thead>
<tr>
<th>Axis identifier:</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>MACHAX</th>
<th>SPINDLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCK version:</td>
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<td>42.00.00</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit:</th>
<th>-</th>
<th>min.:</th>
<th>max.:</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>main run</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>runin stp</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mrun syn</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PP</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SA</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>OPT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OEM</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>access rights</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>read</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>write</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>attributes</td>
<td>global</td>
<td>block search</td>
<td>link</td>
</tr>
<tr>
<td></td>
<td>Not classified</td>
<td>Not classified</td>
<td>Not classified</td>
</tr>
</tbody>
</table>
### $P\_SEARCH\_MASLC[31]$ Description:
The current status of a master-slave coupling has been changed during a block search.

#### Field Limits Description:
- **Axis Identifier:** GEOAX, CHANAX, MACHAX, SPINDLE
- **NCK Version:** 43.00.00
- **Unit:** -
- **Min.:** 1
- **Max.:** 1
- **Attributes:** Global, Block Search, Link
- **Access Rights:** Not classified

<table>
<thead>
<tr>
<th>Run-in</th>
<th>Main Run</th>
<th>Runin SLP</th>
<th>Mrun Syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### $P\_SEARCH\_MASLD[31]$ Description:
Positional offset between master and slave axes calculated during block search as coupling was closed.

#### Field Limits Description:
- **Axis Identifier:** GEOAX, CHANAX, MACHAX, SPINDLE
- **NCK Version:** 43.00.00
- **Unit:** Linear / Angular Position
- **Min.:** DBL_MIN
- **Max.:** DBL_MAX
- **Attributes:** Global, Block Search, Link
- **Access Rights:** Not classified

<table>
<thead>
<tr>
<th>Run-in</th>
<th>Main Run</th>
<th>Runin SLP</th>
<th>Mrun Syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### $AA_FXS[31]$ System Variable

**Description:**

$AA_FXS[X]
Status desired state "Travel to fixed stop"
0: Axis not at limit stop
1: Fixed stop has been successfully approached
2: Approach to fixed stop has failed
3: Selection of travel to fixed stop active
4: Fixed stop has been detected
5: Deselection of travel to fixed stop active

**Field Limits:**

to be defined

**Axis Identifier:**

GEOAX
CHANAX
MACHAX
SPINDLE

**Unit:** _  |  min.: |  max.: |  5

**Run-in**  |  main run  |  runin stp  |  Mrun syn  |  PP  |  SA  |  OPT  |  OEM  |  access rights
read: X  |  X  |  X  |  |  |  |  |  |  |  X
write:  |  |  |  |  |  | X  |  |  |  X  

**Attributes:** global  |  block search  |  link
- Program sensitive  |  Not classified

### $VA_FXS[31]$ System Variable

**Description:**

$VA_FXS[X]
Status actual state "Travel to fixed stop"
0: Axis not at limit stop
1: Fixed stop has been successfully approached
2: Approach to fixed stop has failed
3: Selection of travel to fixed stop active
4: Fixed stop has been detected
5: Deselection of travel to fixed stop active

**Field Limits:**

to be defined

**Axis Identifier:**

GEOAX
CHANAX
MACHAX
SPINDLE

**Unit:** _  |  min.: |  max.: |  5

**Run-in**  |  main run  |  runin stp  |  Mrun syn  |  PP  |  SA  |  OPT  |  OEM  |  access rights
read: X  |  X  |  X  |  |  |  |  |  |  |  X
write:  |  |  |  |  |  | X  |  |  |  X 

**Attributes:** global  |  block search  |  link
- Program sensitive  |  Not classified
### $VA\_FXS\_INFO[31]$

<table>
<thead>
<tr>
<th>Description:</th>
<th>Additional information with &quot;Travel to fixed stop&quot; if $VA_FXS[i]=2</th>
</tr>
</thead>
<tbody>
<tr>
<td>0:</td>
<td>No additional information available</td>
</tr>
<tr>
<td>1:</td>
<td>No approach movement programmed</td>
</tr>
<tr>
<td>2:</td>
<td>Programmed end position reached, motion completed</td>
</tr>
<tr>
<td>3:</td>
<td>Abort by NC RESET (key reset)</td>
</tr>
<tr>
<td>4:</td>
<td>Axis has exited fixed stop window</td>
</tr>
<tr>
<td>5:</td>
<td>Torque reduction rejected by drive</td>
</tr>
<tr>
<td>6:</td>
<td>PLC has cancelled enables</td>
</tr>
</tbody>
</table>

**Description of field limits:**
- To be defined

<table>
<thead>
<tr>
<th>Axis identifier:</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOAX</td>
</tr>
<tr>
<td>CHANAX</td>
</tr>
<tr>
<td>MACHAX</td>
</tr>
<tr>
<td>SPINDLE</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit:</th>
<th>min.:</th>
<th>max.:</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>main run</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>runin stp</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Mrun syn</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>PP</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>SA</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>OPI</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>OEM</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>access rights</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

**Read:** XXX XXX

**Write:**

**Attributes:**
- Global
- Block search
- Link
- Not classified

### $VA\_TORQUE\_AT\_LIMIT[31]$

<table>
<thead>
<tr>
<th>Description:</th>
<th>&quot;Torque limit reached&quot; status</th>
</tr>
</thead>
<tbody>
<tr>
<td>0: Torque limit not yet reached</td>
<td>1: Torque limit reached</td>
</tr>
</tbody>
</table>

In digital SIMODRIVE611D systems, the drive returns a status signal indicating whether the programmed torque limit has been reached.

**Description of field limits:**
- To be defined

<table>
<thead>
<tr>
<th>Axis identifier:</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOAX</td>
</tr>
<tr>
<td>CHANAX</td>
</tr>
<tr>
<td>MACHAX</td>
</tr>
<tr>
<td>SPINDLE</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit:</th>
<th>min.:</th>
<th>max.:</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>main run</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>runin stp</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Mrun syn</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>PP</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>SA</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>OPI</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>OEM</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>access rights</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

**Read:** XXX XXX X

**Write:**

**Attributes:**
- Global
- Block search
- Link
- Not classified

**Not classified**

---

© Siemens AG 2008 All Rights Reserved
SINUMERIK 840D sl/840Di sl/ 840D/ 840Di, List of System Variables (PGA1), 01/2008
### INT 
**$AA_FOC[31]$**

<table>
<thead>
<tr>
<th>Description:</th>
<th>$AA_FOC[X]$ Status desired state &quot;ForceControl&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0: ForceControl not active</td>
</tr>
<tr>
<td></td>
<td>1: ForceControl active modally</td>
</tr>
<tr>
<td></td>
<td>2: ForceControl active non-modally</td>
</tr>
</tbody>
</table>

**Description of field limits:**

To be defined

<table>
<thead>
<tr>
<th>Axis identifier:</th>
<th>NCK version:</th>
</tr>
</thead>
<tbody>
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<td>20.00.00</td>
</tr>
<tr>
<td>CHANAX</td>
<td></td>
</tr>
<tr>
<td>MACHAX</td>
<td></td>
</tr>
<tr>
<td>SPINDLE</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit:</th>
<th>Min.</th>
<th>Max.</th>
<th>Run-in</th>
<th>Main Run</th>
<th>Runin Stop</th>
<th>Mrun Syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>read: XXX XXXX</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td>write: XXX XXXX</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>attributes: Not classified</td>
</tr>
</tbody>
</table>

### INT 
**$VA_FOC[31]$**

<table>
<thead>
<tr>
<th>Description:</th>
<th>$VA_FOC[X]$ Status actual state &quot;ForceControl&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0: ForceControl not active</td>
</tr>
<tr>
<td></td>
<td>1: ForceControl active modally</td>
</tr>
<tr>
<td></td>
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</tr>
</tbody>
</table>

**Description of field limits:**

To be defined

<table>
<thead>
<tr>
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<th>NCK version:</th>
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<tbody>
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<tr>
<td>CHANAX</td>
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</tr>
<tr>
<td>MACHAX</td>
<td></td>
</tr>
<tr>
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<td></td>
</tr>
</tbody>
</table>

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<tr>
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<th>Min.</th>
<th>Max.</th>
<th>Run-in</th>
<th>Main Run</th>
<th>Runin Stop</th>
<th>Mrun Syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>read: XXX XXXX</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>write: XXX XXXX</td>
</tr>
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<td></td>
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<td>attributes: Not classified</td>
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</table>

Not classified
### 1.25 Axial system variables

<table>
<thead>
<tr>
<th>$\text{AA_COUP_ACT}[31]$</th>
<th>description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\text{AA_COUP_ACT}[C]$</td>
<td>C: following axis C or S2: following spindle 2</td>
</tr>
<tr>
<td>It is possible to determine whether an axis / spindle is being used by a coupling. The coupling type is returned when the coupling is active. The system variable must be read out for the following axis / spindle.</td>
<td></td>
</tr>
<tr>
<td>Values:</td>
<td></td>
</tr>
<tr>
<td>0: Axis / spindle is not coupled with a leading spindle / leading axis</td>
<td></td>
</tr>
<tr>
<td>1, 2, 3: Axis is tangentially tracked (TANG)</td>
<td></td>
</tr>
<tr>
<td>4: Synchronous spindle coupling (COUP)</td>
<td></td>
</tr>
<tr>
<td>8: Axis is in coupled-motion (TRAIL)</td>
<td></td>
</tr>
<tr>
<td>16: Following axis in master value coupling (LEAD)</td>
<td></td>
</tr>
<tr>
<td>32: Following axis for electronic gear (ELG)</td>
<td></td>
</tr>
<tr>
<td>64: Axis is active in a gantry grouping</td>
<td></td>
</tr>
<tr>
<td>128, 256, 384: Axis is tangentially tracked (TANG with optimization)</td>
<td></td>
</tr>
<tr>
<td>512: Following axis of the generic coupling (CP)</td>
<td></td>
</tr>
<tr>
<td>If the axis / spindle is a following axis / spindle in several couplings, the sum is returned as the value.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>$\text{AA_EG_SYNFA}[31]$</th>
<th>description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\text{AA_EG_SYNFA}[a]$</td>
<td>a: Following axis</td>
</tr>
<tr>
<td>Synchronous position of following axis</td>
<td></td>
</tr>
</tbody>
</table>

### INT

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<thead>
<tr>
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<tr>
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</thead>
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<tr>
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</tr>
<tr>
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</table>

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<td></td>
</tr>
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<td></td>
</tr>
</tbody>
</table>
1 System variable

1.25 Axial system variables

---

<table>
<thead>
<tr>
<th>STRING</th>
<th>$P_EG_BC[31]</th>
<th>description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$P_EG_BC[a]</td>
<td>Block change criterion for EGONSYN, EGON, WAITC.</td>
<td></td>
</tr>
<tr>
<td>description of field limits:</td>
<td>to be defined</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>SPINDLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCK version:</td>
<td>16.00.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>unit:</td>
<td>-</td>
<td>min.:</td>
<td>max.:</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin slp</td>
<td>Mrun syn</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
<td>link</td>
</tr>
<tr>
<td></td>
<td>Not classified</td>
<td>Not classified</td>
<td></td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>INT</th>
<th>$AA_EG_NUM_LA[31]</th>
<th>description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$AA_EG_NUM_LA[a]</td>
<td>Number of leading axes specified with EGDEF</td>
<td></td>
</tr>
<tr>
<td>a: Following axis</td>
<td>Number of leading axes specified with EGDEF</td>
<td></td>
</tr>
<tr>
<td>description of field limits:</td>
<td>to be defined</td>
<td></td>
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<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>MACHAX</th>
<th>SPINDLE</th>
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<tbody>
<tr>
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<td></td>
<td></td>
</tr>
<tr>
<td>unit:</td>
<td>-</td>
<td>min.:</td>
<td>max.:</td>
<td></td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin slp</td>
<td>Mrun syn</td>
<td>PP</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
<td>link</td>
<td></td>
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<tr>
<td></td>
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### DOUBLE $VA_EG_SYNCDIFF[31]

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$VA_EG_SYNCDIFF[a]</td>
</tr>
<tr>
<td>a: Following axis</td>
</tr>
<tr>
<td>Synchronism deviation</td>
</tr>
<tr>
<td>Description of field limits:</td>
</tr>
<tr>
<td>to be defined</td>
</tr>
<tr>
<td>Axis identifier:</td>
</tr>
<tr>
<td>GEOAX</td>
</tr>
<tr>
<td>CHANAX</td>
</tr>
<tr>
<td>MACHAX</td>
</tr>
<tr>
<td>SPINDLE</td>
</tr>
<tr>
<td>NCK version:</td>
</tr>
<tr>
<td>16.00.00</td>
</tr>
<tr>
<td>Unit:</td>
</tr>
<tr>
<td>Linear / angular position</td>
</tr>
<tr>
<td>min.: DBL_MIN</td>
</tr>
<tr>
<td>max.: DBL_MAX</td>
</tr>
<tr>
<td>Run-in:</td>
</tr>
<tr>
<td>main run</td>
</tr>
<tr>
<td>runin slp</td>
</tr>
<tr>
<td>Mrun syn</td>
</tr>
<tr>
<td>PP</td>
</tr>
<tr>
<td>SA</td>
</tr>
<tr>
<td>OPI</td>
</tr>
<tr>
<td>OEM</td>
</tr>
<tr>
<td>Access rights:</td>
</tr>
<tr>
<td>read:</td>
</tr>
<tr>
<td>X</td>
</tr>
<tr>
<td>X</td>
</tr>
<tr>
<td>X</td>
</tr>
<tr>
<td>X</td>
</tr>
<tr>
<td>write:</td>
</tr>
<tr>
<td>X</td>
</tr>
<tr>
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<tr>
<td>attributes:</td>
</tr>
<tr>
<td>global</td>
</tr>
<tr>
<td>block search</td>
</tr>
<tr>
<td>sink</td>
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<tr>
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</table>

### DOUBLE $VA_EG_SYNCDIFF_S[31]

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$VA_EG_SYNCDIFF_S[a]</td>
</tr>
<tr>
<td>a: Following axis</td>
</tr>
<tr>
<td>Signed synchronism deviation</td>
</tr>
<tr>
<td>Description of field limits:</td>
</tr>
<tr>
<td>to be defined</td>
</tr>
<tr>
<td>Axis identifier:</td>
</tr>
<tr>
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<tr>
<td>CHANAX</td>
</tr>
<tr>
<td>MACHAX</td>
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<tr>
<td>SPINDLE</td>
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<tr>
<td>Unit:</td>
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<tr>
<td>Linear / angular position</td>
</tr>
<tr>
<td>min.: -DBL_MAX</td>
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<tr>
<td>max.: DBL_MAX</td>
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<tr>
<td>Run-in:</td>
</tr>
<tr>
<td>main run</td>
</tr>
<tr>
<td>runin slp</td>
</tr>
<tr>
<td>Mrun syn</td>
</tr>
<tr>
<td>PP</td>
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<tr>
<td>SA</td>
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<tr>
<td>OPI</td>
</tr>
<tr>
<td>OEM</td>
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<td>write:</td>
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<td>block search</td>
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<tr>
<td>sink</td>
</tr>
<tr>
<td>Not classified</td>
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</tbody>
</table>
### AX Isis $\text{AA_EG_AX}[31,31]$

**Description:**

$\text{AA_EG_AX}[n,a]$

- **n:** Index for leading axis
- **a:** Following axis

**Identifier for the nth leading axis**

**Description of field limits:**

- **n:** Index for leading axis (nth leading axis) to be defined

<table>
<thead>
<tr>
<th>Axis identifier:</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>MACHAX</th>
<th>SPINDLE</th>
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<td>Unit:</td>
<td>Linear</td>
<td>Angular position</td>
<td></td>
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<tr>
<td>Min.:</td>
<td>DBL_MIN</td>
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<td></td>
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</tr>
<tr>
<td>Max.:</td>
<td>DBL_MAX</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Run-in:</td>
<td>Main run</td>
<td>Runin stp</td>
<td>Mrun syn</td>
<td>PP</td>
</tr>
<tr>
<td>Read:</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Write:</td>
<td>X</td>
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<td>Attributes:</td>
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### DOUBLE $\text{AA_LEAD_SP}[31]$

**Description:**

$\text{AA_LEAD_SP}[LW]$

Simulated master value position

**Description of field limits:**

- to be defined

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<th>Axis identifier:</th>
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<th>CHANAX</th>
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<td>Unit:</td>
<td>Linear</td>
<td>Angular position</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min.:</td>
<td>DBL_MIN</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max.:</td>
<td>DBL_MAX</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Run-in:</td>
<td>Main run</td>
<td>Runin stp</td>
<td>Mrun syn</td>
<td>PP</td>
</tr>
<tr>
<td>Read:</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Write:</td>
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</tbody>
</table>
### 1.25 Axial system variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>$AA_LEAD_SV[31]$</td>
<td>Simulated master value velocity</td>
</tr>
</tbody>
</table>

**Axis identifier:**
- GEOAX
- CHANAX
- MACHAX
- SPINDLE

**NCK version:** 13.00.00

**Unit:**
- Linear
- Angular speed

<table>
<thead>
<tr>
<th>Run-in</th>
<th>Main run</th>
<th>Runin stp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>Access rights</th>
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<tbody>
<tr>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>7</td>
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</tbody>
</table>

**Read:**
- $X$

**Write:**
- $X$

**Attributes:**
- Global
- Block search
- Link

- Not classified

---

DOUBLE

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SINUMERIK 840D sl/840Di sl/ 840D/ 840Di, List of System Variables (PGA1), 01/2008

1-501
DOUBLE $AA_LEAD_P_TURN[31]$

description:

$AA_LEAD_P_TURN[LW]$

Current master value positional component lost as a result of modulo reduction.
The actual master value position (used internally by the control) is $AA_LEAD_P[LW] + $AA_LEAD_P_TURN[LW].
If LW is a modulo axis, $AA_LEAD_P_TURN is an integral multiple of $MA_MODULO_RANGE.
If LW is not a modulo axis, $AA_LEAD_P_TURN is always 0.

Example 1:

$MA_MODULO_RANGE[LW]=360$
$AA_LEAD_P[LW] =290$
$AA_LEAD_P_TURN[LW] =720$
The actual master value position (used internally by the control) is 1010.

Example 2:

$MA_MODULO_RANGE[LW]=360$
$AA_LEAD_P[LW] =290$
$AA_LEAD_P_TURN[LW] =-360$
The actual master value position (used internally by the control) is -70.

description of field limits:

to be defined

axis identifier: GEOAX CHANAX MACHAX SPINDLE

NCK version: 13.00.00

unit: linear / angular position

min.: DBL_MIN max.: DBL_MAX

run-in main run runin stp Mrun syn PP SA OPI OEM access rights

read: X X X X X X

write: 

attributes: global block search sink

Not classified Not classified
### 1.25 Axial system variables

**$AA\_LEAD\_P[31]$**

**Description:**
Current master value position (modulo-reduced)

If LW is a modulo axis, the following always applies:

\[ 0 \leq AA\_LEAD\_P[LW] \leq MA\_MODULO\_RANGE[LW] \]

**Field limits:**

<table>
<thead>
<tr>
<th>Axis identifier</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>MACHAX</th>
<th>SPINDLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCK version</td>
<td>13.00.00</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Unit:**
Linear / angular position

**Min.:** DBL_MIN
**Max.:** DBL_MAX

**Read/Write Attributes:**
- Global
- Block search
- Link

**Access Rights:**
- Not classified

---

**$AA\_LEAD\_V[31]$**

**Description:**
Current master value velocity

**Field limits:**

<table>
<thead>
<tr>
<th>Axis identifier</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>MACHAX</th>
<th>SPINDLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCK version</td>
<td>13.00.00</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Unit:**
Linear / angular speed

**Min.:** DBL_MIN
**Max.:** DBL_MAX

**Read/Write Attributes:**
- Global
- Block search
- Link

**Access Rights:**
- Not classified
<table>
<thead>
<tr>
<th>INT</th>
<th>$AA_SYNC[31]$</th>
<th>description:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$AA_SYNC[FA]$</td>
<td>Coupling status of following axis</td>
</tr>
<tr>
<td></td>
<td>0 =&gt; No synchronism</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 =&gt; Coarse synchronism</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 =&gt; Fine synchronism</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 =&gt; Coarse and fine synchronism</td>
<td></td>
</tr>
<tr>
<td></td>
<td>description of field limits:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>to be defined</td>
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<td>axis identifier:</td>
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<td></td>
</tr>
<tr>
<td>max.:</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>run-in</td>
<td>read: X</td>
<td></td>
</tr>
<tr>
<td>main run</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>runin slp</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Mrun syn</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>PP</td>
<td>read: X</td>
<td></td>
</tr>
<tr>
<td>SA</td>
<td>X</td>
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<td>OPI</td>
<td>X</td>
<td></td>
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<tr>
<td>OEM</td>
<td>X</td>
<td></td>
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<tr>
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<td></td>
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<td></td>
<td>write: XXXX</td>
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<tr>
<th>INT</th>
<th>$AA_IN_SYNC[31]$</th>
<th>description:</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>$AA_IN_SYNC[FA]$</td>
<td>Synchronization status of the following axis with master value coupling, ELG and generic coupling</td>
</tr>
<tr>
<td></td>
<td>1 =&gt; Synchronization in progress, i.e. following axis is being synchronized</td>
<td></td>
</tr>
<tr>
<td></td>
<td>description of field limits:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>to be defined</td>
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<td></td>
<td>SPINDLE</td>
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</tr>
<tr>
<td>unit:</td>
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<td>min.:</td>
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<td>max.:</td>
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<tr>
<td>run-in</td>
<td>read: X</td>
<td></td>
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<tr>
<td>main run</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>runin slp</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Mrun syn</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>PP</td>
<td>read: X</td>
<td></td>
</tr>
<tr>
<td>SA</td>
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<td>OPI</td>
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<td>access rights:</td>
<td>read: XXX</td>
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</tr>
<tr>
<td></td>
<td>write: XXXX</td>
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<td>attributes:</td>
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<td>search</td>
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<tr>
<td>NCK version:</td>
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</table>
### $P\_COUP\_OFFS[31]$

**Description:**

Programmed position offset from synchronous spindle (following spindle) to leading spindle

**Axis Identifier:**

- GEOAX
- CHANAX
- MACHAX
- SPINDLE

**Unit:** Linear / Angular position

**Field Limits:**

- Minimum: DBL_MIN
- Maximum: DBL_MAX

**Access Rights:**

- Run-in: X
- Main run: X
- Runin slop: X
- Mrun syn: X
- PP: X
- SA: X
- OPI: X
- OEM: X

**Attributes:**

- Global: X
- Block search: X
- Link: X

**NCK Version:** 46.00.00

---

### $AA\_COUP\_OFFS[31]$

**Description:**

Position offset from synchronous spindle (following spindle) to leading spindle on setpoint side

**Axis Identifier:**

- GEOAX
- CHANAX
- MACHAX
- SPINDLE

**Unit:** Linear / Angular position

**Field Limits:**

- Minimum: DBL_MIN
- Maximum: DBL_MAX

**Access Rights:**

- Run-in: X
- Main run: X
- Runin slop: X
- Mrun syn: X
- PP: X
- SA: X
- OPI: X
- OEM: X

**Attributes:**

- Global: X
- Block search: X
- Link: X

**NCK Version:** 06.00.00

---

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SINUMERIK 840D sl/840Di sl/ 840D/ 840Di, List of System Variables (PGA1), 01/2008
### $VA_COUP_OFFS[31]

**Description:**
Position offset from synchronous spindle (following spindle) to leading spindle on actual value side.

<table>
<thead>
<tr>
<th>Field Limits</th>
<th>Axis Identifier</th>
<th>Unit</th>
<th>Min.</th>
<th>Max.</th>
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<tbody>
<tr>
<td></td>
<td>GEOAX CHANAX MACHAX SPINDLE</td>
<td>DBL_MIN</td>
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**Access Rights:**
- Read: XXX XXXX
- Write: XXX XX X

**Attributes:**
- Global
- Block search
- Link

### $AA_SCTRACE[X]

**Description:**
Write: Activate IPO trigger for servo trace
0: No action
!0: Activate trigger
Read: Always 0 because trigger cannot be read back.

<table>
<thead>
<tr>
<th>Field Limits</th>
<th>Axis Identifier</th>
<th>Unit</th>
<th>Min.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>GEOAX CHANAX MACHAX SPINDLE</td>
<td>-</td>
<td>FALSE</td>
<td>TRUE</td>
</tr>
</tbody>
</table>

**Access Rights:**
- Read: X X X
- Write: X X X

**Attributes:**
- Global
- Block search
- Link

Not classified

---

1 System variable 01/2008
1.25 Axial system variables

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SINUMERIK 840D sl/840Di sl/ 840D/ 840Di, List of System Variables (PGA1), 01/2008
### 1.25 Axial system variables

#### $VA_DPE[31]$

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Status of power enable for a machine axis (status of the axial pulse enable).</td>
</tr>
<tr>
<td>For SIMODRIVE 611D: The status is supplied directly from the drive.</td>
</tr>
<tr>
<td>For PROFIdrive drives with a telegram type greater than 100: The status comes directly from the drive (message word, bit5)</td>
</tr>
<tr>
<td>For other PROFIdrive drives: The status is modeled from further drive status signals (identical to $VA_SCE$, see there)</td>
</tr>
</tbody>
</table>

**Description of field limits:**

- To be defined

<table>
<thead>
<tr>
<th>Axis identifier:</th>
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<tbody>
<tr>
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<td>SPINDLE</td>
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<table>
<thead>
<tr>
<th>Unit:</th>
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<tbody>
<tr>
<td>Linear / Angular acceleration</td>
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</tbody>
</table>

<table>
<thead>
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<th>Read:</th>
</tr>
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<tbody>
<tr>
<td>X</td>
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<td>X</td>
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<tr>
<td>X</td>
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<table>
<thead>
<tr>
<th>Write:</th>
</tr>
</thead>
<tbody>
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<td>X</td>
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<tr>
<td>X</td>
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<tr>
<td>X</td>
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<table>
<thead>
<tr>
<th>Attributes:</th>
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<tbody>
<tr>
<td>Global</td>
</tr>
<tr>
<td>Block search</td>
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</table>

| Not classified |

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#### $AA_ACC[31]$

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current acceleration value of axis with single-axis interpolation.</td>
</tr>
<tr>
<td>$AA_ACC = $MA_MAX_AX_ACCEL * progr. acceleration override.</td>
</tr>
</tbody>
</table>

**Description of field limits:**

- To be defined

<table>
<thead>
<tr>
<th>Axis identifier:</th>
</tr>
</thead>
<tbody>
<tr>
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</tr>
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<td>CHANAX</td>
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<tr>
<td>MACHAX</td>
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<td>SPINDLE</td>
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<tbody>
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<table>
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<tbody>
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<tr>
<td>Block search</td>
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| Not classified |

### $AA\_ACC\_PERCENT[31]$ (31)

**Description:**
Variable $AA\_ACC\_PERCENT$ supplies the current acceleration value of the axis for single-axis interpolation in percent.

**Description of Field Limits:**
to be defined

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>NCK version:</th>
<th>INT_MIN</th>
<th>INT_MAX</th>
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<tbody>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin slp</td>
<td>Mrun syn</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
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<td></td>
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### $PA\_ACCLIMA[31]$ (31)

**Description:**
$PA\_ACCLIMA$
Acceleration override set with ACCLIMA in preprocessing run

**Description of Field Limits:**
to be defined

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<th>INT_MAX</th>
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<td>MACHAX</td>
<td>SPINDLE</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin slp</td>
<td>Mrun syn</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
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| attributes: | global | block search | link | |
|-------------|--------|---------------|------|
| access rights | Not classified | Not classified | Not classified |
### $PA_VELOLIMA[31]

**Description:**

$PA_VELOLIMA

Velocity override set with VELOLIMA in preprocessing run

**Description of Field Limits:**

to be defined

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</tr>
<tr>
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<td></td>
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</tr>
<tr>
<td>Run-in</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Main Run</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Run-in stop</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mrun Syn</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PP</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SA</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OPI</td>
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<td>Access Rights</td>
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<td>X</td>
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<td>Write</td>
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<td>Not classified</td>
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### $PA_JERKLIMA[31]

**Description:**

$PA_JERKLIMA

Jerk override set with JERKLIMA in preprocessing run

**Description of Field Limits:**

to be defined

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<thead>
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<tbody>
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</tr>
<tr>
<td>Run-in</td>
<td>X</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Main Run</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Run-in stop</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mrun Syn</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PP</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SA</td>
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<td></td>
</tr>
<tr>
<td>OPI</td>
<td>X</td>
<td></td>
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<tr>
<td>Read</td>
<td>X</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Write</td>
<td></td>
<td></td>
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**1.25 Axial system variables**

<table>
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<th>Description:</th>
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</thead>
<tbody>
<tr>
<td><strong>$AA_ACCLIMA[31]</strong></td>
<td>Acceleration override set with ACCLIMA in main run</td>
</tr>
</tbody>
</table>

**Description of field limits:**
- To be defined

**Identifier:**
- GEOAX
- CHANAX
- MACHAX
- SPINDLE

**NCK version:**
- 50.00.00

**Unit:**
- 

**Min.:**
- 1

**Max.:**
- 200

**Run-in main run runin stp Mrun syn PP SA OPI OEM access rights:**

**Read:**
- X
- X
- X
- X
- X
- X

**Write:**
- Global block search

**Attributes:**
- Not classified

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<table>
<thead>
<tr>
<th>INT</th>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>$AA_VELOLIMA[31]</strong></td>
<td>Velocity override set with VELOLIMA in main run</td>
</tr>
</tbody>
</table>

**Description of field limits:**
- To be defined

**Identifier:**
- GEOAX
- CHANAX
- MACHAX
- SPINDLE

**NCK version:**
- 50.00.00

**Unit:**
- 

**Min.:**
- 1

**Max.:**
- 200

**Run-in main run runin stp Mrun syn PP SA OPI OEM access rights:**

**Read:**
- X
- X
- X
- X
- X
- X

**Write:**
- Global block search

**Attributes:**
- Not classified
### $AA\_JERKLIMA[31]$

**Description:**

Jerk override set with JERKLIMA in main run

**Fields Limits:**

to be defined

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<th>GEOAX</th>
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**Unit:**

- min.: 1
- max.: 200

**Run-In:**

<table>
<thead>
<tr>
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<th>main run</th>
<th>runin stp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

**Attributes:**

- global
- block search
- snk

**Access Rights:**

- Not classified
- Not classified

---

### $AA\_MOTEND[31]$

**Description:**

Current end of motion criterion with single-axis interpolation

- 1 = End of motion with exact stop FINE
- 2 = End of motion with exact stop COARSE
- 3 = End of motion at end of interpolation
- 4 = Block change in braking ramp of axis motion
- 5 = Block change in braking ramp of axis motion with tolerance window for setpoint
- 6 = Block change in braking ramp of axis motion with tolerance window for actual value

**Fields Limits:**

to be defined

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>MACHAX</th>
<th>SPINDLE</th>
</tr>
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</table>

**Unit:**

- min.: 1
- max.: 6

**Run-In:**

<table>
<thead>
<tr>
<th>run-in</th>
<th>main run</th>
<th>runin stp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td></td>
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**Attributes:**

- global
- block search
- snk

**Access Rights:**

- Not classified
- Not classified
### $AA_SCPAR[31]

**Description:**
Current setpoint parameter set

**Axis Identifier:**
- GEOAX
- CHANAX
- MACHAX
- SPINDLE

**Unit:** INT

**Field Limits:**
- **Min.:** INT_MIN
- **Max.:** INT_MAX

**Access Rights:**
- Read: X X X X X X
- Write: 

**Attributes:**
- Global
- Block search
- Link

### $AA_ESR_STAT[X]

**Description:**
Status of "Extended stop and retract", bit-coded:
- BIT0: Generator mode is activated
- BIT1: Retraction is activated
- BIT2: Extended stop is activated
- BIT3: DC-link undervoltage
- BIT4: Generator minimum speed

**Axis Identifier:**
- GEOAX
- CHANAX
- MACHAX
- SPINDLE

**Unit:** -

**Field Limits:**
- **Min.:** -
- **Max.:** 15

**Access Rights:**
- Read: X X X X X X
- Write: 

**Attributes:**
- Global
- Block search
- Link

Not classified
### $\text{BOOL } $\text{AA_ESR_ENABLE}[31]$

<table>
<thead>
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<th>Description:</th>
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<tbody>
<tr>
<td>$\text{AA_ESR_ENABLE}[X] = 1$</td>
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<tr>
<td>Enabling of &quot;Extended stop and retract&quot;</td>
</tr>
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</table>

to be defined

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>GEOAX</td>
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<td>CHANAX</td>
</tr>
<tr>
<td>MACHAX</td>
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<tr>
<td>SPINDLE</td>
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<table>
<thead>
<tr>
<th>Unit:</th>
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<table>
<thead>
<tr>
<th>Min.:</th>
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<table>
<thead>
<tr>
<th>Max.:</th>
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<tbody>
<tr>
<td>TRUE</td>
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<table>
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<tr>
<td>write: XXX XX X7</td>
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### $\text{BOOL } $\text{AA_ESR_TRIGGER}[31]$

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<tr>
<td>$\text{AA_ESR_TRIGGER}[X] = 1$</td>
</tr>
<tr>
<td>Activation of &quot;NC-controlled ESR&quot; for PLC-controlled axis (= single axis)</td>
</tr>
<tr>
<td>X: PLC-controlled axis</td>
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</table>

to be defined

<table>
<thead>
<tr>
<th>Axis identifier:</th>
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<tbody>
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<table>
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<tr>
<th>Min.:</th>
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<thead>
<tr>
<th>Max.:</th>
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<tbody>
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<table>
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<tr>
<td>write: XX X 7</td>
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### $\text{DOUBLE } $AA\_POLFA[31] Description:

$\text{DOUBLE } $AA\_POLFA[X]

X: PLC-controlled axis (= single axis)

Supplies the programmed retraction position of the PLC-controlled axis

<table>
<thead>
<tr>
<th>Description</th>
<th>$AA_POLFA[31]$</th>
<th>$AA_POLFA[X]$</th>
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<tbody>
<tr>
<td>X: PLC-controlled axis (= single axis)</td>
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<tr>
<td>Supplies the programmed retraction position of the PLC-controlled axis</td>
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#### Description of Field Limits

to be defined

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<tr>
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<tr>
<td>Run-in</td>
<td>main run</td>
<td>runin slp</td>
<td>Mrun syn</td>
<td>PP</td>
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<td>X</td>
<td>X</td>
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### INT $\text{INT } $AA\_POLFA\_VALID[31] Description:

$\text{INT } $AA\_POLFA\_VALID[X]

Supplies the current status of $AA\_POLFA[X]

X: PLC-controlled axis (= single axis)

Return values:

0: Retraction not programmed
1: Retraction programmed as position
2: Retraction programmed as distance

<table>
<thead>
<tr>
<th>Description</th>
<th>$AA_POLFA_VALID[31]$</th>
<th>$AA_POLFA_VALID[X]$</th>
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<tr>
<td>X: PLC-controlled axis (= single axis)</td>
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<td>Supplies the current status of $AA_POLFA[X]</td>
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#### Description of Field Limits

to be defined

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<td>runin slp</td>
<td>Mrun syn</td>
<td>PP</td>
</tr>
<tr>
<td>Read</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Write</td>
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</tr>
<tr>
<td>Attributes</td>
<td>global</td>
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### INT $AA_ALARM_STAT[31]

<table>
<thead>
<tr>
<th>Description:</th>
<th>$AA_ALARM_STAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Displays whether there are alarms present for a PLC-controlled axis.</td>
<td></td>
</tr>
<tr>
<td>The coded, associated alarm responses can be used as a source for the &quot;Extended stop and retract&quot;.</td>
<td></td>
</tr>
<tr>
<td>The data is bit-coded so that, if necessary, individual states can also be masked or evaluated separately (bits not listed below supply a value of 0)</td>
<td></td>
</tr>
<tr>
<td>Bit2 = 1: NOREADY (active rapid deceleration + cancellation of servo enable)</td>
<td></td>
</tr>
<tr>
<td>Bit6 = 1: STOPBYALARM (ramp stop of all channel axes)</td>
<td></td>
</tr>
<tr>
<td>Bit9 = 1: SETVDI (VDI interface signal alarm is set)</td>
<td></td>
</tr>
<tr>
<td>Bit13 = 1: FOLLOWUPBYALARM (follow-up)</td>
<td></td>
</tr>
</tbody>
</table>

| Description of field limits: |
| to be defined |

<table>
<thead>
<tr>
<th>Axis identifier:</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>MACHAX</th>
<th>SPINDLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit:</td>
<td>INT_MIN</td>
<td>INT_MAX</td>
<td></td>
<td></td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin slp</td>
<td>Mrun syn</td>
<td>PP</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attributes:</td>
<td>global</td>
<td>block search</td>
<td>link</td>
<td>Not classified</td>
</tr>
</tbody>
</table>

### BOOL $AN_AXCTSWA[31]

<table>
<thead>
<tr>
<th>Description:</th>
<th>Is axis container rotation active?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Example: EVERY $AN_AXCTSWA[n] == TRUE DO M99</td>
<td></td>
</tr>
<tr>
<td>Read: TRUE: An axis container rotation is currently being executed on the axis container with axis container name n</td>
<td></td>
</tr>
<tr>
<td>FALSE: Axis container rotation is not active.</td>
<td></td>
</tr>
</tbody>
</table>

| Description of field limits: |
| to be defined |

<table>
<thead>
<tr>
<th>Axis identifier:</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>MACHAX</th>
<th>SPINDLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit:</td>
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<td>TRUE</td>
<td></td>
<td></td>
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<tr>
<td>run-in</td>
<td>main run</td>
<td>runin slp</td>
<td>Mrun syn</td>
<td>PP</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td></td>
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<tr>
<td>Attributes:</td>
<td>global</td>
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</table>
## 1.25 Axial system variables

### INT $\text{SAN\_AXCTAS}[31]$

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<th>MACHAX</th>
<th>SPINDLE</th>
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<td>max.:</td>
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</tr>
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<td>X</td>
<td>X</td>
<td>run-in</td>
<td>main run</td>
<td></td>
</tr>
<tr>
<td>main run</td>
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<td></td>
<td></td>
<td>run-in</td>
<td>run-in std</td>
<td></td>
</tr>
<tr>
<td>run-in std</td>
<td></td>
<td></td>
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<td>run-in</td>
<td>Mrun syn</td>
<td></td>
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<tr>
<td>Mrun syn</td>
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<td>run-in</td>
<td>PP</td>
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<td>run-in</td>
<td>SA</td>
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<td>run-in</td>
<td>OEM</td>
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<td>SA</td>
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<td></td>
<td>run-in</td>
<td>OEM</td>
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<td>OEM</td>
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<td>access</td>
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<td>run-in</td>
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<td>X</td>
<td>run-in</td>
<td>X</td>
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</tr>
<tr>
<td>write:</td>
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<td></td>
<td>X</td>
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<tr>
<td>attributes:</td>
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### BOOL $\text{SAC\_AXCTSWA}[31]$

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<th>MACHAX</th>
<th>SPINDLE</th>
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<tbody>
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<td>FALSE</td>
<td>max.:</td>
<td>TRUE</td>
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<td>run-in</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>run-in</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>main run</td>
<td></td>
<td></td>
<td></td>
<td>run-in</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>run-in std</td>
<td></td>
<td></td>
<td></td>
<td>run-in</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Mrun syn</td>
<td></td>
<td></td>
<td></td>
<td>run-in</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>PP</td>
<td></td>
<td></td>
<td></td>
<td>run-in</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>SA</td>
<td></td>
<td></td>
<td></td>
<td>run-in</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>OPI</td>
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<td></td>
<td></td>
<td>run-in</td>
<td>X</td>
<td></td>
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<tr>
<td>OEM</td>
<td></td>
<td></td>
<td></td>
<td>run-in</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>access rights</td>
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<td></td>
<td></td>
<td>run-in</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>run-in</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>attributes:</td>
<td>global</td>
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</tr>
</tbody>
</table>
### 1.25 Axial system variables

#### $VA\_POSCTRL\_MODE[31]

**Description:**

$VA\_POSCTRL\_MODE[X]$

Position controller mode:
- 0 = Closed-loop position control
- 1 = Closed-loop speed control
- 2 = Stop
- 3 = Park
- 4 = Follow-up

**Description of field limits:**

to be defined

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>MACHAX</th>
<th>SPINDLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCK version</td>
<td></td>
<td></td>
<td></td>
<td>55.00.00</td>
</tr>
</tbody>
</table>

**Unit:**

- 
- min.: 0
- max.: 4

**Run-In:**

- run-in
- main run
- runin stp
- Mrun syn
- PP
- SA
- OPI
- OEM

**Read:**

- X
- X
- X
- X
- X

**Write:**

- Not classified

**Attributes:**

- global
- block search
- link

**Current Value:**

Not classified

---

#### $VA\_SCE[31]

**Description:**

$VA\_SCE[X1]$

Status of speed controller enable

- For SIMODRIVE 611D: The status is supplied directly from the drive.
- For SINAMICS drives with a telegram type greater than 100: The status comes directly from the drive (message word, bit11)
- For other PROFIdrive drives: The status is modeled from further drive status signals (including status word1, bit2)

**Description of field limits:**

to be defined

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>MACHAX</th>
<th>SPINDLE</th>
</tr>
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<tbody>
<tr>
<td>NCK version</td>
<td></td>
<td></td>
<td></td>
<td>55.00.00</td>
</tr>
</tbody>
</table>

**Unit:**

- 
- min.: FALSE
- max.: TRUE

**Run-In:**

- run-in
- main run
- runin stp
- Mrun syn
- PP
- SA
- OPI
- OEM

**Read:**

- X
- X
- X
- X
- X

**Attributes:**

- global
- block search
- link

**Not classified**
### DOUBLE $AA_TRAVEL_DIST[31]$

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total traversing distance of axis in MCS in mm or degrees. The total traversing distance of the axis since the SRAM contents were last erased is added.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Field Limit Description:</th>
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<tbody>
<tr>
<td>to be defined</td>
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<table>
<thead>
<tr>
<th>Axis Identifier:</th>
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</thead>
<tbody>
<tr>
<td>GEOAX</td>
</tr>
<tr>
<td>CHANAX</td>
</tr>
<tr>
<td>MACHAX</td>
</tr>
<tr>
<td>SPINDLE</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linear / angular position</td>
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</table>

<table>
<thead>
<tr>
<th>Min.:</th>
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<tbody>
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<table>
<thead>
<tr>
<th>Max.:</th>
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<tbody>
<tr>
<td>DBL_MAX</td>
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</table>

<table>
<thead>
<tr>
<th>Run-in</th>
</tr>
</thead>
<tbody>
<tr>
<td>main run</td>
</tr>
<tr>
<td>runin stp</td>
</tr>
<tr>
<td>Mrun syn</td>
</tr>
<tr>
<td>PP</td>
</tr>
<tr>
<td>SA</td>
</tr>
<tr>
<td>OPI</td>
</tr>
<tr>
<td>OEM</td>
</tr>
<tr>
<td>access rights</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Read:</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
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<tr>
<td>X</td>
</tr>
<tr>
<td>X</td>
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<tr>
<td>X</td>
</tr>
<tr>
<td>X</td>
</tr>
<tr>
<td>X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Write:</th>
</tr>
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<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Attributes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>global</td>
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<tr>
<td>link</td>
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</tbody>
</table>

Program sensitive Not classified

### DOUBLE $AA_TRAVEL_TIME[31]$

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total traversing time of axis in MCS in seconds. The total traversing time of the axis since the SRAM contents were last erased is added.</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Field Limit Description:</th>
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<table>
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<td>CHANAX</td>
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<tr>
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<tr>
<td>SPINDLE</td>
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<table>
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<th>Unit:</th>
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<table>
<thead>
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<tbody>
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<table>
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<tr>
<th>Max.:</th>
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<tbody>
<tr>
<td>DBL_MAX</td>
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<table>
<thead>
<tr>
<th>Run-in</th>
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</thead>
<tbody>
<tr>
<td>main run</td>
</tr>
<tr>
<td>runin stp</td>
</tr>
<tr>
<td>Mrun syn</td>
</tr>
<tr>
<td>PP</td>
</tr>
<tr>
<td>SA</td>
</tr>
<tr>
<td>OPI</td>
</tr>
<tr>
<td>OEM</td>
</tr>
<tr>
<td>access rights</td>
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<tr>
<th>Read:</th>
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<table>
<thead>
<tr>
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</table>

<table>
<thead>
<tr>
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<tr>
<td>global</td>
</tr>
<tr>
<td>block search</td>
</tr>
<tr>
<td>link</td>
</tr>
</tbody>
</table>

Program sensitive Not classified
### $\text{AA\_TRAVEL\_COUNT}[31]$

**Description:**
Number of traversing operations of axis in MCS. The total number of traversing operations since the SRAM contents were last erased is stored.

**Field Limits:**
- **Axis Identifier:** GEOAX, CHANAX, MACHAX, SPINDLE
- **Unit:** -
- **Min.:** 0.0
- **Max.:** DBL\_MAX
- **Run-in:** main run, runin stp, Mrun syn, PP, SA, OPI, OEM
- **Access Rights:** read: XXX XXXX, write: X X X X
- **Attributes:** global, block search, link
- **Program Sensitive:** Not classified

### $\text{AA\_TRAVEL\_DIST\_HS}[31]$

**Description:**
Total traversing distance of axis in MCS in mm or degrees at high velocity, i.e. at a velocity of >= 80% of the maximum axis velocity. This value is stored in the SRAM.

**Field Limits:**
- **Axis Identifier:** GEOAX, CHANAX, MACHAX, SPINDLE
- **Unit:** Linear / angular position
- **Min.:** 0.0
- **Max.:** DBL\_MAX
- **Run-in:** main run, runin stp, Mrun syn, PP, SA, OPI, OEM
- **Access Rights:** read: XXX XXXX, write: X X X X
- **Attributes:** global, block search, link
- **Program Sensitive:** Not classified
###DOUBLE $AA_TRAVEL_TIME_HS[31]$

**description:**
Total traversing time of axis in seconds at high velocity in MCS, i.e. at a velocity of >= 80% of the maximum axis velocity. This value is stored in the SRAM.

**description of field limits:**
to be defined

<table>
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<td>max.: DBL_MAX</td>
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<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td><strong>main run</strong></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td><strong>runin stp</strong></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td><strong>Mrun syn</strong></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td><strong>PP</strong></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td><strong>SA</strong></td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td><strong>OPI</strong></td>
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<td><strong>access rights</strong></td>
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**attributes:**
global block search link

**Program sensitive**

**Not classified**

###DOUBLE $AA_TRAVEL_COUNT_HS[31]$

**description:**
Number of traversing operations of axis in MCS at high velocity, i.e. at a velocity of >= 80% of the maximum axis velocity. This value is stored in the SRAM.

**description of field limits:**
to be defined

<table>
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<td>max.: DBL_MAX</td>
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<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td><strong>main run</strong></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td><strong>runin stp</strong></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td><strong>Mrun syn</strong></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td><strong>PP</strong></td>
<td>X</td>
<td>X</td>
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<td></td>
</tr>
<tr>
<td><strong>SA</strong></td>
<td>X</td>
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<tr>
<td><strong>OPI</strong></td>
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<tr>
<td><strong>OEM</strong></td>
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<tr>
<td><strong>access rights</strong></td>
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**attributes:**
global block search link

**Program sensitive**

**Not classified**
### $AA\_JERK\_TOT[31]$

<table>
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<th>Description</th>
<th>Unit</th>
<th>Min.</th>
<th>Max.</th>
<th>Access Rights</th>
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<tbody>
<tr>
<td>GEOAX</td>
<td>Total axial jerk in m/s^3. The total jerk applied to the axis is added up and stored in the SRAM.</td>
<td>Linear / angular jerk</td>
<td>0.0</td>
<td>DBL_MAX</td>
<td>read: X X X X X X X X</td>
</tr>
<tr>
<td>CHANAX</td>
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<tr>
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<td>56.00.00</td>
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</table>

### $AA\_JERK\_TIME[31]$

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>Description</th>
<th>Unit</th>
<th>Min.</th>
<th>Max.</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOAX</td>
<td>Total traversing time of axis in seconds in MCS with jerk. The total time period for which the axis traverses with jerk is added up and stored in the SRAM.</td>
<td>s</td>
<td>0.0</td>
<td>DBL_MAX</td>
<td>read: X X X X X X X X</td>
</tr>
<tr>
<td>CHANAX</td>
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<td></td>
</tr>
</tbody>
</table>
### $AA_JERK_COUNT[31]$

**Description:**
Number of traversing operations executed by axis in MCS with jerk. This value is stored in the SRAM.

**Field Limits:**
to be defined

<table>
<thead>
<tr>
<th>Axis Identifier</th>
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<table>
<thead>
<tr>
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<th>Main Run</th>
<th>Run-in Stop</th>
<th>Mrun Syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
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</thead>
<tbody>
<tr>
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<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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</table>

**Attributes:**
Program sensitive

---

### $AC_RPVALID[31]$

**Description:**
$AC_RPVALID[X]$ returns TRUE if a valid Repos position, which can be interrogated with $AC_RETPOINT[axis identifier]$, is available for this axis.

Valid Repos positions are generally available while system and user Asubs are being processed. However, this is not the case in the following situations:
- The Asub activates a modified radius when tool radius compensation is active. $AC_RPVALID$ then returns FALSE for geometry axes while the Asub is running. The newly calculated Repos positions only become available with the approach blocks generated by the REPOS command.
- The end position of the axis was last specified by the main run (FC18, synchronized actions, reciprocation, transfer from another channel after axis replacement).

**Field Limits:**
to be defined

<table>
<thead>
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<th>CHANAX</th>
<th>MACHAX</th>
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<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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**Attributes:**
Not classified
**DOUBLE $VA_SYNCDIFF[31]**

<table>
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<tbody>
<tr>
<td>$VA_SYNCDIFF[FA]</td>
</tr>
<tr>
<td>FA: Following axis/following spindle</td>
</tr>
<tr>
<td>Deviation in synchronism between actual values for LEAD, TRAIL, ELG and COUP.</td>
</tr>
<tr>
<td>The deviation in synchronism between actual values is the deviation in distance between the servo actual position of the following axis/following spindle and a point calculated (according to the coupling rule) from the servo actual position of the leading axis/leading spindle.</td>
</tr>
<tr>
<td>$VA_SYNCDIFF[FA] = $VA_IM[FA] - K($VA_IM[LA])</td>
</tr>
<tr>
<td>K: Coupling rule</td>
</tr>
<tr>
<td>LA: Leading axis/leading spindle</td>
</tr>
</tbody>
</table>

| description of field limits: |
| to be defined |

| axis identifier: |
| GEOAX |
| CHANAX |
| MACHAX |
| SPINDLE |

| unit: Linear / angular position |
| min.: DBL_MIN |
| max.: DBL_MAX |

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<tr>
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<th>runin stp</th>
<th>Mrun syn</th>
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<th>link</th>
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<tbody>
<tr>
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<td>Not classified</td>
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</tr>
</tbody>
</table>
### DOUBLE $AA_SYNCDIFF[31]$

**Description:**

$AA_SYNCDIFF[FA]$

FA: Following axis/following spindle

Deviation in synchronism between setpoints for LEAD, TRAIL, ELG and COUP.

The deviation in synchronism between setpoints is the deviation in distance between the setpoint position of the following axis/following spindle and a point calculated (according to the coupling rule) from the setpoint position of the leading axis/leading spindle.

$AA_SYNCDIFF[FA] = $AA_IM[FA] - K($AA_IM[LA])$

**K:** Coupling rule

**LA:** Leading axis/leading spindle

**Description of field limits:**

to be defined

<table>
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<th>GEOAX</th>
<th>CHANAX</th>
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<td>runin stp</td>
<td>Mrun syn</td>
<td>PP</td>
<td>SA</td>
</tr>
<tr>
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<td>write</td>
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</tr>
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**Attributes:**

- global
- block search
- link

- Not classified
- Not classified

### INT $VA_SYNCDIFF_STAT[31]$

**Description:**

$VA_SYNCDIFF_STAT[FA]$

FA: Following axis/following spindle

Status of synchronism deviation between actual values:

- 4: Reserved
- 3: No valid value in $VA_SYNCDIFF$, tangential control (not TANG(..."P") )
- 2: No valid value in $VA_SYNCDIFF$, master value coupling and simulated MV
- 1: No valid value in $VA_SYNCDIFF$
- 0: No valid value in $VA_SYNCDIFF$, coupling not active
- 1: Valid value in $VA_SYNCDIFF$

**Description of field limits:**

to be defined

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>MACHAX</th>
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<td>Mrun syn</td>
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<td>SA</td>
</tr>
<tr>
<td>read</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
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**Attributes:**

- global
- block search
- link

- Not classified
- Not classified
### INT

$\text{INT} \quad \text{\$AA\_SYNCDIFF\_STAT[31]}$

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<tr>
<th>Description:</th>
</tr>
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<tbody>
<tr>
<td>$\text{$AA_SYNCDIFF_STAT[FA]}$</td>
</tr>
<tr>
<td>FA: Following axis/following spindle</td>
</tr>
<tr>
<td>Status of synchronism deviation between setpoints:</td>
</tr>
<tr>
<td>-4: No valid value in $\text{$AA_SYNCDIFF}$, coupled motion from part program</td>
</tr>
<tr>
<td>-3: Reserved</td>
</tr>
<tr>
<td>-2: Reserved</td>
</tr>
<tr>
<td>-1: No valid value in $\text{$AA_SYNCDIFF}$</td>
</tr>
<tr>
<td>0: No valid value in $\text{$AA_SYNCDIFF}$, coupling not active</td>
</tr>
<tr>
<td>1: Valid value in $\text{$AA_SYNCDIFF}$</td>
</tr>
</tbody>
</table>

<table>
<thead>
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<th>Description of field limits:</th>
</tr>
</thead>
<tbody>
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<table>
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<thead>
<tr>
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### DOUBLE

$\text{DOUBLE} \quad \text{\$AA\_OSCILL\_BREAK\_POS1[31]}$

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\text{$AA_OSCILL_BREAK_POS1[&lt;axis&gt;]}$</td>
</tr>
<tr>
<td>The current approach to reversal position 1 is finished at this position or the last approach to reversal position 1 was finished at this position (reversal position 2 currently being approached).</td>
</tr>
<tr>
<td>$\text{$AA_OSCILL_BREAK_POS1[&lt;axis&gt;]}$ is not equal to $\text{$AA_OSCILL_REVERSE_POS1[&lt;axis&gt;]}$ if the reciprocation motion was interrupted by an external signal (PLC).</td>
</tr>
<tr>
<td>The variable can be accessed only from synchronized actions.</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Description of field limits:</th>
</tr>
</thead>
<tbody>
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<table>
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<td>MACHAX</td>
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<table>
<thead>
<tr>
<th>Unit:</th>
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<tr>
<td>Linear / angular position</td>
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<tbody>
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<td>write:</td>
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</tbody>
</table>

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SINUMERIK 840D sl/840Di sl/ 840D/ 840Di, List of System Variables (PGA1), 01/2008

1-525
### $AA\_OSCILL\_BREAK\_POS2[31]$

**Description:**

The current approach to reversal position 2 is finished at this position or the last approach to reversal position 2 was finished at this position (reversal position 1 currently being approached).

$AA\_OSCILL\_BREAK\_POS2[<axis>]$ is not equal to $AA\_OSCILL\_REVERSE\_POS2[<axis>]$ if the reciprocation motion was interrupted by an external signal (PLC).

The variable can be accessed only from synchronized actions.

**Field limits:**

- **Axis identifier:** GEOAX, CHANAX, MACHAX
- **Unit:** Linear / angular
- **Minimum:** DBL_MIN
- **Maximum:** DBL_MAX
- **Read:** X
- **Write:** X

**Access rights:**

- **Not classified**

### $AA\_BCS\_OFFSET[31]$

**Description:**

Axial variable $AA\_BCS\_OFFSET[ax]$ is used to determine the total axis offsets for an axis. The total consists of the handwheel (DRF) offset, the overlaid movement ($AA\_OFF[ax]$) and the external work offset. This offset is included in the BCS. The MCS is displaced in relation to the BCS according to the offset.

**Field limits:**

- **Axis identifier:** GEOAX, CHANAX, MACHAX, SPINDLE
- **Unit:** -
- **Minimum:** DBL_MIN
- **Maximum:** DBL_MAX
- **Read:** X, X
- **Write:** X

**Access rights:**

- **Not classified**
### $AA\_CHANNO[31]

**Description:**
This variable returns the number of the channel in which the axis is being interpolated. If value 0 is output, the axis could not be assigned to a channel.

**Field Limits:**
To be defined

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>MACHAX</th>
<th>SPINDLE</th>
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</table>

**Unit:** -  
Min.: 0  
Max.: 10

**Read:** X  
**Write:** X

**Attributes:**  
Global  
Block Search  
Link

### $AA\_IW\_CORR[31]

**Description:**
The axial variable $AA\_IW\_CORR[ax]$ determines the actual setpoint value of the workpiece coordinate system (WCS) for the respective axis. The setpoint value corresponds to the initial value of the interpolator for the actual interpolation cycle. As opposed to $AA\_IW$, this value contains the axial overlay shares (DRF, AA\_OFF, external WO, retraction etc.).

**Field Limits:**
To be defined

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>GEOAX</th>
<th>CHANAX</th>
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</table>

**Unit:** Linear / Angular Position  
Min.: DBL_MIN  
Max.: DBL_MAX

**Read:** X  
**Write:** X

**Attributes:**  
Global  
Block Search  
Link

Not classified

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SINUMERIK 840D sl/840Di sl/ 840D/ 840Di, List of System Variables (PGA1), 01/2008 1-527
### $AA\_IEN\_CORR[31]

**description:**
The axial variable $AA\_IEN\_CORR[ax]$ calculates the actual interpolator position of the adjustable coordinate system (ACS) for the specified axis. See also $AA\_IW\_CORR[ax]$. The ACS-Value contains any axial overlay rate (DRF, AA\_OFF, external Frame, etc.).

**description of field limits:**
to be defined

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<tbody>
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</table>

### $AA\_IBN\_CORR[31]

**description:**
The axial variable $AA\_IBN\_CORR[ax]$ calculates the actual interpolator position of the foot coordinate system (FCS) for the specified axis. See also $AA\_IW\_CORR[ax]$. The FCS-Value contains any axial overlay rate (DRF, $AA\_OFF$, external Frame, etc.).

**description of field limits:**
to be defined

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<th>CHANAX</th>
<th>MACHAX</th>
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<th>Linear / angular position</th>
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<td>DBL_MIN</td>
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<td>max.:</td>
<td>DBL_MAX</td>
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<tbody>
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<tr>
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### DOUBLE $\textit{AA_IB_CORR}[31]$

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<thead>
<tr>
<th>Description:</th>
<th>The axial variable $\textit{AA_IB_CORR}[\text{ax}]$ calculates the actual interpolator position of the base coordinate system (BCS) for the specified axis. See also $\textit{AA_IW_CORR}[\text{ax}]$. The BCS-Value contains any axial overlay rate (DRF, $\textit{AA_OFF}$, external Frame, etc.).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Axis identifier:</td>
<td>GEOAX, CHANAX, MACHAX, SPINDLE</td>
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<tr>
<td>Unit:</td>
<td>Linear / Angular position</td>
</tr>
<tr>
<td>Min.:</td>
<td>$\textit{DBL_MIN}$</td>
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### INT $\textit{AA_TYPE}[31]$

<table>
<thead>
<tr>
<th>Description:</th>
<th>$\textit{AA_TYPE}[&lt;\text{axis}&gt;]$ Axis type:</th>
</tr>
</thead>
<tbody>
<tr>
<td>0:</td>
<td>Type is not ascertainable</td>
</tr>
<tr>
<td>1:</td>
<td>NC-Program axis</td>
</tr>
<tr>
<td>2:</td>
<td>Neutral axis</td>
</tr>
<tr>
<td>3:</td>
<td>PLC axis</td>
</tr>
<tr>
<td>4:</td>
<td>Oscillating axis</td>
</tr>
<tr>
<td>5:</td>
<td>Neutral axis which is currently executing a JOG or homing motion</td>
</tr>
<tr>
<td>6:</td>
<td>Following axis coupled via master value</td>
</tr>
<tr>
<td>7:</td>
<td>Coupled motion following axis</td>
</tr>
<tr>
<td>8:</td>
<td>Command axis</td>
</tr>
<tr>
<td>9:</td>
<td>CompileCycles axis</td>
</tr>
<tr>
<td>10:</td>
<td>Coupled slave axis (master-slave function)</td>
</tr>
<tr>
<td>11:</td>
<td>Program axis which is currently executing a JOG or homing motion</td>
</tr>
<tr>
<td>Axis identifier:</td>
<td>GEOAX, CHANAX, MACHAX, SPINDLE</td>
</tr>
<tr>
<td>Unit:</td>
<td>-</td>
</tr>
<tr>
<td>Min.:</td>
<td>0</td>
</tr>
<tr>
<td>Max.:</td>
<td>11</td>
</tr>
<tr>
<td>Attributes:</td>
<td>Global, Block search, Link</td>
</tr>
<tr>
<td>NCK version:</td>
<td>59.00.00</td>
</tr>
</tbody>
</table>
DOUBLE $AA_DTSW[31]

description:
Axial variable $AA_DTSW[ax]$ determines the axial distance (with algebraic sign) from the start of motion in the workpiece coordinate system for positioning and synchronized axes. The programmed position is the only factor used to calculate the distance. If the axis is a coupled axis, the position component derived from the axis coupling is not considered.

description of field limits:
to be defined
axis identifier: GEOAX CHANAX MACHAX SPINDLE
unit: Linear / angular position
min.: DBL_MIN max.: DBL_MAX
run-in main run runin stp Mrun syn PP SA OPI OEM access rights
read: X X X X X
write:
attributes: global block search link
Not classified Not classified

DOUBLE $AA_DTSB[31]

description:
Axial variable $AA_DTSB[ax]$ determines the axial distance (with algebraic sign) from the start of motion in the basic coordinate system for positioning and synchronized axes. The programmed position is the only factor used to calculate the distance. If the axis is a coupled axis, the position component derived from the axis coupling is not considered.

description of field limits:
to be defined
axis identifier: GEOAX CHANAX MACHAX SPINDLE
unit: Linear / angular position
min.: DBL_MIN max.: DBL_MAX
run-in main run runin stp Mrun syn PP SA OPI OEM access rights
read: X X X X X
write:
attributes: global block search link
Not classified Not classified
1.25 Axial system variables

DOUBLE $AA_COUP_CORR[31]

description:
$AA_COUP_CORR[Sn]
with spindle Sn (n: spindle number), example S2: spindle 2 or C: axis C
The variable serves to execute the "Correct synchronism error" function, and provides the compensation value for the position offset of the generic couplings with CPFRS="MCS" (or CPSETTYPE="COUP"). For the duration (MD 30455 MISC_FUNCTION_MASK, bit 7) of the activation of the NC/PLC interface signal. (Synchronlauf nachführen) für die Folgespindel bei aktiver Kopplung werden die Istwerte dieser Spindel mit den Sollwerten verglichen. Die Differenz ist der Korrekturwert, der mit der Systemvariable $AA_COUP_CORR gelesen werden kann.
If the compensation value is known, this value can also be written directly into the system variable. The NC/PLC interface signal (Synchronlauf nachführen) darf in diesem Fall nicht aktiviert sein.
In the coupling module, the variable $AA_COUP_CORR is considered and corrects the setpoint values. The compensation value is deleted when the synchronous spindle coupling is switched on for the relevant following spindle with COUPON(..) or COUPONC(..) as well as in the cases of NC RESET, reference point approach or zero mark synchronization. The system variable returns the value 'zero'.
Depending on the application, the compensation value can also be deleted at an earlier point in time by describing the the variables with the value '0'.
description of field limits:
to be defined
axis identifier: GEOAX CHANAX MACHAX SPINDLE
unit: Linear / angular position
min.: DBL_MIN max.: DBL_MAX
run-in main run runin stp Mrun syn PP SA OPI OEM access rights
read: X X X X X X X
write: X X X X X X
attributes: global block search link
X Not classified No restrictions
### $AA_AXCHANGE_TYP[31]$  
**Description:**
Type of axis with regard to axis replacement
- 0: Axis assigned to NC program
- 1: Axis assigned to PLC, or active as command or reciprocating axis
- 2: Other channel has right to interpolate
- 3: Neutral axis
- 4: Neutral axis controlled by PLC
- 5: Other channel has right to interpolate, axis requested for NC program
- 6: Other channel has right to interpolate, axis requested as neutral axis
- 7: Axis is PLC axis or active as command or reciprocating axis, axis requested for NC program
- 8: Axis is PLC axis or active as command or reciprocating axis, axis requested as neutral axis
- 9: Firmly assigned PLC axis, in neutral axis status
- 10: Firmly assigned PLC axis, controlled by the PLC, in neutral axis status

<table>
<thead>
<tr>
<th>Axis</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>MACHAX</th>
<th>SPINDLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Min.</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Max.</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Read</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Write</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attributes</td>
<td>Global</td>
<td>Block Search</td>
<td>Link</td>
<td></td>
</tr>
<tr>
<td>Classification</td>
<td>Not Classified</td>
<td>Not Classified</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The variable $AA\_INPOS\_STAT[<axis>] returns the status of a programmed axis position. The indexing position is used for indexing axes. In the case of spindles, $AA\_INPOS\_STAT refers to the spindle position of SPOS/SPOSA/M19. In speed control mode M3/M4/M5/SPCOF and after M70 value 0 is always read. $AA\_INPOS\_STAT always refers to the programmed position. The programmed position cannot be reached if end positions change during interpolation (delete distance-to-go, NC Stop, REPOS). At zero speed, the variable then gives the value 0.

Axis positions can be programmed through the part program, synchronized actions, FC18 or as indexing positions.

The variable returns the following values:

0: No status available (axis / spindle outside the programmed position)
1: Awaiting traversing movement
2: Position reached via setpoint
3: Position reached via 'Exact stop coarse'
4: Position reached via 'Exact stop fine'

Note 1: The status referring to the programmed position is independent of the operating mode (AUTOMATIC, JOG, MDI, ...)

Note 2: If additional position components (e.g. following axis couplings, corrections, compensations etc.) are inserted, then the programmed position is no longer identical with the machine axis position. During the period of additional traversings, exact stop signals are deleted, and the status can fall to the value 1.

Note 3: When approaching a position with tight exact stop limits, overshooting can cause the status to drop briefly again in relation to the dynamics of an axis / spindle.

Note 4: Function-dependent, the signals 'Spindle in position' and 'Indexing axis in position' are output on the axial VDI interface.

Note 5: When determining the status of a path axis with G643/G644/G645, the variable $AA\_INPOS\_STAT can remain at the value ‘1’ on account of smoothing behavior during the path motion. Remedy: Use variable $AA\_STAT (however the variable $AA\_STAT does not check whether a programmed position has been reached).

<table>
<thead>
<tr>
<th>$AA_INPOS_STAT[31]</th>
<th>description</th>
</tr>
</thead>
<tbody>
<tr>
<td>INT</td>
<td></td>
</tr>
</tbody>
</table>

description:
The variable $AA\_INPOS\_STAT[<axis>] returns the status of a programmed axis position. The indexing position is used for indexing axes. In the case of spindles, $AA\_INPOS\_STAT refers to the spindle position of SPOS/SPOSA/M19. In speed control mode M3/M4/M5/SPCOF and after M70 value 0 is always read. $AA\_INPOS\_STAT always refers to the programmed position. The programmed position cannot be reached if end positions change during interpolation (delete distance-to-go, NC Stop, REPOS). At zero speed, the variable then gives the value 0.

Axis positions can be programmed through the part program, synchronized actions, FC18 or as indexing positions.

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description of field limits:
to be defined

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>MACHAX</th>
<th>SPINDLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCK version</td>
<td>61.00.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>unit</td>
<td>-</td>
<td>min.: 0</td>
<td>max.: 4</td>
<td></td>
</tr>
<tr>
<td>run-in</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>read</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>write</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

attributes: global block search
### 1.25 Axial system variables

<table>
<thead>
<tr>
<th>INT</th>
<th>$VA_ENC_ZERO_MON_ERR_CNT[n,31]</th>
<th>description:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Incremental and distance-coded measuring systems:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$VA_ENC_ZERO_MON_ERR_CNT[n,ax]$ contains the current number of detected zero mark errors.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Absolute measuring systems ($MA_ENC_TYPE=4$):</td>
<td></td>
</tr>
<tr>
<td></td>
<td>NCK.71 and higher: $VA_ENC_ZERO_MON_ERR_CNT[n,ax]$ contains the current number of detected limit violations during the comparison between the absolute and incremental encoder tracks (limit values see MDs $MA_ENC_ABS_ZEROMON_WARNING$ and $MA_ENC_ABS_ZEROMON_INITIAL$).</td>
<td></td>
</tr>
<tr>
<td></td>
<td>NCK.64 and higher: $VA_ENC_ZERO_MON_ERR_CNT[n,ax]$ contains the current number of deviations in 1/2 coarse increments between the absolute and incremental encoder tracks.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$VA_ENC_ZERO_MON_ERR_CNT[n,ax]$ is initialized to 0 during Power ON.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Reset does not cause a reset.</td>
<td></td>
</tr>
</tbody>
</table>

The indices mean:
- n: Number of encoder
- ax: Machine axis

(See also $MA\_ENC\_ZERO\_MONITORING$ and alarm 25020)

### Description of field limits:
- n: Encoder number to be defined
- axis identifier: GEOAX, CHANAX, MACHAX, SPINDLE

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>MACHAX</th>
<th>SPINDLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCK version:</td>
<td>64.00.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>unit: run-in</td>
<td>main run</td>
<td>run-in</td>
<td>Mrun syn</td>
<td>PP</td>
</tr>
<tr>
<td>min.: 0</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>max.: INT_MAX</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

attributes: global, block search, link
### $VA_{\text{ABSOLUTE ENC_ERR_CNT}}[n,31]

**Description:**
Absolute measuring systems ($MA_{\text{ENC_TYPE}}=4$), only for SIMODRIVE 611D:
This counter is incremented if any new errors have been recognized during transmission of absolute values. This can be used to observe the transmission of absolute values.

**Other systems/drives:**
Variable returns 0.

$VA_{\text{ABSOLUTE ENC_ERR_CNT}}[n,ax]$ is initialized to 0 during Power ON. RESET does not cause a reset.

The indices mean:
n: Number of encoder
ax: Machine axis

description of field limits:
n: Encoder number to be defined

<table>
<thead>
<tr>
<th>Identifier</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>MACHAX</th>
<th>SPINDLE</th>
<th>NCK version: 64.00.00</th>
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</thead>
<tbody>
<tr>
<td>Unit</td>
<td>-</td>
<td>min.: 0</td>
<td>max.:  INT_MAX</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Run-in run run run run syn PP SA OPI OEM access</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Attributes</td>
<td>global block search link</td>
<td>Not classified</td>
<td>Not classified</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### $VA\_ABSOLUTE\_ENC\_STATE[n,31]$  

**description:**  
Absolute measuring systems ($MA\_ENC\_TYPE=4$), only for SIMODRIVE 611D:  
The axial variable $VA\_ABSOLUTE\_ENC\_STATE[n,ax]$ determines the last occurrence of an error state of the absolute encoder interface.  
The indices mean:  
n: Number of encoder  
ax: Machine axis  

**Details:**  
- Bit 0  Interface active  
- Bit 1  Error during parity check  
- Bit 2  Error bit Alarm  
- Bit 3  Error bit CRC error  
- Bit 4  Start bit for EnDat transmission missing  

(see also Description of Functions 'Measuring System Monitoring')  

**Other systems/drives:**  
Variable returns 0.  

**description of field limits:**  
n: Encoder number  
to be defined  

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>MACHAX</th>
<th>SPINDLE</th>
<th>NCK version:</th>
<th>64.00.00</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>unit:</th>
<th>-</th>
<th>min.:</th>
<th>0</th>
<th>max.:</th>
<th>31</th>
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</thead>
<tbody>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin slp</td>
<td>Mrun syn</td>
<td>PP</td>
<td>SA</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>global</td>
<td>block search</td>
<td>link</td>
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<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>attributes:</th>
<th>global</th>
<th>block search</th>
<th>link</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not classified</td>
<td>Not classified</td>
<td></td>
</tr>
</tbody>
</table>
The system variable $P_DIAM_STAT[AX]$ returns the programmed status of the diameter programming in the channel.

The programmed status of the diameter programming is bit-coded:

BIT0 = 0: Diameter programming not active
BIT0 = 1: Diameter programming active

Note: The following bits only have a meaning that can be evaluated if BIT0 = 1:

BIT1 = 0: Channel-specific diameter programming active
BIT1 = 1: Axis-specific diameter programming active

BIT2 = 0: Absolute and incremental dimensions in the diameter
BIT2 = 1: Absolute dimension in the diameter, incremental dimension in the radius

BIT3 = 0: DIAMCYCOF not active
BIT3 = 1: DIAMCYCOF active

<table>
<thead>
<tr>
<th>INT</th>
<th>$P_DIAM_STAT[31]</th>
<th>description</th>
</tr>
</thead>
<tbody>
<tr>
<td>axis</td>
<td>GEOAX</td>
<td></td>
</tr>
<tr>
<td>identifier</td>
<td>CHANAX</td>
<td></td>
</tr>
<tr>
<td></td>
<td>MACHAX</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SPINDLE</td>
<td></td>
</tr>
<tr>
<td>NCK version</td>
<td>65.00.00</td>
<td></td>
</tr>
<tr>
<td>unit</td>
<td>_</td>
<td>min.:</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin stp</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
</tr>
<tr>
<td></td>
<td>Not classified</td>
<td>Not classified</td>
</tr>
</tbody>
</table>
### $AA_DIAM_STAT[31]$

**Description:**
The system variable $AA_DIAM_STAT[AX]$ returns the active main run status of the diameter programming in the channel.

The active status of the diameter programming is bit-coded:
- **BIT0 = 0:** Diameter programming not active
- **BIT0 = 1:** Diameter programming active

**Note:** The following bits only have a meaning that can be evaluated if BIT0 = 1:
- **BIT1 = 0:** Channel-specific diameter programming active
- **BIT1 = 1:** Axis-specific diameter programming active
- **BIT2 = 0:** Absolute and incremental dimensions in the diameter
- **BIT2 = 1:** Absolute dimension in the diameter, incremental dimension in the radius
- **BIT3 = 0:** DIAMCYCOF not active
- **BIT3 = 1:** DIAMCYCOF active

**Axis identifier:**
- GEOAX
- CHANAX
- MACHAX
- SPINDLE

**Attributes:**
- Global
- Block search
- Link

### $P_SCC_STAT[31]$

**Description:**
The system variable $P_SCC_STAT[AX]$ returns the preprocessing status of the G96/G961/G962 assignment in the channel, this has been configured or programmed by SCC[AX].

The status of the G96/G961/G962 assignment is bit-coded:
- **BIT0 = 0:** Axis is not assigned to G96/G961/G962
- **BIT0 = 1:** Axis is assigned to G96/G961/G962

**Axis identifier:**
- GEOAX
- CHANAX
- MACHAX
- SPINDLE

**Attributes:**
- Global
- Block search
- Link

---

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### $AA\_SCC\_STAT[31]$

**Description:**
The system variable $AA\_SCC\_STAT[AX]$ returns the main run status of the G96/G961/G962 assignment in the channel, this has been configured or programmed by SCC[AX].

The status of the G96/G961/G962 assignment is bit-coded:
- **BIT0 = 0:** Axis is not assigned to G96/G961/G962
- **BIT0 = 1:** Axis is assigned to G96/G961/G962

**Description of field limits:**

to be defined

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>MACHAX</th>
<th>SPINDLE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NCK version:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>65.00.00</td>
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<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin slp</td>
</tr>
<tr>
<td>PP</td>
<td>SA</td>
<td>OPT</td>
</tr>
<tr>
<td>access</td>
<td>rights</td>
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</tr>
</tbody>
</table>

**Read:** X X X X

**Write:** X

**Attributes:**
- Global
- Block search
- Link

**Access:**
- Not classified

### $AA\_CPNACTFA[31]$

**Description:**
Still to be defined

**Description of field limits:**

to be defined

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>MACHAX</th>
<th>SPINDLE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NCK version:</strong></td>
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</table>

<table>
<thead>
<tr>
<th>Unit</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin slp</td>
</tr>
<tr>
<td>PP</td>
<td>SA</td>
<td>OPT</td>
</tr>
<tr>
<td>access</td>
<td>rights</td>
<td></td>
</tr>
</tbody>
</table>

**Read:** X X X X

**Write:** X

**Attributes:**
- Global
- Block search
- Link

**Access:**
- Not classified

---

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SINUMERIK 840D sl/840Di sl/ 840D/ 840Di, List of System Variables (PGA1), 01/2008
### $AA_CPFCMDPT[31]$

<table>
<thead>
<tr>
<th>Description:</th>
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<tbody>
<tr>
<td>Description of field limits:</td>
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© Siemens AG 2008 All Rights Reserved
SINUMERIK 840D sl/840Di sl/ 840D/ 840Di, List of System Variables (PGA1), 01/2008
### 1.25 Axial system variables

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MACHAX  
SPINDLE  
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Mrun syn  
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**Description of Field Limits:**

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- GEOAX
- CHANAX
- MACHAX
- SPINDLE

**NCK Version:** 65.00.00

**Unit:** Linear / Angular acceleration

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**Description of Field Limits:**

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- GEOAX
- CHANAX
- MACHAX
- SPINDLE

**NCK Version:** 65.00.00

**Unit:** -

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<td>Maximum:</td>
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<tr>
<td>Read:</td>
<td>X</td>
</tr>
<tr>
<td>Write:</td>
<td>X</td>
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<tr>
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### INT $PA_CPFACT[31]

<table>
<thead>
<tr>
<th>Description:</th>
<th>$PA_CPFACT[AX1]</th>
</tr>
</thead>
<tbody>
<tr>
<td>It is possible to determine whether an axis/ spindle AX1 is being used by a coupling. The coupling type is returned when the coupling is active. The system variable must be read out for the following axis / spindle.</td>
<td></td>
</tr>
<tr>
<td>Bit0, Bit1 tangential following active, TANG</td>
<td></td>
</tr>
<tr>
<td>Bit2 = 1 ('H04') Synchronous spindle active, COUP</td>
<td></td>
</tr>
<tr>
<td>Bit3 = 1 ('H08') Coupled motion active, TRAIL</td>
<td></td>
</tr>
<tr>
<td>Bit4 = 1 ('H10') Master value coupling active, LEAD</td>
<td></td>
</tr>
<tr>
<td>Bit5 = 1 ('H20') Electronic gear active, EG</td>
<td></td>
</tr>
<tr>
<td>Bit6 = 1 ('H40') Gantry grouping active, GANTRY</td>
<td></td>
</tr>
<tr>
<td>Bit7, Bit8 Tangential following active, TANG (with optimization)</td>
<td></td>
</tr>
<tr>
<td>Bit9 = 1 ('H200') Generic coupling active, CP</td>
<td></td>
</tr>
<tr>
<td>Description of field limits:</td>
<td>to be defined</td>
</tr>
<tr>
<td>Axis identifier:</td>
<td>GEOAX</td>
</tr>
<tr>
<td></td>
<td>CHANAX</td>
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<tr>
<td></td>
<td>MACHAX</td>
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<tr>
<td></td>
<td>SPINDLE</td>
</tr>
<tr>
<td>NCK version:</td>
<td>65.00.00</td>
</tr>
<tr>
<td>Unit:</td>
<td>-</td>
</tr>
<tr>
<td>Minimum:</td>
<td>INT_MIN</td>
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</table>
**INT**  
$PA\_CPFPOSSTAT[31]$

<table>
<thead>
<tr>
<th>description:</th>
</tr>
</thead>
</table>

$PA\_CPFPOSSTAT[AX1]$

The validity of the synchronized position (Bit0) and the stop position (Bit1) can be read for an axis / spindle AX1 if the coupling is active.

Bit0 = 1 (‘H01’)  Synchronized position is valid  
Bit1 = 1 (‘H02’)  Stop position is valid

| description of field limits: |
| to be defined |

| axis identifier: |
| GEOAX  
| CHANAX  
| MACHAX  
| SPINDLE |

<table>
<thead>
<tr>
<th>unit:</th>
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</thead>
</table>

| min.: |
| DBL\_MIN |

| max.: |
| DBL\_MAX |

| run-in |
| main run |

| runin stp |
| Mrun syn |

| PP |
| SA |

| OPI |
| OEM |

| access rights |
| read: |
| write: |

attributes: global  
block search

Not classified  
Not classified

---

**STRING**  
$PA\_CPSETTYPE[31]$

| description: |
| Still to be defined |

| description of field limits: |
| to be defined |

| axis identifier: |
| GEOAX  
| CHANAX  
| MACHAX  
| SPINDLE |

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<table>
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<table>
<thead>
<tr>
<th>max.:</th>
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</table>

| run-in |
| main run |

| runin stp |
| Mrun syn |

| PP |
| SA |

| OPI |
| OEM |

| access rights |
| read: |
| write: |

attributes: global  
block search

Not classified  
Not classified
### 1.25 Axial system variables

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<td>NCK version: 66.00.00</td>
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<td></td>
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<td>run in stp</td>
</tr>
<tr>
<td>PP</td>
<td>SA</td>
<td>OPT</td>
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<td>write:</td>
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<td>max.: INT_MAX</td>
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<td>run in stp</td>
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<td>max.: INT_MAX</td>
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<td>main run</td>
<td>run in stp</td>
</tr>
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<td>PP</td>
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<td>read:</td>
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<td>write:</td>
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### STRING $PA_CPFRS[31]$

**description:**
Still to be defined

**description of field limits:**
Still to be defined

**axis identifier:**
- GEOAX
- CHANAX
- MACHAX
- SPINDLE

**unit:**
- \_\_\_
- min.: blank
- max.: blank

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<th>runin stp</th>
<th>Mrun syn</th>
<th>PP</th>
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<th>OPT</th>
<th>OEM</th>
<th>access</th>
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<tr>
<td>X</td>
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<td></td>
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<td>write:</td>
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**attributes:**
- global
- block search
- link

**Not classified**

**STRING $PA_CPFCMSN[31]$**

**description:**
Still to be defined

**description of field limits:**
Still to be defined

**axis identifier:**
- GEOAX
- CHANAX
- MACHAX
- SPINDLE

**unit:**
- \_\_\_
- min.: blank
- max.: blank

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<td>write:</td>
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**attributes:**
- global
- block search
- link

**Not classified**

**STRING $PA_CPFCMN[31]$**

**description:**
Still to be defined

**description of field limits:**
Still to be defined

**axis identifier:**
- GEOAX
- CHANAX
- MACHAX
- SPINDLE

**unit:**
- \_\_\_
- min.: blank
- max.: blank

<table>
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<th>OPT</th>
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<th>access</th>
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**attributes:**
- global
- block search
- link

**Not classified**
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<tr>
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</tr>
<tr>
<td>unit:</td>
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<td>run-in main run runin slp Mrun syn PP SA OPT OEM access rights</td>
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<tr>
<td>read:</td>
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<td>X X</td>
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<td>run-in main run runin slp Mrun syn PP SA OPT OEM access rights</td>
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<tr>
<td>read:</td>
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<tr>
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<td>attributes:</td>
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<td>NCK version: 66.00.00</td>
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<tr>
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<td>run-in main run runin slp Mrun syn PP SA OPT OEM access rights</td>
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<tr>
<td>read:</td>
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<tr>
<td>attributes:</td>
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</table>
# 1 System variable

## 1.25 Axial system variables

### STRING $PA_CPBC[31]$  
**description:** Still to be defined  
**description of field limits:** to be defined  
**axis identifier:** GEOAX, CHANAX, MACHAX, SPINDLE  
**NCK version:** 66.00.00  
**unit:** -  
**min.:**  
**max.:**  
**run-in main run runin stp Mrun syn PP SA OPI OEM access rights**  
**read:** X  
**write:** X  
**attributes:** global, block search, link  
**access rights:** Not classified, Not classified

### AXIS $PA_CPDEFLA[31,n]$  
**description:** Still to be defined  
**description of field limits:**  
**Axis identifier of the following axis:**  
**Index of the requested leading axis:**  
**axis identifier:** GEOAX, CHANAX, MACHAX, SPINDLE  
**NCK version:** 66.00.00  
**unit:** -  
**min.:**  
**max.:**  
**run-in main run runin stp Mrun syn PP SA OPI OEM access rights**  
**read:** X  
**write:** X  
**attributes:** global, block search, link  
**access rights:** Not classified, Not classified
### AXIS 

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<th>$PA_{\text{CPACTLA}[31,n]}$</th>
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<tbody>
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**description of field limits:**

- Axis identifier of the following axis
- Index of the requested active leading axis

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<td>Mrun syn</td>
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<tr>
<td>read:</td>
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### AXIS 

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**description of field limits:**

- Axis identifier of the leading axis
- Index of the requested following axis

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<td>runin stp</td>
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<td>Not classified</td>
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</table>
The variable $AA\_DEPAXO[AX]$ returns an axis code for the stated axis AX, which contains all machine axes with a mechanical dependence on the stated axis.

A dependency is produced by:
- Active coupling modules, the following axis is dependent on the leading axis
- Active transformations, output axes of the transformation are dependent on the input axes of the transformation
- Closed gantry groupings, the slave axes are dependent on the master axis

The given axis itself is also returned in the axis code.

The axis code indicates how the machine data $MC\_AXCONF\_MACHAX\_USED$ refers not directly to the machine axes but to the logical NCK machine axis image ($MN\_AXCONF\_LOGIC\_MACHAX\_TAB$):

- Bit 0 = 0: There is no dependence on the logical machine axis AX1
- Bit 0 = 1: There is a dependence on the logical machine axis AX1
- Bit 1 = 0: There is no dependence on the logical machine axis AX2
- Bit 1 = 1: There is a dependence on the logical machine axis AX2

### Description of Field Limits:
To be defined

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<td>MACHAX</td>
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<tr>
<td>SPINDLE</td>
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<table>
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</tr>
<tr>
<td>Mrun syn</td>
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<td>PP</td>
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<tr>
<td>SA</td>
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<tr>
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<tr>
<td>OEM</td>
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<td>access rights</td>
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Attributes:
- Global
- Block search
- Link

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</table>
### INT $\text{AA\_FIX\_POINT\_SELECTED}[31]$

**description:**

$\text{AA\_FIX\_POINT\_SELECTED}[<\text{Axis}>]$

0: No fixed point selected

$> 0$: Number of the selected fixed point

Via the NC/PLC interface signal (Aktiviere Festpunktfahren in JOG) wird in der Betriebsart JOG das Festpunktfahren aktiviert.

Bits 0-2 indicate the number of the fixed point to be approached.

Activation is confirmed via the NC/PLC interface signal <Festpunktfahren in JOG aktiv/> (Fixed point approach in JOG active). The bits indicate the number of the fixed point to be approached

**description of field limits:**

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>MACHAX</th>
<th>SPINDLE</th>
</tr>
</thead>
<tbody>
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<tr>
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<td>SA</td>
<td>OPI</td>
<td>OEM</td>
</tr>
<tr>
<td>read:</td>
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<td>X</td>
<td>X</td>
<td>X</td>
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<td>write:</td>
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<td>attributes:</td>
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<td>sink</td>
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### INT $\text{AA\_ON\_FIX\_POINT}[31]$

**description:**

$\text{AA\_ON\_FIX\_POINT}[<\text{Axis}>]$

0: Axis is not at a fixed point

$> 0$: Number of the fixed point at which the axis currently stands (the fixed point position is the current position).

This is independent of the way this position was reached.

**description of field limits:**

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<th>CHANAX</th>
<th>MACHAX</th>
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<td>OPI</td>
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### 1 System variable

#### 1.25 Axial system variables

**DOUBLE $VA_ENC1\_COMP\_VAL[31]$**

<table>
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<th>Description:</th>
<th>The axial variable $VA_ENC1_COMP_VAL[ax]$ determines the current compensation value of the measuring system error compensation (encoder 1) in the machine coordinate system (MCS).</th>
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<tr>
<td>Unit:</td>
<td>Linear / angular position</td>
</tr>
<tr>
<td>Min.:</td>
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</tr>
<tr>
<td>Max.:</td>
<td>DBL_MAX</td>
</tr>
<tr>
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**DOUBLE $VA\_ENC2\_COMP\_VAL[31]$**

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<td>DBL_MAX</td>
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<tr>
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<td>Attributes:</td>
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### $VA_CEC_COMP_VAL[31]

**Description:**
The axial variable $VA_CEC_COMP_VAL[ax]$ determines the current compensation value of the sag compensation in the machine coordinate system (MCS).

**Description of Field Limits:**
to be defined

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### $VA_TEMP_COMP_VAL[31]

**Description:**
The axial variable $VA_TEMP_COMP_VAL[ax]$ determines the current compensation value of the temperature compensation in the machine coordinate system (MCS).

**Description of Field Limits:**
to be defined

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Still to be defined

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<tr>
<td>runin stp</td>
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<td>link</td>
</tr>
<tr>
<td>Mrun syn</td>
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<tr>
<td>PP</td>
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<td>X</td>
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### DOUBLE $AA_DTBREB_CMD[31]$ Description:
Still to be defined

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Still to be defined

**Description of Field Limits:**

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**Run-in Main Run Runin Stp Mrun Syn PP SA OPI OEM Access Rights:**

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**Attributes:**

- Global
- Block Search

**Access:**

- Not classified

### $AA_DTBREM_DEP[31]$

**Description:**
Still to be defined

**Description of Field Limits:**

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**Run-in Main Run Runin Stp Mrun Syn PP SA OPI OEM Access Rights:**

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</table>

**Attributes:**

- Global
- Block Search

**Access:**

- Not classified
$AA_BRAKE_CONDB[X]
Shows the pending braking requests (conditions) for the interpolator stop of the axis / spindle. A braking request consists of a collision direction relating to a coordinate axis in the BCS and a braking priority relating to the machining step. If the axis / spindle receives a current braking request on account of these requirement(s), bit 0 is set in $AA_BRAKE_STATE[X] (in the next IPO cycle).

The braking priorities in the positive direction are indicated in bits 0 to 2:
0: No pending braking request
1: Priority 1 covers all positioning actions (G0, POS, SPOS)
2: Priority 2 covers DYNNORM and all priority 1 motions
3: Priority 3 covers DYNPOS and all priority 1 to 2 motions
4: Priority 4 covers DYNROUGH and all priority 1 to 3 motions
5: Priority 5 covers DYNSEMIFIN and all priority 1 to 4 motions
6: Priority 6 covers all motions (including DYNFINISH)
7: Priority 7 covers all motions. The request was triggered by the NC/PLC interface signal. (Vorschub halt/Spindel halt) ausgelöst. Es wird unabhängig von der Bewegungsrichtung immer gebremst.

The braking priorities in the negative direction are indicated in bits 16 to 18:
0 to 7: Same meaning as bits 0 to 2

All other bits are not set.
If the value of the variables is shown in hexadecimal, the left-hand character shows the braking word in the negative direction and the right-hand character shows it in the positive direction.

to be defined

$AA_BRAKE_CONDB[31]

<table>
<thead>
<tr>
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<td>max.: 0x77</td>
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<td>run-in main run runin stp Mrun syn</td>
<td>PP</td>
<td>SA</td>
<td>OPI</td>
<td>OEM</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td>X</td>
<td>X</td>
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NCK version: 68.00.00
$AA_BRAKE_STATE[X]$ returns for the axis/spindle if on account of a request by $AA_BRAKE_CONDB[X]$ or an NC/PLC interface signal (Vorschub halt/Spindel halt) eine Bremsung eingeleitet wurde.

Bit 0 = 1: Current braking request on account of a context-sensitive interpolator stop or an NC/PLC interface signal (Vorschub halt/Spindel halt) ($AA_BRAKE_CONDB[X]$)

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<tbody>
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<td>runin slp</td>
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<tr>
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<tr>
<td>write:</td>
<td></td>
<td></td>
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</table>

attributes: global block search sink

Not classified Not classified
$AA_BRAKE_CONDM[X]$

Shows the pending braking requests (conditions) for the interpolator stop of the axis / spindle. A braking request consists of a collision direction relating to a coordinate axis in the MCS and a braking priority relating to the machining step.

The braking priorities in the positive direction are indicated in bits 0 to 2:
0: No pending braking request
1: Priority 1 covers all positioning actions (G0, POS, SPOS)
2: Priority 2 covers DYNNORM and all priority 1 motions
3: Priority 3 covers DYNNORM and all priority 1 to 2 motions
4: Priority 4 covers DYNROUGH and all priority 1 to 3 motions
5: Priority 5 covers DYNSEMIFIN and all priority 1 to 4 motions
6: Priority 6 covers all motions (including DYNFINISH)
7: Priority 7 covers all motions. The request was triggered by the NC/PLC interface signal. (Vorschub halt/Spindel halt) ausgelöst. Es wird unabhängig von der Bewegungsrichtung immer gebremst.

The braking priorities in the negative direction are indicated in bits 16 to 18:
0 to 7: Same meaning as bits 0 to 2

All other bits are not set.

If the value of the variables is shown in hexadecimal, the left-hand character shows the braking word in the negative direction and the right-hand character shows it in the positive direction.

description of field limits:
to be defined

classification:
Not classified

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<td>X</td>
<td>X</td>
<td>X</td>
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### $AA\_JOG\_POS\_SELECTED[31]$

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<td>$AA_JOG_POS_SELECTED[&lt;Axis&gt;]$</td>
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<tr>
<td>FALSE: JOG to position inactive.</td>
</tr>
<tr>
<td>TRUE: JOG to position active.</td>
</tr>
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Via the NC/PLC interface signal (Aktiviere Anfahren einer Position in JOG) wird in der Betriebsart JOG das Joggen auf Position aktiviert.

**Activation is via the NC/PLC interface signal (Anfahren einer Position in JOG aktiv) bestätigt.**

<table>
<thead>
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<th>Main run</th>
<th>Runin slop</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>Access rights</th>
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Not classified

### $AA\_JOG\_POS\_ACT[31]$

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<td>$AA_JOG_POS_ACT[&lt;Axis&gt;]$</td>
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<tr>
<td>FALSE: Position not reached by JOG to position.</td>
</tr>
<tr>
<td>TRUE: Position reached by JOG to position.</td>
</tr>
</tbody>
</table>

Via the PLC signal (Aktiviere Anfahren einer Position in JOG) wird in der Betriebsart JOG das Joggen auf Position aktiviert.

**Activation is via the NC/PLC interface signal DB31, ... DBX75.6 und die Systemvariable $AA\_JOG\_POS\_SELECTED[<Achse>] bestätigt.**

The position is reached via the NC/PLC interface signal (In JOG anzufahrende Position ist erreicht) gemeldet.

**The position reached was defined by the setting data $SA\_JOG\_POSITION[<Axis>]$.**

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<th>Runin slop</th>
<th>Mrun syn</th>
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<th>OPT</th>
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<th>Access rights</th>
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<th>Write:</th>
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Not classified

© Siemens AG 2008 All Rights Reserved
SINUMERIK 840D sl/840Di sl/ 840D/ 840Di, List of System Variables (PGA1), 01/2008
DOUBLE $AA_PCS_REL[31]  

description:  
The axial variable $AA_PCS_REL[ax]$ determines the current relative setpoint value in the workpiece  
coordinate system (WCS) for the corresponding axis. The setpoint value corresponds to $AA_IW[ax]$, which  
is transformed by the current relative system frame $P_{RELFRAME}$. The axial positions lie in the relative  
WCS coordinate system.

description of field limits:  
to be defined

axis identifier: GEOAX  
CHANAX  
MACHAX  
SPINDLE  

unit: Linear / angular position

run-in main run runin slp Mrun syn PP SA OPI OEM access rights

read: X X X X X X X

write:  
attributes: global block search link

Not classified  Not classified

DOUBLE $AA_ACS_REL[31]  

description:  
The axial variable $AA_ACS_REL[ax]$ determines the current relative setpoint value in the settable zero  
point coordinate system (SZS) for the corresponding axis. The setpoint value corresponds to $AA_IEN[ax]$,  
which is transformed by the current relative system frame $P_{RELFRAME}$. The axial positions lie in the  
relative SZS coordinate system.

description of field limits:  
to be defined

axis identifier: GEOAX  
CHANAX  
MACHAX  
SPINDLE  

unit: Linear / angular position

run-in main run runin slp Mrun syn PP SA OPI OEM access rights

read: X X X X X X X

write:  
attributes: global block search link

Not classified  Not classified
### **1.25 Axial system variables**

#### **$\text{INT}$**

**$\text{AA_EG_TYPE}[31,31]$**

- **description:**
  - $\text{AA_EG_TYPE}[a,b]$
  - a: Following axis
  - b: Leading axis
  - Type of coupling for leading axis b
  - -1: no coupling defined
  - 0: Actual value coupling
  - 1: Setpoint value coupling

- **description of field limits:**
  - to be defined

- **axis identifier:**
  - GEOAX
  - CHANAX
  - MACHAX
  - SPINDLE

- **unit:**
  - \( \text{min.} : \ \text{max.} = 1 \)

- **run-in main run runin stp Mrun syn PP SA OPI OEM access rights**
  - read: X X X X X X X X
  - write: Not classified Not classified

- **attributes:**
  - global
  - block search
  - sink
  - Not classified

- **NCK version:** 18.00.00

#### **$\text{DOUBLE}$**

**$\text{AA_EG_NUMERA}[31,31]$**

- **description:**
  - $\text{AA_EG_NUMERA}[a,b]$
  - a: Following axis
  - b: Leading axis
  - Numerator of coupling factor for leading axis b

- **description of field limits:**
  - to be defined

- **axis identifier:**
  - GEOAX
  - CHANAX
  - MACHAX
  - SPINDLE

- **unit:**
  - Linear / angular position

- **min.: DBL_MIN max.: DBL_MAX**

- **run-in main run runin stp Mrun syn PP SA OPI OEM access rights**
  - read: X X X X X X X X
  - write: Not classified Not classified

- **attributes:**
  - global
  - block search
  - sink
  - Not classified

- **NCK version:** 18.00.00
### $\$AA_{ \text{EG\_DENOM}}_{[a,b]}$

**Description:**
- Following axis: $a$
- Leading axis: $b$
- Denominator of coupling factor for leading axis $b$

**Field Limits:**
- To be defined

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</thead>
</table>

### $\$AA_{ \text{EG\_SYN}}_{[a,b]}$

**Description:**
- Following axis: $a$
- Leading axis: $b$
- Synchronous position of leading axis $b$

**Field Limits:**
- To be defined

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<th>CHANAX</th>
<th>MACHAX</th>
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<td>Unit</td>
<td>Linear / Angular Position</td>
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<td>Max.</td>
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</table>
### BOOL $AA_EG_ACTIVE[31,31]$

**Description:**
$AA_EG_ACTIVE[a,b]$
- **a:** Following axis
- **b:** Leading axis
Coupling for leading axis b is active, i.e. switched on

**Axis Identifier:**
- GEOAX
- CHANAX
- MACHAX
- SPINDLE

**Unit:**
- Linear
- Angular

**NCK Version:** 18.00.00

**Field Limits:**
- Min.: FALSE
- Max.: TRUE

**Access Rights:**
- Run-in: X
- Main Run: X
- Run-in Stop: X
- Mrun Syn: X

**Attributes:**
- Global
- Block Search
- Link

Not classified

### DOUBLE $AA_CPLCMDP[31,31]$

**Description:**
Still to be defined

**Axis Identifier:**
- GEOAX
- CHANAX
- MACHAX
- SPINDLE

**Unit:**
- Linear
- Angular

**NCK Version:** 65.00.00

**Field Limits:**
- Min.: DBL_MIN
- Max.: DBL_MAX

**Access Rights:**
- Run-in: X
- Main Run: X
- Run-in Stop: X
- Mrun Syn: X

**Attributes:**
- Global
- Block Search
- Link

Not classified
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**DOUBLE**

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### $AA_CPLSTATE[31,31]$ 

**STRING**

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<tr>
<td></td>
<td></td>
<td>CHANAX</td>
<td></td>
<td>run-in</td>
<td>main run</td>
<td>runin slp</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MACHAX</td>
<td></td>
<td>read:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>SPINDLE</td>
<td></td>
<td>write:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>attributes:</td>
<td></td>
<td></td>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| | X | Not classified | Not classified |
### 1.25 Axial system variables

| Variable | Description | Axis Identifier | Unit | Min. | Max. | Run-in | Main Run | Runin Stop | Mrun Syn | PP | SA | OPI | OEM | Access Rights | Read | Write | Attributes |
|----------|-------------|----------------|------|------|------|--------|----------|-----------|----------|-------|----|-----|-----|-----|---------------|------|-------|------------|
| $AA_CPLNUM[31,31]$ | Still to be defined | GEOAX, CHANAX, MACHAX, SPINDLE | -   | DBL_MIN | DBL_MAX | X | X | X | X | X | X | X | X | X | X | X | X | Not classified | Not classified |
| $AA_CPLDEN[31,31]$ | Still to be defined | GEOAX, CHANAX, MACHAX, SPINDLE | -   | DBL_MIN | DBL_MAX | X | X | X | X | X | X | X | X | X | X | X | X | Not classified | Not classified |
### $AA_CPLCTID[31,31]$

<table>
<thead>
<tr>
<th>Description</th>
<th>value</th>
</tr>
</thead>
<tbody>
<tr>
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**Description of field limits:**

- **axis identifier:** GEOAX, CHANAX, MACHAX, SPINDLE
- **NCK version:** 65.00.00
- **Unit:** -
- **min.:** INT_MIN
- **max.:** INT_MAX

**Access rights:**
- read: XXX XXXX
- write: XXX XXXX

**Attributes:**
- global
- block search
- link

**X** Not classified

### $AA_CPLSETVAL[31,31]$

<table>
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<tr>
<th>Description</th>
<th>value</th>
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</thead>
<tbody>
<tr>
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</tbody>
</table>

**Description of field limits:**

- **axis name:** to be defined
- **axis identifier:** GEOAX, CHANAX, MACHAX, SPINDLE
- **NCK version:** 65.00.00
- **Unit:** -
- **min.:**
- **max.:**

**Access rights:**
- read: XXX XXXX
- write: XXX XXXX

**Attributes:**
- global
- block search
- link

**X** Not classified
### INT $PA_CPLTYPE[31,31]$

<table>
<thead>
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<th>axis identifier</th>
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<tbody>
<tr>
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<tr>
<td>CHANAX</td>
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<tr>
<td>MACHAX</td>
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</tr>
<tr>
<td>SPINDLE</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>description:</th>
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<tbody>
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<table>
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<tbody>
<tr>
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<td>0</td>
<td>512</td>
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</table>

<table>
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<th>runin stp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>access rights</th>
</tr>
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<tbody>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<td>block search</td>
<td>link</td>
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- Not classified
- Not classified

### STRING $PA_CPLSTATE[31,31]$

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</thead>
<tbody>
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</tr>
<tr>
<td>CHANAX</td>
<td></td>
</tr>
<tr>
<td>MACHAX</td>
<td></td>
</tr>
<tr>
<td>SPINDLE</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>description:</th>
</tr>
</thead>
<tbody>
<tr>
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<tr>
<td>CHANAX</td>
<td></td>
</tr>
<tr>
<td>MACHAX</td>
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<tr>
<td>SPINDLE</td>
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<table>
<thead>
<tr>
<th>unit</th>
<th>min.</th>
<th>max.</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>512</td>
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<table>
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<tr>
<th>run-in</th>
<th>main run</th>
<th>runin stp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>read:</td>
<td>X</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>write:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
<td>link</td>
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- Not classified
- Not classified
### 1.25 Axial system variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
<th>Axis Identifier</th>
<th>NCK Version</th>
<th>Unit</th>
<th>Min.</th>
<th>Max.</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>$PA_CPLNUM[31,31]$</td>
<td>Still to be defined</td>
<td>GEOAX, CHANAX, MACHAX, SPINDLE</td>
<td>66.00.00</td>
<td>-</td>
<td>DBL_MIN</td>
<td>DBL_MAX</td>
<td>read: X, write: X</td>
</tr>
<tr>
<td>$PA_CPLDEN[31,31]$</td>
<td>Still to be defined</td>
<td>GEOAX, CHANAX, MACHAX, SPINDLE</td>
<td>66.00.00</td>
<td>-</td>
<td>DBL_MIN</td>
<td>DBL_MAX</td>
<td>read: X, write: X</td>
</tr>
</tbody>
</table>
### 1.25 Axial system variables

<table>
<thead>
<tr>
<th>Data Type</th>
<th>Description</th>
<th>Axis Identifier</th>
<th>Axis Name</th>
<th>NCK Version</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INT</strong></td>
<td>$PA_CPLCTID[31,31]$</td>
<td>GEOAX, CHANAX, MACHAX, SPINDLE</td>
<td>Still to be defined</td>
<td>66.00.00</td>
</tr>
</tbody>
</table>

**Unit:** INT
**Min.:** INT_MIN
**Max.:** INT_MAX

- **Run-in:** main
- **Run-in:** run
- **Mrun syn:** PP
- **SA:** OPI
- **OEM:** access
- **Read:** X
- **Write:** X

**Attributes:** global, block, search

<table>
<thead>
<tr>
<th>Data Type</th>
<th>Description</th>
<th>Axis Identifier</th>
<th>Axis Name</th>
<th>NCK Version</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>STRING</strong></td>
<td>$PA_CPLSETVAL[31,31]$</td>
<td>GEOAX, CHANAX, MACHAX, SPINDLE</td>
<td>Still to be defined</td>
<td>66.00.00</td>
</tr>
</tbody>
</table>

**Unit:** INT
**Min.:** INT_MIN
**Max.:** INT_MAX

- **Run-in:** main
- **Run-in:** run
- **Mrun syn:** PP
- **SA:** OPI
- **OEM:** access
- **Read:** X
- **Write:** X

**Attributes:** global, block, search

<table>
<thead>
<tr>
<th>Data Type</th>
<th>Description</th>
<th>Axis Identifier</th>
<th>Axis Name</th>
<th>NCK Version</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>STRING</strong></td>
<td>$PA_CPLSETVAL[31,31]$</td>
<td>GEOAX, CHANAX, MACHAX, SPINDLE</td>
<td>Still to be defined</td>
<td>66.00.00</td>
</tr>
</tbody>
</table>

**Unit:** INT
**Min.:** INT_MIN
**Max.:** INT_MAX

- **Run-in:** main
- **Run-in:** run
- **Mrun syn:** PP
- **SA:** OPI
- **OEM:** access
- **Read:** X
- **Write:** X

**Attributes:** global, block, search

Not classified
**$VA_ENC_ZERO_MON_ACCESS_CNT[n,ax]$**

**Description:**
Incremental and distance-coded measuring systems, only for SIMODRIVE 611D:
This system variable, which is effective during computation time with this type of encoder, is only supplied if
bit_0 = 1 is set in $MA_ENC_ZERO_MONITORING_SYSVAR_CTRL$.
After the initialization phase, the system variable is incremented after every minute if one or more zero
marks have been detected during this time. During the initialization phase, it is incremented at each
detected, protected zero mark.

See also $MA_ENC_ZEROMON_SYSVAR_CTRL$

Absolute measuring systems ($MA_ENC_TYPE=4$), only for SIMODRIVE 611D:
This counter is incremented upon each successful NC access to a valid EnDat absolute value.

Other drives or deactivated:
Variable returns 0.

$VA_ENC_ZERO_MON_ACCESS_CNT[n,ax]$ is initialized to 0 at power ON. RESET does not cause a
reset.

The indices mean:
n: Number of encoder
ax: Machine axis

description of field limits:
n: Encoder number
to be defined

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>MACHAX</th>
<th>SPINDLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCK version:</td>
<td></td>
<td></td>
<td></td>
<td>71.00.00</td>
</tr>
<tr>
<td>unit:</td>
<td>-</td>
<td>min.: 0</td>
<td>max.:</td>
<td>INT_MAX</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
<td>sink</td>
<td>Not classified</td>
</tr>
</tbody>
</table>
### INT $VA_ABSOLUTE_ENCZERO_MON_MAX[n,31]$  

**Description:**
Absolute measuring systems ($MA_ENC_TYPE=4$), only for SIMODRIVE 611D:
This system variable contains the maximum value of $VA_ENC_ZERO_MON_ACT$ since the encoder was switched on.

**Other systems/drives:**
Variable returns 0.

For $VA_ABSOLUTE_ENC_ZERO_MON_MAX[n,ax]$ is initialized to 0 at power ON and encoder selection. 
RESET does not cause a reset.

The indices mean:
n: Number of encoder
ax: Machine axis

**Description of field limits:**
n: Encoder number
to be defined

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>MACHAX</th>
<th>SPINDLE</th>
<th>NCK version: 71.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit:</td>
<td>-</td>
<td>min.: 0</td>
<td>max.:  INT_MAX</td>
<td></td>
<td></td>
</tr>
<tr>
<td>run-in run main run runin slp Mrun syn PP SA OPT OEM access rights</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>attributes:</td>
<td>global block search</td>
<td>sxn</td>
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<td>Not classified</td>
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</tr>
</tbody>
</table>

© Siemens AG 2008 All Rights Reserved
SINUMERIK 840D sl/840Di sl' 840D/ 840Di, List of System Variables (PGA1), 01/2008
### $VA_{\text{ABSOLUTE ENC DELTA INIT}}[n,ax]$ Description

<table>
<thead>
<tr>
<th>Description: Only with absolute encoders: This value includes the initial difference value between the last absolute position buffered in the SRAM and the current absolute position (in the format internal increment - see machine data $\text{MN_INT_PER_MM}$ and $\text{MN_INT_PER_DEG}$). The value is updated at power ON, warm restart, park deselect and return below the encoder limit frequency. Other encoders: Variable returns 0. $VA_{\text{ABSOLUTE ENC DELTA INIT}}[n,ax]$ is recalculated during power ON. RESET does not cause a reset.</th>
</tr>
</thead>
</table>

**Meaning of the indices:**
- **n:** Encoder number
- **ax:** Machine axis

**Description of field limits:**
- **n:** Encoder number to be defined

**Axis identifier:**
- GEOAX
- CHANAX
- MACHAX
- SPINDLE

**Unit:** -
**min.:** 0
**max.:** 31

**Run-in**
- main run
- runin stp
- Mrun syn

**Access rights**
- PP
- SA
- OPT
- OEM

**Read:**
- X

**Write:**
- X
- X
- X
- X
- X

**Attributes:**
- global
- block search
- link

- Not classified
- Not classified

**NCK version:** 71.00.00
### $VA\_ENC\_ZERO\_MON\_ACT[n,31]$

**Description:**

Incremental and distance-coded measuring systems, only for SIMODRIVE 611D:
This system variable contains the current hardware counter value of the last zero mark passed.

Absolute measuring systems ($MA\_ENC\_TYPE=4$), only for SIMODRIVE 611D:
This system variable contains the current difference (amount) between the control position and the newly formed absolute position in the format 1/4 coarse encoder increments.

Other drives:
Variable returns 0.

$VA\_ENC\_ZERO\_MON\_ACT[n,ax]$ is initialized to 0 at power ON. RESET does not cause a reset.

The indices mean:
- **n**: Number of encoder
- **ax**: Machine axis

#### Description of Field Limits:

- **n**: Encoder number to be defined
- **ax**: Machine axis identifier:
  - GEOAX
  - CHANAX
  - MACHAX
  - SPINDLE

#### Attributes:

- **global**
- **block search**
- **link**

---

<table>
<thead>
<tr>
<th>n: Encoder number</th>
<th>ax: Machine axis identifier</th>
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</thead>
<tbody>
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<tr>
<td>CHANAX</td>
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<td>MACHAX</td>
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<tr>
<td>SPINDLE</td>
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</tr>
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</table>

<table>
<thead>
<tr>
<th>unit:</th>
<th>min.: 0</th>
<th>max.: 31</th>
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</thead>
<tbody>
<tr>
<td>run-in</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>main run</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>runin</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>syn</td>
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<td>X</td>
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<tr>
<td>PP</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>SA</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>OPI</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>OEM</td>
<td>X</td>
<td>X</td>
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<table>
<thead>
<tr>
<th>rights: access</th>
<th>read: XXX XXXX</th>
<th>write:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### $VA_ENC_ZERO_MON_INIT[n,31]

**Description:**
Incremental and distance-coded measuring systems, only for SIMODRIVE 611D:
This system variable contains the initial hardware counter value with which all further hardware counter values of the zero marks are compared.

**Other systems/drives:**
Variable returns 0.

$VA_ENC_ZERO.Mon_Init[n,ax]$ is initialized to 0 at power ON and encoder selection. RESET does not cause a reset.

The indices mean:
- **n**: Number of encoder
- **ax**: Machine axis

**Description of field limits:**
- **n**: Encoder number to be defined

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>MACHAX</th>
<th>SPINDLE</th>
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<tbody>
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</table>

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<td>X</td>
</tr>
<tr>
<td>main run</td>
<td>X</td>
</tr>
<tr>
<td>runin slp</td>
<td>X</td>
</tr>
<tr>
<td>Mrun syn</td>
<td>X</td>
</tr>
<tr>
<td>PP</td>
<td>X</td>
</tr>
<tr>
<td>SA</td>
<td>X</td>
</tr>
<tr>
<td>OPR</td>
<td></td>
</tr>
<tr>
<td>OEM</td>
<td></td>
</tr>
<tr>
<td>access rights</td>
<td></td>
</tr>
</tbody>
</table>

**Attributes:**
- Global
- Block search
- Link

### $AA_COUP_CORR_DIST[31]

**Description:**
$AA_COUP_CORR_DIST[Sn]$ with spindle Sn (n: spindle number), example S2: spindle 2 or C: axis C
The variable serves to display the distance to go of $AA_COUP_CORR$ (compensation value for the position offset with generic couplings) for the "Correct synchronism error" function.

**Description of field limits:**
- to be defined

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>MACHAX</th>
<th>SPINDLE</th>
</tr>
</thead>
<tbody>
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</tr>
<tr>
<td>main run</td>
<td>X</td>
</tr>
<tr>
<td>runin slp</td>
<td>X</td>
</tr>
<tr>
<td>Mrun syn</td>
<td>X</td>
</tr>
<tr>
<td>PP</td>
<td>X</td>
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<tr>
<td>SA</td>
<td>X</td>
</tr>
<tr>
<td>OPR</td>
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</tr>
<tr>
<td>OEM</td>
<td></td>
</tr>
<tr>
<td>access rights</td>
<td></td>
</tr>
</tbody>
</table>

**Attributes:**
- Global
- Block search
- Link
- Not classified
### $AA_CPLINTR[31,31]$

**Description:**
Still to be defined

**Description of Field Limits:**
Axis identifier for the following axis
Axis identifier for the leading axis

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>NCK Version</th>
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<tbody>
<tr>
<td>GEOAX</td>
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</tr>
<tr>
<td>CHANAX</td>
<td></td>
</tr>
<tr>
<td>MACHAX</td>
<td></td>
</tr>
<tr>
<td>SPINDLE</td>
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<table>
<thead>
<tr>
<th>Unit</th>
<th>Min.</th>
<th>Max.</th>
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<tbody>
<tr>
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<td>DBL_MIN</td>
<td>DBL_MAX</td>
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<table>
<thead>
<tr>
<th>Read</th>
<th>Write</th>
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<tbody>
<tr>
<td>X</td>
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<td>global</td>
</tr>
<tr>
<td>X</td>
<td>X</td>
<td>block</td>
</tr>
<tr>
<td>X</td>
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<td>search</td>
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<tr>
<td>X</td>
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### $AA_CPLINSC[31,31]$

**Description:**
Still to be defined

**Description of Field Limits:**
Axis identifier for the following axis
Axis identifier for the leading axis

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>NCK Version</th>
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<tbody>
<tr>
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<td>71.00.00</td>
</tr>
<tr>
<td>CHANAX</td>
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<tr>
<td>MACHAX</td>
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<td>SPINDLE</td>
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<table>
<thead>
<tr>
<th>Unit</th>
<th>Min.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>DBL_MIN</td>
<td>DBL_MAX</td>
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<table>
<thead>
<tr>
<th>Read</th>
<th>Write</th>
<th>Attributes</th>
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<tbody>
<tr>
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<td>link</td>
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| X | Not classified | Not classified |
### 1.25 Axial system variables

#### DOUBLE $AA_CPLOUTTR[31,31]$  
**description:** Still to be defined

**description of field limits:**
- Axis identifier for the following axis
- Axis identifier for the leading axis

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<tbody>
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<td>min.:</td>
<td>DBL_MIN</td>
</tr>
<tr>
<td>max.:</td>
<td>DBL_MAX</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
</tr>
<tr>
<td>runin stp</td>
<td>Mrun syn</td>
</tr>
<tr>
<td>PP</td>
<td>SA</td>
</tr>
<tr>
<td>OPI</td>
<td>OEM</td>
</tr>
<tr>
<td>access rights</td>
<td>read: X</td>
</tr>
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<td></td>
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#### DOUBLE $AA_CPLOUTSC[31,31]$  
**description:** Still to be defined

**description of field limits:**
- Axis identifier for the following axis
- Axis identifier for the leading axis

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<table>
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<td>DBL_MIN</td>
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<tr>
<td>run-in</td>
<td>main run</td>
</tr>
<tr>
<td>runin stp</td>
<td>Mrun syn</td>
</tr>
<tr>
<td>PP</td>
<td>SA</td>
</tr>
<tr>
<td>OPI</td>
<td>OEM</td>
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<td>access rights</td>
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### DOUBLE $PA_CPLINTR[31,31]$

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Axis identifier for the following axis |
| Axis identifier: | GEOAX  
CHANAX  
MACHAX  
SPINDLE |
| NCK version: | 71.00.00 |
| Unit: | Linear / angular position |
| Min.: | DBL_MIN |
| Max.: | DBL_MAX |
| Run-in | Main run  
Runin stp  
Mrun syn  
PP  
SA  
OPI  
OEM |
| Read: | X  
X |
| Write: | |
| Attributes: | Global  
Block search  
Link  
Not classified  
Not classified |

### DOUBLE $PA_CPLINSC[31,31]$

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Axis identifier for the leading axis |
| Axis identifier: | GEOAX  
CHANAX  
MACHAX  
SPINDLE |
| NCK version: | 71.00.00 |
| Unit: | Linear / angular position |
| Min.: | DBL_MIN |
| Max.: | DBL_MAX |
| Run-in | Main run  
Runin stp  
Mrun syn  
PP  
SA  
OPI  
OEM |
| Read: | X  
X |
| Write: | |
| Attributes: | Global  
Block search  
Link  
Not classified  
Not classified |
### DOUBLE $PA_CPLOUTTR[31,31]$

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<tr>
<td>Maximum</td>
<td>DBL_MAX</td>
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<td>NCK version</td>
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<tr>
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<td>Linear / angular position</td>
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<td>Max.</td>
<td>DBL_MAX</td>
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<td>Read</td>
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<td>Write</td>
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<td>Attributes</td>
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### DOUBLE $PA_CPLOUTSC[31,31]$

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<td>X, X</td>
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<td>Write</td>
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<td>Global, Block, Search, Link</td>
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<td>DOUBLE $AA_CPSYNCOP[31]$</td>
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<td>---</td>
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<td>main run</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
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<td>NCK version: 71.00.00</td>
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<tr>
<td>unit: Linear / angular position</td>
<td>min.: DBL_MIN</td>
<td>max.: DBL_MAX</td>
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<tr>
<td>run-in</td>
<td>main run</td>
<td>runin slp</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
</tr>
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<td>write:</td>
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<tr>
<td>NCK version:</td>
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<tr>
<td>Unit:</td>
<td>Linear / angular speed</td>
</tr>
<tr>
<td>Min.:</td>
<td>DBL_MIN</td>
</tr>
<tr>
<td>Max.:</td>
<td>DBL_MAX</td>
</tr>
<tr>
<td>Run-in</td>
<td>Main run, runin slp, Mrun syn, PP, SA, OPI, OEM</td>
</tr>
<tr>
<td>Read:</td>
<td>X, X, X, X, X, X, X</td>
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<tr>
<td>Write:</td>
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### $AA_CPSYNFIV[31]$

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<tr>
<td>Unit:</td>
<td>Linear / angular speed</td>
</tr>
<tr>
<td>Min.:</td>
<td>DBL_MIN</td>
</tr>
<tr>
<td>Max.:</td>
<td>DBL_MAX</td>
</tr>
<tr>
<td>Run-in</td>
<td>Main run, runin slp, Mrun syn, PP, SA, OPI, OEM</td>
</tr>
<tr>
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<td>Write:</td>
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### $PA_CPSYNCOP[31]$

**Description:**
Still to be defined

**Description of Field Limits:**
- **Axis/Spindle Identifier:** GEOAX, CHANAX, MACHAX, SPINDLE
- **Unit:** Linear / angular position
- **Minimum:** DBL_MIN
- **Maximum:** DBL_MAX

<table>
<thead>
<tr>
<th>Run-in</th>
<th>Main Run</th>
<th>Runin SLP</th>
<th>Mrun Syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>Access Rights</th>
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<tbody>
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<td></td>
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**Attributes:**
- Global
- Block search
- Link

- Not classified
- Not classified

### $PA_CPSYNFIP[31]$

**Description:**
Still to be defined

**Description of Field Limits:**
- **Axis/Spindle Identifier:** GEOAX, CHANAX, MACHAX, SPINDLE
- **Unit:** Linear / angular position
- **Minimum:** DBL_MIN
- **Maximum:** DBL_MAX

<table>
<thead>
<tr>
<th>Run-in</th>
<th>Main Run</th>
<th>Runin SLP</th>
<th>Mrun Syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>Access Rights</th>
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<tbody>
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**Attributes:**
- Global
- Block search
- Link

- Not classified
- Not classified
### 1.25 Axial system variables

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<th>NCK version</th>
<th>Read</th>
<th>Write</th>
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<th>Attributes</th>
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<td>X</td>
<td></td>
<td></td>
<td>global, block search, link</td>
</tr>
</tbody>
</table>
The axial variable $AA_{ITR}[ax]$ determines the current setpoint value of an axis at the output of the nth chained transformation.

The following applies to the data of the transformation layer:
- Transformation layer 0: The positions correspond to the BCS positions, that means $AA_{ITR}[x,0]$ corresponds to $AA_{IB}[x]$.
- Transformation layer 1: Position setpoint of the axis at the output of the 1st transformation.
- Transformation layer 2: Position setpoint of the axis at the output of the 2nd transformation.
- Transformation layer 3: Position setpoint of the axis at the output of the 3rd transformation.
- Transformation layer 4: Position setpoint of the axis at the output of the 4th transformation, that means $AA_{ITR}[x,4]$ corresponds to $AA_{IM}[x]$.

If the transformation chain does not consist of 4 single transformations, then the highest layers return the same setpoint values.

### Description of Field Limits
- To be defined

### Axis Identifier
- GEOAX
- CHANAX
- MACHAX
- SPINDLE

### Unit
- Linear / angular position

### Minimum/Maximum
- $DBL\_MIN$
- $DBL\_MAX$

### Read/Write
- X X X
- X X X

### Attributes
- Global
- Block search
- Link

### Access Rights
- Not classified
- Not classified

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<th>CHANAX</th>
<th>MACHAX</th>
<th>SPINDLE</th>
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<td>Linear / angular position</td>
<td>$DBL_MIN$</td>
<td>$DBL_MAX$</td>
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<td>main run</td>
<td>runin std</td>
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<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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### 1.25 Axial system variables

#### DOUBLE $AA_IBC[31]

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<tr>
<td>The axial variable $AA_IBC[ax]$ determines the position setpoint of a cartesian axis lying between BCS and MCS. &quot;Cartesian&quot; means that the axis is a linear axis which lies plane-parallel to a coordinate axis in a clockwise coordinate system. This value is returned if a geometry axis is still cartesian at the output of the nth transformation. The axis identifier used must represent a geometry axis in the BCS, otherwise the variable returns the value 0.</td>
<td></td>
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</tbody>
</table>

<table>
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axis identifier: | GEOAX | CHANAX | MACHAX | SPINDLE |

unit: | Linear / angular position |
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<tbody>
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#### DOUBLE $VA_IW[31]

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<tr>
<td>The variable $VA_IW[ax]$ determines the encoder position of an axis retransformed into the WCS. The WCS value contains all axial override components (DRF, AA_OFF, ext. zero offset etc.) and offset values (CEC etc.). For performance reasons, the positions are only calculated once in each IPO cycle. The variable does not change its value when it is read within an IPO cycle, although the actual value could have changed. When transformations are active, it must be noted that the transformation of the actual values into the BCS can be very time-consuming in the IPO cycle. An adequately long IPO cycle must be set in this case.</td>
<td></td>
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<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>NCK version:</td>
<td>71.00.00</td>
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axis identifier: | GEOAX | CHANAX | MACHAX | SPINDLE |

unit: | Linear / angular position |
<table>
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<tbody>
<tr>
<td>run-in</td>
<td>main run</td>
</tr>
<tr>
<td>read:</td>
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<td>write:</td>
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attributes: | global | block search | link |
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</table>
### System Variable

#### 1.25 Axial System Variables

<table>
<thead>
<tr>
<th>DOUBLE</th>
<th>$VA_{IB}[31]$</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>The variable $VA_{IB}[ax]$ determines the encoder position of an axis retransformed into the BCS. The BCS value contains all axial override components (DRF, AA_OFF, ext. zero offset etc.) and offset values (CEC etc.). For performance reasons, the positions are calculated only once in each IPO cycle. The variable does not change its value when it is read within an IPO cycle, although the actual value could have changed. When transformations are active, it must be noted that the transformation of the actual values into the BCS can be very time-consuming in the IPO cycle. An adequately long IPO cycle must be set in this case.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>GEOAX</th>
<th>CHANAX</th>
<th>MACHAX</th>
<th>SPINDLE</th>
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<tbody>
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<td>NCK Version</td>
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<table>
<thead>
<tr>
<th>Unit</th>
<th>Linear / Angular Position</th>
<th>Min.:</th>
<th>Max.:</th>
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<tbody>
<tr>
<td>Run-In</td>
<td>Main Run</td>
<td>Run-In Stop</td>
<td>Mrun Syn</td>
</tr>
<tr>
<td>Read</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Write</td>
<td></td>
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<table>
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<th>Link</th>
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<tbody>
<tr>
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<td>Not Classified</td>
<td>Not Classified</td>
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### System Variable

#### 1.25 Axial System Variables

<table>
<thead>
<tr>
<th>DOUBLE</th>
<th>$VA_{IBC}[31]$</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>The variable $VA_{IBC}[&lt;Geo-Axis&gt;] determines the encoder position of a cartesian axis lying between the BCS and MCS. &quot;Cartesian&quot; means that the axis is a linear axis which lies plane-parallel to a coordinate axis in a clockwise coordinate system. The axis identifier used can be a geometry, channel or machine axis identifier. This identifier must represent a geometry axis in the BCS, otherwise the variable returns the value 0.0. For performance reasons, the positions are calculated only once in each IPO cycle. The variable does not change its value when it is read within an IPO cycle, although the actual value could have changed. When transformations are active, it must be noted that the transformation of the actual values into the BCS can be very time-consuming in the IPO cycle. An adequately long IPO cycle must be set in this case.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>GEOAX</th>
<th>CHANAX</th>
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<table>
<thead>
<tr>
<th>Unit</th>
<th>Linear / Angular Position</th>
<th>Min.:</th>
<th>Max.:</th>
</tr>
</thead>
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<tr>
<td>Run-In</td>
<td>Main Run</td>
<td>Run-In Stop</td>
<td>Mrun Syn</td>
</tr>
<tr>
<td>Read</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Write</td>
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### DOUBLE $VA_{ITR}[31].MAX CONCATENATE D\_TRAfos$

<table>
<thead>
<tr>
<th>Description:</th>
<th>The axial variable $VA_{ITR}[ax,n]$ determines the current encoder position of an axis at the output of the nth chained transformation. The following applies to the data of the transformation layer: Transformation layer 0: The positions correspond to the BCS positions, that means $VA_{ITR}[x,0]$ corresponds to $VA_{IB}[x]$. Transformation layer 1: Position setpoint of the axis at the output of the 1st transformation. Transformation layer 2: Position setpoint of the axis at the output of the 2nd transformation. Transformation layer 3: Position setpoint of the axis at the output of the 3rd transformation. Transformation layer 4: Position setpoint of the axis at the output of the 4th transformation, that means $VA_{ITR}[x,4]$ corresponds to $VA_{IM}[x]$. If the transformation chain does not consist of 4 single transformations, then the highest layers return the same setpoint values. When transformations are active, it must be noted that the transformation of the actual values into the BCS can be very time-consuming in the IPO cycle. An adequately long IPO cycle must be set in this case.</th>
</tr>
</thead>
<tbody>
<tr>
<td>to be defined</td>
<td>to be defined</td>
</tr>
<tr>
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<td>GEOAX CHANAX MACHAX SPINDLE</td>
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<tr>
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<td>71.00.00</td>
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<tr>
<td>unit:</td>
<td>Linear / angular position</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
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<td>global</td>
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## 1.26 Safety Integrated

### INT $A\_STOPESI$

<table>
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<tr>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$A_STOPESI$</td>
</tr>
</tbody>
</table>

Current Safety Integrated Stop E for any axis:

Val. 0: No Stop E
Value not 0: For one of the axes, a Stop E is currently active

<table>
<thead>
<tr>
<th>Axis identifier:</th>
</tr>
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<tbody>
<tr>
<td>NCK version: 48.00.00</td>
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<table>
<thead>
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<th>INT_MAX</th>
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<td>min.: -</td>
<td>max.: INT_MAX</td>
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<table>
<thead>
<tr>
<th>Read:</th>
<th>Write:</th>
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<tbody>
<tr>
<td>X X X</td>
<td>X X X X</td>
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<th>Attributes:</th>
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### BOOL $A\_INSE [SF\_MAXNUM\_DIG\_EXT\_1NBITS]$

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<th>Description:</th>
</tr>
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<tbody>
<tr>
<td>$A_INSE[n]$</td>
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n = bit number (1...64)

External NCK SPL input signal
NCK SPL interface for SPL control signal I/O interface logic

<table>
<thead>
<tr>
<th>Description of field limits:</th>
</tr>
</thead>
<tbody>
<tr>
<td>n: Number of input 1 - ...</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Axis identifier:</th>
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<tbody>
<tr>
<td>NCK version: 10.00.00</td>
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<table>
<thead>
<tr>
<th>Unit: FALSE</th>
<th>TRUE</th>
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<tbody>
<tr>
<td>min.:</td>
<td>max.:</td>
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</table>

<table>
<thead>
<tr>
<th>Read:</th>
<th>Write:</th>
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</thead>
<tbody>
<tr>
<td>X X X</td>
<td>X X X X</td>
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### INT

<table>
<thead>
<tr>
<th>Description</th>
<th>$A_\text{INSED}[SF\text{_MAXNUM_DIG_EXT_INWORDS}]$</th>
</tr>
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</table>

$n = \text{doubleword number (1,2)}$

External NCK SPL input signals (32-bit)
NCK SPL interface for SPL control signal I/O interface logic

<table>
<thead>
<tr>
<th>Description of Field Limits</th>
<th>$n$: Number of input word 1 - ...</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>NCK Version: 10.00.00</th>
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</table>

<table>
<thead>
<tr>
<th>Run-In</th>
<th>Main Run</th>
<th>Run-In Stop</th>
<th>MRun Syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>Access Rights</th>
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<tr>
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<td>Main Run</td>
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<td>MRun Syn</td>
<td>PP</td>
<td>SA</td>
<td>OPI</td>
<td>OEM</td>
<td>Access Rights</td>
</tr>
<tr>
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<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Write:</td>
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### BOOL

<table>
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<th>$A_\text{INSEP}[SF\text{_MAXNUM_DIG_EXT_INBITS}]$</th>
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</table>

$n = \text{bit number (1...64)}$

Image of an external PLC SPL input signal
PLC SPL interface for SPL control signal I/O interface logic

Readable only during the SPL start-up phase

<table>
<thead>
<tr>
<th>Description of Field Limits</th>
<th>$n$: Number of input 1 - ...</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>NCK Version: 10.00.00</th>
</tr>
</thead>
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<tr>
<th>Run-In</th>
<th>Main Run</th>
<th>Run-In Stop</th>
<th>MRun Syn</th>
<th>PP</th>
<th>SA</th>
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<tbody>
<tr>
<td>Run-In</td>
<td>Main Run</td>
<td>Run-In Stop</td>
<td>MRun Syn</td>
<td>PP</td>
<td>SA</td>
<td>OPI</td>
<td>OEM</td>
<td>Access Rights</td>
</tr>
<tr>
<td>Read:</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Write:</td>
<td></td>
<td></td>
<td></td>
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<tbody>
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### $A_INSEPD[SF_MAXNUM_DIG_EX\_T_INWORDS]$  
**Description:**

$n = \text{doubleword number (1,2)}$

Image of external PLC SPL input signals (32-bit)
PLC SPL interface for SPL control signal I/O interface logic

Readable only during the SPL start-up phase

**Description of Field Limits:**

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<td>runin stp</td>
<td>Mrun syn</td>
<td>PP</td>
<td>SA</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td></td>
<td></td>
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<tr>
<td>Attributes:</td>
<td>global</td>
<td>block search</td>
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</tr>
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<td>rights:</td>
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<td>Not classified</td>
<td></td>
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<td></td>
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</table>

### $A_OUTSE[SF_MAXNUM_DIG_EXT\_OUTBITS]$  
**Description:**

$n = \text{bit number (1...64)}$

External NCK SPL output signal
NCK SPL interface for SPL status signal I/O interface logic

Can be written only from SPL (SAFE.SPF program)

**Description of Field Limits:**

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<thead>
<tr>
<th>n: Number of output 1 - ...</th>
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<table>
<thead>
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<th>Axis Identifier</th>
<th>NCK Version</th>
<th>UNIT</th>
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<th>Access Rights</th>
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<tr>
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<td>runin stp</td>
<td>Mrun syn</td>
<td>PP</td>
<td>SA</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Attributes:</td>
<td>global</td>
<td>block search</td>
<td>link</td>
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<td>rights:</td>
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<td>Not classified</td>
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### INT: $A\_OUTSED[SF\_MAXNUM\_DIG\_EX\_T\_OUTWORDS]$

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<tr>
<th>n</th>
<th>Description</th>
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</thead>
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| $A\_OUTSED[n]$ | n = doubleword number (1,2)  
External NCK SPL output signals (32-bit)  
NCK SPL interface for SPL status signal I/O interface logic  
Can be written only from SPL (SAFE.SPF program) |

#### Field limits:
- **n**: Number of output word 1 - ...

#### Axis identifier:
- **NCK version**: 10.00.00

#### Unit:
- **run-in**, **main run**, **runin slip**, **Mrun syn**: INT_MIN
- **PP**, **SA**, **OPT**, **OEM**: INT_MAX

#### Rights:
- **read**: XXX XXXX  
- **write**: XXX XX X7

#### Attributes:
- **global**, **block search**, **link**  
- Not classified, Not classified

### BOOL: $A\_OUTSEP[SF\_MAXNUM\_DIG\_EX\_T\_OUTBITS]$

<table>
<thead>
<tr>
<th>n</th>
<th>Description</th>
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</thead>
</table>
| $A\_OUTSEP[n]$ | n = bit number (1...64)  
Image of an external PLC SPL output signal  
PLC SPL interface for SPL status signal I/O interface logic  
Readable only during the SPL start-up phase |

#### Field limits:
- **n**: Number of output 1 - ...

#### Axis identifier:
- **NCK version**: 10.00.00

#### Unit:
- **run-in**, **main run**, **runin slip**, **Mrun syn**: FALSE
- **PP**, **SA**, **OPT**, **OEM**: TRUE

#### Rights:
- **read**: XXX XXXX  
- **write**: XXX XX X7

#### Attributes:
- **global**, **block search**, **link**  
- Not classified, Not classified
### INT $A\_OUTSEPD[SF\_MAXNUM\_DIG\_E\_XT\_OUTWORDS]$

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<tr>
<th>Description:</th>
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<tbody>
<tr>
<td>$A_OUTSEPD[n]$</td>
<td>Image of external PLC SPL output signals (32-bit)</td>
</tr>
<tr>
<td>n = doubleword number (1,2)</td>
<td>PLC SPL interface for SPL status signal I/O interface logic</td>
</tr>
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#### Description of Field Limits

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<tr>
<td>run-in</td>
<td>main run</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td></td>
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<table>
<thead>
<tr>
<th>Attributes:</th>
<th>block search</th>
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</tr>
</thead>
<tbody>
<tr>
<td>access rights:</td>
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</table>

### BOOL $A\_INSI[SF\_MAXNUM\_DIG\_INT\_IN\_BITS]$

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<tr>
<th>Description:</th>
<th>Internal NCK SPL input signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>$A_INSI[n]$</td>
<td>Interface to the status signals of the axial NCK monitoring channels</td>
</tr>
<tr>
<td>n = bit number (1...64)</td>
<td></td>
</tr>
</tbody>
</table>

#### Description of Field Limits

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<tr>
<th>Axis Identifier:</th>
<th>NCK version:</th>
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<tr>
<td>run-in</td>
<td>main run</td>
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<td>read:</td>
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### INT

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<td>$A_INSID[n]$</td>
</tr>
<tr>
<td>n = doubleword number (1,2)</td>
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Internal NCK SPL input signals (32-bit)

Interface to the status signals of the axial NCK monitoring channels

<table>
<thead>
<tr>
<th>Description of field limits:</th>
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<tbody>
<tr>
<td>n: Number of input word 1 - ...</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>NCK version:</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in main run runin slip Mrun syn PP SA OPI OEM access rights</td>
<td>10.00.00</td>
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<table>
<thead>
<tr>
<th>read:</th>
<th>write:</th>
</tr>
</thead>
<tbody>
<tr>
<td>X X X</td>
<td>X X X X</td>
</tr>
</tbody>
</table>

| attributes: | |
|-------------||
| global block search link | Not classified |

### BOOL

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<th>Description:</th>
<th>$A_INSIP[$SF_MAXNUM_DIG_INT_INNBITS$]</th>
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</thead>
<tbody>
<tr>
<td>description:</td>
<td>$A_INSIP[n]$</td>
</tr>
<tr>
<td>n = bit number (1...64)</td>
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</table>

Image of an internal PLC SPL input signal

Interface to the status signals of the axial drive monitoring channels

Readable only during the SPL start-up phase

<table>
<thead>
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<th>Description of field limits:</th>
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<tbody>
<tr>
<td>n: Number of input 1 - ...</td>
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<table>
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<tr>
<th>axis identifier:</th>
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<thead>
<tr>
<th>read:</th>
<th>write:</th>
</tr>
</thead>
<tbody>
<tr>
<td>X X X</td>
<td>X X X X</td>
</tr>
</tbody>
</table>

| attributes: | |
|-------------||
| global block search link | Not classified |
**SINUMERIK 840D sl/840Di sl/ 840D/ 840Di, List of System Variables (PGA1), 01/2008**

**1 System variable**

**1.26 Safety Integrated**

---

### INT

**$A_INSIPD [SF_MAXNUM_DIG_INT_ [INWORDS]]**

description:

$A_INSIPD[n]

n = doubleword number (1,2)

Image of internal PLC SPL input signals (32-bit)

Interface to the status signals of the axial drive monitoring channels

Readable only during the SPL start-up phase

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>NCK version:</th>
<th>10.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>min.:</td>
<td>INT_MIN</td>
<td>INT_MAX</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin stp</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
</tr>
<tr>
<td></td>
<td>Not classified</td>
<td>Not classified</td>
</tr>
</tbody>
</table>

### BOOL

**$A_OUTSI [SF_MAXNUM_DIG_INT_ [OUTBITS]]**

description:

$A_OUTSI[n]

n = bit number (1...64)

Internal NCK SPL output signal

Interface to the control signals of the axial NCK monitoring channels

Can be written only from SPL (SAFE.SPF program)

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>NCK version:</th>
<th>10.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>min.:</td>
<td>FALSE</td>
<td>TRUE</td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin stp</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
</tr>
<tr>
<td></td>
<td>Not classified</td>
<td>Not classified</td>
</tr>
</tbody>
</table>
### $A\_OUTSID\{SF\_MAXNUM\_DIG\_INT\_OUTWORDS\}$

**Description:**

$A\_OUTSID[n]$

$n = \text{doubleword number (1,2)}$

Internal NCK SPL output signals (32-bit)

Interface to the control signals of the axial NCK monitoring channels

Can be written only from SPL (SAFE.SPF program)

**Description of Field Limits:**

- **n**: Number of output word 1 - ...

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>NCK Version</th>
<th>Read</th>
<th>Write</th>
<th>Attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>10.00.00</td>
<td>X</td>
<td>X</td>
<td>global</td>
</tr>
</tbody>
</table>

**Unit:** INT

**Run-in:** main run, runin slp, Mrun syn

**Access Rights:**

- **PP**: read: XXX, write: XXX
- **SA**: read: XXX, write: X
- **OPT**: read: XXX, write: X
- **OEM**: read: XXX, write: X

### $A\_OUTSIP\{SF\_MAXNUM\_DIG\_INT\_OUTBITS\}$

**Description:**

$A\_OUTSIP[n]$

$n = \text{bit number (1...64)}$

Image of an internal PLC SPL output signal

Interface to the control signals of the axial drive monitoring channels

Readable only during the SPL start-up phase

**Description of Field Limits:**

- **n**: Number of output 1 - ...

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>NCK Version</th>
<th>Read</th>
<th>Write</th>
<th>Attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>10.00.00</td>
<td>X</td>
<td>X</td>
<td>global</td>
</tr>
</tbody>
</table>

**Unit:** BOOL

**Run-in:** main run, runin slp, Mrun syn

**Access Rights:**

- **PP**: read: XXX, write: X
- **SA**: read: XXX, write: X
- **OPT**: read: XXX, write: X
- **OEM**: read: XXX, write: X

**Attributes:**

- global: block search, link
- Not classified: Not classified
### $A\_OUTSIPD\{SF\_MAXNUM\_DIG\_INT\_OUTWORDS\}$

**Description:**

$n = \text{doubleword number } (1,2)$

Image of internal PLC SPL output signals (32-bit)

Interface to the control signals of the axial drive monitoring channels

Readable only during the SPL start-up phase

**Description of Field Limits:**

$n$: Number of output word 1 - ...

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>NCK Version</th>
<th>Run-in</th>
<th>Main Run</th>
<th>Runin Stop</th>
<th>Mrun Syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10.00.00</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

**Attributes:**

- Global
- Block Search
- Link

Not classified

### $A\_MARKERSI\{SF\_MAXNUM\_MARKER\}$

**Description:**

$n = \text{bit number } (1...64)$

NCK SPL flags

Can be written only from SPL (SAFE.SPF program)

**Description of Field Limits:**

$n$: Number of flag 1 - ...

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>NCK Version</th>
<th>Run-in</th>
<th>Main Run</th>
<th>Runin Stop</th>
<th>Mrun Syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>Access Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10.00.00</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

**Attributes:**

- Global
- Block Search
- Link

Not classified
### INT $A\_MARKERSID[SF\_MAXNUM\_MARKER\_WORDS]$

**Description:**

$A\_MARKERSID[n]$

n = doubleword number (1,2)

NCK SPL flag word (32-bit)

Can be written only from SPL (SAFE.SPF program)

**Description of Field Limits:**

n: Number of flag word 1 - ...

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>INT_MIN</th>
<th>INT_MAX</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>-</td>
<td>n</td>
</tr>
<tr>
<td>main run</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>runin stp</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Mrun syn</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>PP</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>SA</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>OPI</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>OEM</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>access rights</td>
<td>XXX XXXX</td>
<td>XXX XXXX</td>
</tr>
</tbody>
</table>

**Attributes:**

- global
- block
- search
- link

- Not classified
- Not classified

### BOOL $A\_MARKERSIP[SF\_MAXNUM\_MARKER]$  

**Description:**

$A\_MARKERSIP[n]$

n = bit number (1...64)

Image of a PLC SPL flag

Readable only during the SPL start-up phase

**Description of Field Limits:**

n: Number of flag 1 - ...

<table>
<thead>
<tr>
<th>Axis Identifier</th>
<th>FALSE</th>
<th>TRUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>main run</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>runin stp</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Mrun syn</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>PP</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>SA</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>OPI</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>OEM</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>access rights</td>
<td>XXX XXXX</td>
<td>XXX XXXX</td>
</tr>
</tbody>
</table>

**Attributes:**

- global
- block
- search
- link

- Not classified
- Not classified
### INT $\$A$-_MARKERSIPD[SF_MAXNUM_M ARKER_WORDS]

**description:**

$\$A$-_MARKERSIPD[n]

*n* = doubleword number (1,2)

Image of a PLC SPL flag word (32-bit)

**Reade**able only during the SPL start-up phase

**description of field limits:**

*n*: Number of flag word 1 - ...

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>NCK version: 13.09.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>INT_MIN</td>
</tr>
<tr>
<td>main run</td>
<td>INT_MAX</td>
</tr>
<tr>
<td>runin stp</td>
<td>PP</td>
</tr>
<tr>
<td>Mrun syn</td>
<td>SA</td>
</tr>
<tr>
<td>PP</td>
<td>OPI</td>
</tr>
<tr>
<td>OEM</td>
<td>access rights</td>
</tr>
</tbody>
</table>

**read:** X X X X X X

**write:**

<table>
<thead>
<tr>
<th>attributes: global block search link</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not classified</td>
</tr>
<tr>
<td>Not classified</td>
</tr>
</tbody>
</table>

### DOUBLE $\$A$-_TIMERSI[SF_MAXNUM_TIMER]

**description:**

$\$A$-_TIMERSI[n]

*n* = timer number (1...16)

SPL timers

Unit in seconds

The time is counted internally in multiples of the interpolation cycle.

Incrementation of the time variable is started by value assignment

$\$A$-_TIMERSI[n]=$<start value>$

Incrementation of a time variable is stopped through assignment of a negative value

$\$A$-_TIMERSI[n]=-1

The current timer count can be read while the time variable is running or stopped. When the time variable is stopped by assigning -1, the last count value remains stored in the variable and can continue to be read. The timers are not stopped by a channel/mode group reset.

**description of field limits:**

*n*: Number of timer 1 - ...

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>NCK version: 10.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>DBL_MIN</td>
</tr>
<tr>
<td>main run</td>
<td>DBL_MAX</td>
</tr>
<tr>
<td>runin stp</td>
<td>PP</td>
</tr>
<tr>
<td>Mrun syn</td>
<td>SA</td>
</tr>
<tr>
<td>PP</td>
<td>OPI</td>
</tr>
<tr>
<td>OEM</td>
<td>access rights</td>
</tr>
</tbody>
</table>

**read:** X X X X X X X

**write:** X X X X X 7

<table>
<thead>
<tr>
<th>attributes: global block search link</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not classified</td>
</tr>
<tr>
<td>Not classified</td>
</tr>
</tbody>
</table>
### $A\_STATSID

**Description:**
Status of data cross-check between NCK and PLC (SPL DCC).

- **Meaning:**
  - Bit 0 ... 27: DCC error in input/output signals or flags
  - Bit 28: DCC error "SPL protection status" ($MN\_PREVENT\_SYNACT\_LOCK status not equal to DB18.DBX36.0 (SPL READY))
  - Bit 29: Time error during communications between NCK and PLC (all ext. NCK SPL outputs are set to zero in 5 sec. and the PLC switches to Stop)
  - Bit 30: Stop signaled from PLC to NCK

**Type:** INT

<table>
<thead>
<tr>
<th>Description</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>$A_STATSID</td>
<td>Status of data cross-check between NCK and PLC (SPL DCC). If the value does not equal zero, an error has occurred in the SPL DCC.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>axis identifier: NCK version: 13.03.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>INT_MIN</td>
</tr>
<tr>
<td>run-in</td>
</tr>
<tr>
<td>read: X</td>
</tr>
<tr>
<td>write:</td>
</tr>
</tbody>
</table>

**Attributes:**
- Global
- Block search
- Link

**BOOL $A\_CMDI[n]$:SF\_MAXNUM\_CMD\_MASTER**

**Description:**
Control word for data cross-check between NCK and PLC (SPL DCC).

- **n = bit number (1..0.16)**
- **n = 1**: Increase time for signal change monitoring to 10 s.
- **Can be written only from SPL (SAFE.SPF program)**

**Type:** BOOL

<table>
<thead>
<tr>
<th>Description</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>$A_CMDI[n]$</td>
<td>Control word for data cross-check between NCK and PLC (SPL DCC).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>axis identifier: NCK version: 13.03.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>FALSE</td>
</tr>
<tr>
<td>run-in</td>
</tr>
<tr>
<td>read: X</td>
</tr>
<tr>
<td>write: X</td>
</tr>
</tbody>
</table>

**Attributes:**
- Global
- Block search
- Link

**Not classified**
### $A\_LEVELSID

**description:**

$A\_LEVELSID$

Displays the fill level for signal change monitoring during data cross-check between NCK and PLC SPL (SPL DCC).

Specifies the number of signals currently tagged for cross-checking.

The value is already zero if an SPL signal has different levels on the NCK and PLC but the allowed discrepancy time for the signals (2 sec) has not yet expired.

| axis identifier: NCK version: |
|-----------------------------|------------------|
| -                           | 13.03.00         |

| unit: axis identifier: run-in main run run in slip Mrun syn PP SA OPI OEM access rights |
|-----------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| INT_MIN                      | INT_MAX          |
| read:                        | write:           |
| X                            | X                |
| X                            | X                |
| X                            | X                |
| X                            | X                |
| X                            | X                |

<table>
<thead>
<tr>
<th>attributes: global block search link</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not classified</td>
</tr>
<tr>
<td>Not classified</td>
</tr>
</tbody>
</table>

### $A\_XFAULTSI

**description:**

$A\_XFAULTSI$

Information on Stop F for a safety axis:

- Bit 0 = 1: An actual value error has been detected by the data cross-check between NCK and SIMODRIVE 611D for any safety axis.
- Bit 1 = 1: Any error on any axis has been detected by the data cross-check between NCK and SIMODRIVE 611D, and the waiting time before triggering Stop B on that axis is running or has expired ($MA\_SAFE\_STOP\_SWITCH\_TIME\_F$).

| axis identifier: NCK version: |
|-----------------------------|------------------|
| -                           | 45.00.00         |

| unit: axis identifier: run-in main run run in slip Mrun syn PP SA OPI OEM access rights |
|-----------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| -                           | 0                | max.:            | 3                |

| read:                        | write:           |
| X                            | X                |
| X                            | X                |
| X                            | X                |
| X                            | X                |
| X                            | X                |

<table>
<thead>
<tr>
<th>attributes: global block search link</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not classified</td>
</tr>
<tr>
<td>Not classified</td>
</tr>
</tbody>
</table>
### BOOL \$A\_PLCSIIN[SF\_MAXNUM\_PLCIN\_MARKER]

**description:**
\$A\_PLCSIIN[n]

n = bit number (1..0.32)

Single-channel signals from PLC SPL (DB18) to NCK SPL.

**Application:**
\$A\_MARKERSI[1] = \$A\_PLCSIIN[1] ; Signal from PLC-SPL

**description of field limits:**
n: Number of signal 1 - ... from PLC to NCK

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>-</th>
<th>min.:</th>
<th>FALSE</th>
<th>max.:</th>
<th>TRUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>main run</td>
<td>run-in slp</td>
<td>Mrun syn</td>
<td>PP</td>
<td>SA</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
<td>link</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Not classified</td>
<td>Not classified</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### BOOL \$A\_PLCSIOUT[SF\_MAXNUM\_PLCOUT\_MARKER]

**description:**
\$A\_PLCSIOUT[n]

n = bit number (1..0.32)

Single-channel signals from NCK SPL to PLC SPL (DB18).

**Application:**
\$A\_PLCSIOUT[1] = \$A\_MARKERSI[1] ; Signal to PLC-SPL

Can be written only from SPL (SAFE.SPF program)

**description of field limits:**
n: Number of signal 1 - ... from NCK to PLC

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>-</th>
<th>min.:</th>
<th>FALSE</th>
<th>max.:</th>
<th>TRUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>main run</td>
<td>run-in slp</td>
<td>Mrun syn</td>
<td>PP</td>
<td>SA</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
<td>link</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not classified</td>
<td>Not classified</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### 1 System variable

#### 1.26 Safety Integrated

<table>
<thead>
<tr>
<th>INT</th>
<th>$A_FSDP_ERR_REAC{SF_MAXNU_M_FSENDDP_DRIVER}</th>
</tr>
</thead>
<tbody>
<tr>
<td>description:</td>
<td>The system variable sets the response to the occurrence of a communications error. The response to a communications error caused by a fault in the communication path or by the intentional switching off one of the system components can be specifically defined according to the current dependency of the two system components involved in the F_DP communication relationship.</td>
</tr>
<tr>
<td>$A_FSDP_ERR_REAC[k]$</td>
<td>$n = F_SENDDP relationship (1,2,3)$</td>
</tr>
<tr>
<td>$0 =$</td>
<td>Alarm 27350 + stop D/E</td>
</tr>
<tr>
<td>$1 =$</td>
<td>Alarm 27350</td>
</tr>
<tr>
<td>$2 =$</td>
<td>Alarm 27351 (display only, self-clearing)</td>
</tr>
<tr>
<td>$3 =$</td>
<td>No alarm displayed</td>
</tr>
<tr>
<td>description of field limits:</td>
<td>to be defined</td>
</tr>
<tr>
<td>axis identifier:</td>
<td>NCK version: 72.00.00</td>
</tr>
<tr>
<td>unit:</td>
<td>run-in main run runin stp Mrun syn PP SA OPI OEM access rights</td>
</tr>
<tr>
<td>read:</td>
<td>X X X X X X X</td>
</tr>
<tr>
<td>write:</td>
<td>X X X X X X 7</td>
</tr>
<tr>
<td>attributes:</td>
<td>Not classified Not classified</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BOOL</th>
<th>$A_FSDP_ERROR{SF_MAXNUM_FSENDDP_DRIVER}</th>
</tr>
</thead>
<tbody>
<tr>
<td>description:</td>
<td>The system variable indicates whether there is a communications error. The cause of the error determined by F_SENDDP is contained in the diagnostic data $A_FSDP_DIAG$.</td>
</tr>
<tr>
<td>$A_FSDP_ERROR[k]$</td>
<td>$n = F_SENDDP relationship (1,2,3)$</td>
</tr>
<tr>
<td>TRUE =</td>
<td>Communications error</td>
</tr>
<tr>
<td>FALSE =</td>
<td>Normal operation</td>
</tr>
<tr>
<td>description of field limits:</td>
<td>to be defined</td>
</tr>
<tr>
<td>axis identifier:</td>
<td>NCK version: 72.00.00</td>
</tr>
<tr>
<td>unit:</td>
<td>run-in main run runin stp Mrun syn PP SA OPI OEM access rights</td>
</tr>
<tr>
<td>read:</td>
<td>X X X X X X X</td>
</tr>
<tr>
<td>write:</td>
<td>X X X X X X</td>
</tr>
<tr>
<td>attributes:</td>
<td>Not classified Not classified</td>
</tr>
</tbody>
</table>
### BOOL

$A\_\text{FSDP\_SUBS\_ON}[\text{SF\_MAXNUM}\_\text{FSE\_NDPP\_DRIVER}]$

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$A_\text{FSDP_SUBS_ON}[n]$</td>
</tr>
<tr>
<td>$n = \text{F_SENDPP}$ relationship (1,2,3)</td>
</tr>
</tbody>
</table>

The system variable states whether substitution values at the F\_RECVDP (receiver) are output to the application.

- TRUE = Output of substitution values
- FALSE = Output of process values

#### Description of Field Limits:

<table>
<thead>
<tr>
<th>Axis Identifier:</th>
<th>NCK Version:</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>72.00.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit:</th>
<th>Min.:</th>
<th>Max.:</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>FALSE</td>
<td>TRUE</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Read:</th>
<th>Write:</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

#### Attributes:

- Global
- Block search
- Sink

- Not classified

---

### INT

$A\_\text{FSDP\_DIAG}[\text{SF\_MAXNUM}\_\text{FSE\_NDPP\_DRIVER}]$

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$A_\text{FSDP_DIAG}[n]$</td>
</tr>
<tr>
<td>$n = \text{F_SENDPP}$ relationship (1,2,3)</td>
</tr>
</tbody>
</table>

The system variable indicates the cause of the communications error determined by F\_SENDPP.

- Bits 0 - 3: reserved
- Bit 4: 1 = Timeout detected
- Bit 5: 1 = Sequence number error detected
- Bit 6: 1 = CRC error detected
- Bits 7 - 30: reserved
- Bit 31: 1 = F\_DP-NCK detects error state of F\_DP-PLC

#### Description of Field Limits:

<table>
<thead>
<tr>
<th>Axis Identifier:</th>
<th>NCK Version:</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>72.00.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit:</th>
<th>Min.:</th>
<th>Max.:</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>0</td>
<td>8070H</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Read:</th>
<th>Write:</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

#### Attributes:

- Global
- Block search
- Sink

- Not classified

---
### 1.26 Safety Integrated

**IN1 $A_FRDP_SUBS[SF_MAXNUM_FR ECVDVP_DRIVER]**

<table>
<thead>
<tr>
<th>description:</th>
<th>$A_FRDP_SUBS[n]</th>
</tr>
</thead>
<tbody>
<tr>
<td>n = F_RECVDP relationship (1,2,3)</td>
<td></td>
</tr>
</tbody>
</table>

The system variable defines the substitution values output to the SPL in the following states:

- Start of cyclic communication
- Communications error

**description of field limits:**

to be defined

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>NCK version:</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>72.00.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>unit:</th>
<th>min.:</th>
<th>max.:</th>
<th>run-in</th>
<th>main run</th>
<th>runin stp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>0</td>
<td>FFFFH</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>read:</th>
<th>write:</th>
<th>attributes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
<td>global</td>
</tr>
<tr>
<td>X</td>
<td>X</td>
<td>search</td>
</tr>
<tr>
<td>X</td>
<td>X</td>
<td>link</td>
</tr>
<tr>
<td>X</td>
<td>X</td>
<td>link</td>
</tr>
<tr>
<td>X</td>
<td>X</td>
<td>link</td>
</tr>
</tbody>
</table>

Not classified Not classified

### IN1 $A_FRDP_ERR_REAC[SF_MAXNUM M_RECVDP_DRIVER]$

<table>
<thead>
<tr>
<th>description:</th>
<th>$A_FRDP_ERR_REAC[n]</th>
</tr>
</thead>
<tbody>
<tr>
<td>n = F_RECVDP relationship (1,2,3)</td>
<td></td>
</tr>
</tbody>
</table>

The system variable sets the response to the occurrence of a communications error. The response to a communications error caused by a fault in the communication path or by the intentional switching off one of the system components can be specifically defined according to the current dependency of the two system components involved in the F_DP communication relationship.

- 0 = Alarm 27350 + stop D/E
- 1 = Alarm 27350
- 2 = Alarm 27351 (display only, self-cleaning)
- 3 = No alarm displayed

**description of field limits:**

to be defined

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>NCK version:</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>72.00.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>unit:</th>
<th>min.:</th>
<th>max.:</th>
<th>run-in</th>
<th>main run</th>
<th>runin stp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>0</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>read:</th>
<th>write:</th>
<th>attributes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
<td>global</td>
</tr>
<tr>
<td>X</td>
<td>X</td>
<td>search</td>
</tr>
<tr>
<td>X</td>
<td>X</td>
<td>link</td>
</tr>
<tr>
<td>X</td>
<td>X</td>
<td>link</td>
</tr>
<tr>
<td>X</td>
<td>X</td>
<td>link</td>
</tr>
<tr>
<td>X</td>
<td>X</td>
<td>link</td>
</tr>
</tbody>
</table>

Not classified Not classified
### BOOL \$A\_FRDP\_ERROR[SF\_MAXNUM\_F\_RECVDP\_DRIVER]

<table>
<thead>
<tr>
<th>description:</th>
</tr>
</thead>
</table>
| \$A\_FRDP\_ERROR[n]  
\n\n\n\n\n\nn = F\_RECVDP relationship (1,2,3)  
\n\nThe system variable indicates whether there is a communications error. The cause of the error determined by F\_RECVDP is contained in the diagnostic data \$A\_FRDP\_DIAG.  
\n\nTRUE = communications error  
\nFALSE = Normal operation  
\n\ndescription of field limits:  
\nto be defined  
\naxis identifier:  
NCK version: 72.00.00  
\nunit: -  
min.: FALSE  
max.: TRUE  
\nrun-in main run runin stp Mrun syn PP SA OPT OEM access  
read: X X X X X X X X  
write:  
attributes: global block search link  
\nNot classified Not classified  

### BOOL \$A\_FRDP\_SUBS\_ON[SF\_MAXNUM\_FSENDDP\_DRIVER]

<table>
<thead>
<tr>
<th>description:</th>
</tr>
</thead>
</table>
| \$A\_FRDP\_SUBS\_ON[[n]  
\n\n\n\n\n\nn = F\_RECVDP relationship (1,2,3)  
\n\nThe system variable states whether substitution values are output to the application.  
\n\nTRUE = Output of substitution values  
\nFALSE = Output of process values  
\n\ndescription of field limits:  
\nto be defined  
\naxis identifier:  
NCK version: 72.00.00  
\nunit: -  
min.: FALSE  
max.: TRUE  
\nrun-in main run runin stp Mrun syn PP SA OPT OEM access  
read: X X X X X X X X  
write:  
attributes: global block search link  
\nNot classified Not classified
### BOOL $A\_FRDP\_ACK\_REQ(SF\_MAXNUM\_FSENDDP\_DRIVER)$

**Description:**

$A\_FRDP\_ACK\_REQ[n]$

$n = F\_RECVDP$ relationship (1,2,3)

The system variable indicates that, after a communications error F telegrams are again being exchanged cyclically without error, and that user acknowledgement via interface signal DB18.FRDP_ACK_REI or channel_1 reset is still required to acknowledge the error and output the process values.

<table>
<thead>
<tr>
<th>Field Limits</th>
<th>Axis Identifier</th>
<th>NCK Version:</th>
<th>72.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Run-in</td>
<td>Main Main</td>
<td>Min.:</td>
<td>FALSE</td>
</tr>
<tr>
<td>Read</td>
<td>X X X X X X</td>
<td>Write</td>
<td>X</td>
</tr>
<tr>
<td>Attributes</td>
<td>Global</td>
<td>Block</td>
<td>Search</td>
</tr>
<tr>
<td>Rights</td>
<td>Not classified</td>
<td>Not classified</td>
<td>Not classified</td>
</tr>
</tbody>
</table>

### INT $A\_FRDP\_DIAG(SF\_MAXNUM\_FRECVDP\_DRIVER)$

**Description:**

$A\_FRDP\_DIAG[n]$

$n = F\_RECVDP$ relationship (1,2,3)

The system variable indicates the cause of the communications error determined by F_RECVDP.

<table>
<thead>
<tr>
<th>Field Limits</th>
<th>Axis Identifier</th>
<th>NCK Version:</th>
<th>72.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Run-in</td>
<td>Main Main</td>
<td>Min.:</td>
<td>0</td>
</tr>
<tr>
<td>Read</td>
<td>X X X X X X</td>
<td>Write</td>
<td>X</td>
</tr>
<tr>
<td>Attributes</td>
<td>Global</td>
<td>Block</td>
<td>Search</td>
</tr>
<tr>
<td>Rights</td>
<td>Not classified</td>
<td>Not classified</td>
<td>Not classified</td>
</tr>
</tbody>
</table>
### $A_{FRDP\_SENDMODE}[SF\_MAXNU\_M\_FRECVD\_DRIVER]$  

**Description:**

$A_{FRDP\_SENDMODE}[n]$

$n = F\_RECV\_DP$ relationship (1,2,3)

The system variable shows the current mode of the F-CPU of the $F\_SEND\_DP$ communication partner:

- **TRUE** = The F-CPU is in deactivated safety mode
- **FALSE** = The F-CPU is in safety mode

**Description of Field Limits:**

<table>
<thead>
<tr>
<th>Axis Identifier:</th>
<th>NCK Version: 72.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Run-in</td>
<td>Min.: FALSE</td>
</tr>
<tr>
<td>Main Run</td>
<td>Max.: TRUE</td>
</tr>
<tr>
<td>Run-in Main Run</td>
<td></td>
</tr>
<tr>
<td>Run-in Main Run</td>
<td></td>
</tr>
<tr>
<td>Mrun Syn</td>
<td></td>
</tr>
<tr>
<td>PP</td>
<td></td>
</tr>
<tr>
<td>SA</td>
<td></td>
</tr>
<tr>
<td>OPI</td>
<td></td>
</tr>
<tr>
<td>OEM</td>
<td></td>
</tr>
<tr>
<td>Access Rights</td>
<td></td>
</tr>
<tr>
<td>Read</td>
<td>X X X X X</td>
</tr>
<tr>
<td>Write</td>
<td>X X X X X</td>
</tr>
<tr>
<td>Attributes</td>
<td>Global Block Search Link</td>
</tr>
<tr>
<td>Access Rights</td>
<td>Not classified</td>
</tr>
</tbody>
</table>

### $VA_{IS}[31]$  

**Description:**

$VA_{IS}[X]$

$X = axis$ identifier

Safe actual position for NCK monitoring channel

**Description of Field Limits:**

<table>
<thead>
<tr>
<th>Axis Identifier:</th>
<th>NCK Version: 06.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Run-in</td>
<td>Min.: DBL_MIN</td>
</tr>
<tr>
<td>Main Run</td>
<td>Max.: DBL_MAX</td>
</tr>
<tr>
<td>Run-in Main Run</td>
<td></td>
</tr>
<tr>
<td>Run-in Main Run</td>
<td></td>
</tr>
<tr>
<td>Mrun Syn</td>
<td></td>
</tr>
<tr>
<td>PP</td>
<td></td>
</tr>
<tr>
<td>SA</td>
<td></td>
</tr>
<tr>
<td>OPI</td>
<td></td>
</tr>
<tr>
<td>OEM</td>
<td></td>
</tr>
<tr>
<td>Access Rights</td>
<td></td>
</tr>
<tr>
<td>Read</td>
<td>X X X X X</td>
</tr>
<tr>
<td>Write</td>
<td>X X X X X</td>
</tr>
<tr>
<td>Attributes</td>
<td>Global Block Search Link</td>
</tr>
<tr>
<td>Access Rights</td>
<td>Not classified</td>
</tr>
</tbody>
</table>
### $VA_STOPSI[31]

<table>
<thead>
<tr>
<th>description:</th>
<th>$VA_STOPSI[X]</th>
</tr>
</thead>
<tbody>
<tr>
<td>X = axis identifier</td>
<td></td>
</tr>
</tbody>
</table>

Current Safety Integrated Stop for the relevant axis

<table>
<thead>
<tr>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>-1</td>
<td>No Stop</td>
</tr>
<tr>
<td>0</td>
<td>Stop A</td>
</tr>
<tr>
<td>1</td>
<td>Stop B</td>
</tr>
<tr>
<td>2</td>
<td>Stop C</td>
</tr>
<tr>
<td>3</td>
<td>Stop D</td>
</tr>
<tr>
<td>4</td>
<td>Stop E</td>
</tr>
<tr>
<td>5</td>
<td>Stop F</td>
</tr>
<tr>
<td>10</td>
<td>Test Stop NC</td>
</tr>
<tr>
<td>11</td>
<td>Test ext. pulse suppression</td>
</tr>
</tbody>
</table>

#### description of field limits:
- to be defined

#### axis identifier:
- GEOAX
- CHANAX
- MACHAX

#### unit:
- run-in
- main run
- runin stp
- Mrun syn
- PP
- SA
- OPI
- OEM
- access rights

#### read:
- X
- X
- X
- X
- X
- X

#### write:
- Not classified
- Not classified

### $VA_XFAULTSI[31]

<table>
<thead>
<tr>
<th>description:</th>
<th>$VA_XFAULTSI[X]</th>
</tr>
</thead>
<tbody>
<tr>
<td>X = axis identifier</td>
<td></td>
</tr>
</tbody>
</table>

Information about Safety Integrated Stop F for this axis:

Bit 0 set: An actual value error has been detected by the data cross-check between NCK and SIMODRIVE 611D.

Bit 1 set: Any error has been detected by the data cross-check between NCK and SIMODRIVE 611D, and the waiting time before triggering Stop B ($MA_SAFE_STOP_SWITCH_TIME_F) is running or has expired.

#### description of field limits:
- to be defined

#### axis identifier:
- GEOAX
- CHANAX
- MACHAX
- SPINDLE

#### unit:
- run-in
- main run
- runin stp
- Mrun syn
- PP
- SA
- OPI
- OEM
- access rights

#### read:
- X
- X
- X
- X
- X
- X

#### write:
- Not classified
- Not classified
### 1.27 User-specific system variables

**DOUBLE SYG_RM[n]**

**description:**
SYG_RM[n] Synact Real parameters in GUD2 block.
A protection level can be assigned to the parameters with REDEF.
In order to create the parameters, at least four GUD blocks must be activated with MD $MN_MM_NUM_GUD_MODULES.

**description of field limits:**
The maximum number of SynactGUD Real is defined in machine data

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>NCK version:</th>
<th>57.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>attributes:</td>
<td>global block search link</td>
<td>Program sensitive</td>
</tr>
</tbody>
</table>

**INT SYG_IM[n]**

**description:**
SYG_IM[n] Synact Integer parameters in GUD2 block.
A protection level can be assigned to the parameters with REDEF.
In order to create the parameters, at least four GUD blocks must be activated with MD $MN_MM_NUM_GUD_MODULES.

**description of field limits:**
The maximum number of SynactGUD Integers is defined in machine data

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>NCK version:</th>
<th>57.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>unit:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>attributes:</td>
<td>global block search link</td>
<td>Program sensitive</td>
</tr>
</tbody>
</table>
### BOOL SYG_BM[n]

**Description:**
SYG_BM[n] Synact Boolean parameters in GUD2 block.
A protection level can be assigned to the parameters with REDEF.
In order to create the parameters, at least four
GUD blocks must be activated with MD $MN_MM_NUM_GUD_MODULES.

**Description of field limits:**
The maximum number of SynactGUD Boolean parameters is defined in machine data

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>NCK version:</th>
<th>57.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin slp</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
</tr>
<tr>
<td></td>
<td>Program sensitive</td>
<td>No restrictions</td>
</tr>
</tbody>
</table>

### AXIS SYG_AM[n]

**Description:**
SYG_AM[n] Synact axis parameters in GUD2 block.
A protection level can be assigned to the parameters with REDEF.
In order to create the parameters, at least four
GUD blocks must be activated with MD $MN_MM_NUM_GUD_MODULES.

**Description of field limits:**
The maximum number of SynactGUD axis is defined in machine data

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>NCK version:</th>
<th>61.00.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin slp</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
</tr>
<tr>
<td></td>
<td>Program sensitive</td>
<td>No restrictions</td>
</tr>
</tbody>
</table>
### CHAR

<table>
<thead>
<tr>
<th>SYG_CM[n]</th>
<th>description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>SYG_CM[n] Synact char parameters in GUD2 block.</td>
<td></td>
</tr>
<tr>
<td>A protection level can be assigned to the parameters with REDEF.</td>
<td></td>
</tr>
<tr>
<td>In order to create the parameters, at least four GUD blocks must be activated with MD $MN_MM_NUM_GUD_MODULES.</td>
<td></td>
</tr>
</tbody>
</table>

#### description of field limits:

The maximum number of SynactGUD char is defined in machine data

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<tr>
<th>axis identifier:</th>
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</thead>
<tbody>
<tr>
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</tr>
<tr>
<td>main run</td>
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</tr>
<tr>
<td>run in stp</td>
<td></td>
</tr>
<tr>
<td>Mrun syn</td>
<td></td>
</tr>
<tr>
<td>PP</td>
<td>SA</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
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<table>
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<th>global</th>
<th>block</th>
<th>search</th>
<th>link</th>
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<tr>
<td>access rights</td>
<td>Program sensitive</td>
<td>No restrictions</td>
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### STRING

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<td>SYG_SM[n] Synact parameter string in GUD2 block. The maximum string length has been limited to 31 characters.</td>
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<tr>
<td>A protection level can be assigned to the parameters with REDEF.</td>
<td></td>
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<tr>
<td>In order to create the parameters, at least four GUD blocks must be activated with MD $MN_MM_NUM_GUD_MODULES.</td>
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#### description of field limits:

The maximum number of SynactGUD string is defined in machine data

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<td>unit:</td>
<td>min.:</td>
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<tr>
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<td>main run</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
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<table>
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<tbody>
<tr>
<td>access rights</td>
<td>Program sensitive</td>
<td>No restrictions</td>
<td>No restrictions</td>
<td></td>
</tr>
</tbody>
</table>
### SYG_RU[n]

**Description:**
SYG_RU[n] Synact Real parameters in UGUD block.
A protection level can be assigned to the parameters with REDEF.
In order to create the parameters, at least three
gud blocks must be activated with MD $MN_MM_NUM_GUD_MODULES.

**Description of field limits:**
The maximum number of SynactGUD Real is defined in machine data.

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<td>main run</td>
</tr>
<tr>
<td></td>
<td>runin slip</td>
</tr>
<tr>
<td></td>
<td>Mrun syn</td>
</tr>
<tr>
<td></td>
<td>PP</td>
</tr>
<tr>
<td></td>
<td>SA</td>
</tr>
<tr>
<td></td>
<td>OPT</td>
</tr>
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<td></td>
<td>OEM</td>
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<td>access rights</td>
</tr>
<tr>
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<td>X</td>
</tr>
<tr>
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<td>X</td>
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<td>block search</td>
</tr>
<tr>
<td></td>
<td>link</td>
</tr>
<tr>
<td>run-in main run</td>
<td>runin slip Mrun syn</td>
</tr>
<tr>
<td>syn PP SA OPT OEM</td>
<td>access rights</td>
</tr>
<tr>
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<td>attributes:</td>
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<tr>
<td></td>
<td>block search</td>
</tr>
<tr>
<td></td>
<td>link</td>
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### SYG_IU[n]

**Description:**
SYG_IU[n] Synact Integer parameters in UGUD block.
A protection level can be assigned to the parameters with REDEF.
In order to create the parameters, at least three
gud blocks must be activated with MD $MN_MM_NUM_GUD_MODULES.

**Description of field limits:**
The maximum number of SynactGUD Integers is defined in machine data.

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<td>runin slip</td>
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<td>Mrun syn</td>
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<td>PP</td>
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<td>SA</td>
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<td>OPT</td>
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<td>OEM</td>
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</tr>
<tr>
<td>read: X</td>
<td>X</td>
</tr>
<tr>
<td>write: X</td>
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<td>global</td>
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<td>block search</td>
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<td>link</td>
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<tr>
<td>run-in main run</td>
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<tr>
<td></td>
<td>block search</td>
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<tr>
<td></td>
<td>link</td>
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Note: The table entries for run-in, main run, runin, slip, Mrun, syn, PP, SA, OPT, OEM, and access rights are placeholders and should be replaced with actual values.
## BOOL SYG_BU[n]

**Description:**
SYG_BU[n] Synact Boolean parameters in UGUD block.
A protection level can be assigned to the parameters with REDEF.
In order to create the parameters, at least three GUD blocks must be activated with MD $MN_MM_NUM_GUD_MODULES.

**Description of Field Limits:**
The maximum number of SynactGUD Boolean parameters is defined in machine data.

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<tr>
<td>read:</td>
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## Axis SYG_AU[n]

**Description:**
SYG_AU[n] Synact Axis parameters in UGUD block.
A protection level can be assigned to the parameters with REDEF.
In order to create the parameters, at least three GUD blocks must be activated with MD $MN_MM_NUM_GUD_MODULES.

**Description of Field Limits:**
The maximum number of SynactGUD Real is defined in machine data.

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<td>write:</td>
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<td>global</td>
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### 1 System variable

#### 1.27 User-specific system variables

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<td>run-in</td>
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<th>Field limits:</th>
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<th>Runin slip</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>Access rights</th>
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Program sensitive No restrictions

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### INT SYG_I4[n]

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<th>Field limits:</th>
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<th>Runin slip</th>
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<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>Access rights</th>
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<table>
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<tr>
<th>Attributes:</th>
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Program sensitive No restrictions

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### BOOL
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### AXIS
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<td>In order to create the parameters, at least four GUD blocks must be activated with MD $MN_MM_NUM_GUD_MODULES.</td>
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<td>main run: X</td>
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<td>runin slip:</td>
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### CHAR SYG_C4[n]

**description:**
SYG_C4[n] Synact Char parameters in GUD4 block.
A protection level can be assigned to the parameters with REDEF.
In order to create the parameters, at least four GUD blocks must be activated with MD $MN_MM_NUM_GUD_MODULES.

**description of field limits:**
The maximum number of SynactGUD Char is defined in machine data

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<th>runin sfp</th>
<th>Mrun syn</th>
<th>PP</th>
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<th>access rights</th>
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**attributes:**
Program sensitive: No restrictions

### STRING SYG_S4[n]

**description:**
SYG_S4[n] Synact parameter string in GUD4 block. The maximum string length has been limited to 31 characters.
A protection level can be assigned to the parameters with REDEF.
In order to create the parameters, at least four GUD blocks must be activated with MD $MN_MM_NUM_GUD_MODULES.

**description of field limits:**
The maximum number of SynactGUD String is defined in machine data

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Program sensitive: No restrictions
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<td>A protection level can be assigned to the parameters with REDEF.</td>
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**description of field limits:**
The maximum number of SynactGUD Real is defined in machine data

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<th>access rights</th>
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**description of field limits:**
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### BOOL SYG_B5[n]

**Description:**
SYG_B5[n] Synact Boolean parameters in GUD5 block.
A protection level can be assigned to the parameters with REDEF.
In order to create the parameters, at least five GUD blocks must be activated with MD `$MN_MM_NUM_GUD_MODULES`.

**Description of field limits:**
The maximum number of SynactGUD Boolean parameters is defined in machine data.

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**Attributes:**
- Global
- Block search
- Link
- Program sensitive
- No restrictions

### AXIS SYG_A5[n]

**Description:**
SYG_A5[n] Synact Axis parameters in GUD5 block.
A protection level can be assigned to the parameters with REDEF.
In order to create the parameters, at least five GUD blocks must be activated with MD `$MN_MM_NUM_GUD_MODULES`.

**Description of field limits:**
The maximum number of SynactGUD Axis is defined in machine data.

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**Attributes:**
- Global
- Block search
- Link
- Program sensitive
- No restrictions
### CHAR [SYG_C5[n]]

**description:**
SYG_C5[n] Synact Char parameters in GUD5 block. A protection level can be assigned to the parameters with REDEF.
In order to create the parameters, at least five GUD blocks must be activated with MD $MN_MM_NUM_GUD_MODULES.

**description of field limits:**
The maximum number of SynactGUD Char is defined in machine data

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**attributes:**
- Program sensitive
- No restrictions

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### STRING [SYG_S5[n]]

**description:**
SYG_S5[n] Synact parameter string in GUD5 block. The maximum string length has been limited to 31 characters. A protection level can be assigned to the parameters with REDEF.
In order to create the parameters, at least five GUD blocks must be activated with MD $MN_MM_NUM_GUD_MODULES.

**description of field limits:**
The maximum number of SynactGUD String is defined in machine data

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**attributes:**
- Program sensitive
- No restrictions
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Program sensitive No restrictions
### BOOL SYG_B6[n]

**Description:**
SYG_B6[n] Synact Boolean parameters in GUD6 block. A protection level can be assigned to the parameters with REDEF. In order to create the parameters, at least six GUD blocks must be activated with MD $MN_MM_NUM_GUD_MODULES.

**Description of Field Limits:**
The maximum number of SynactGUD Boolean parameters is defined in machine data.

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| read: | X | X | X | X | X | |
| write: | X | X | X | X | X | 7 |

**Attributes:**
- Global
- Block search
- Link
- Program sensitive
- No restrictions

### AXIS SYG_A6[n]

**Description:**
SYG_A6[n] Synact Axis parameters in GUD6 block. A protection level can be assigned to the parameters with REDEF. In order to create the parameters, at least six GUD blocks must be activated with MD $MN_MM_NUM_GUD_MODULES.

**Description of Field Limits:**
The maximum number of SynactGUD Axis is defined in machine data.

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<th>PP</th>
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<th>OPT</th>
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| read: | X | X | X | X | X | |
| write: | X | X | X | X | X | 7 |

**Attributes:**
- Global
- Block search
- Link
- Program sensitive
- No restrictions
### 1.27 User-specific system variables

**CHAR**  | **SYG_C6[n]**  
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**description:**  
SYG_C6[n] Synact Char parameters in GUD6 block. A protection level can be assigned to the parameters with REDEF. In order to create the parameters, at least six GUD blocks must be activated with MD $MN_MM_NUM_GUD_MODULES.

**description of field limits:**
The maximum number of SynactGUD Char is defined in machine data

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**STRING**  | **SYG_S6[n]**  
--- | ---
**description:**  
SYG_S6[n] Synact parameter string in GUD6 block. The maximum string length has been limited to 31 characters. A protection level can be assigned to the parameters with REDEF. In order to create the parameters, at least six GUD blocks must be activated with MD $MN_MM_NUM_GUD_MODULES.

**description of field limits:**
The maximum number of SynactGUD String is defined in machine data

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### 1.27 User-specific system variables

#### DOUBLE SYG_R7[n]

**Description:**
SYG_R7[n] Synact Real parameters in GUD6 block.
A protection level can be assigned to the parameters with REDEF.
In order to create the parameters, at least seven GUD blocks must be activated with MD $MN_MM_NUM_GUD_MODULES.

**Description of field limits:**
The maximum number of SynactGUD Real is defined in machine data

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#### INT SYG_I7[n]

**Description:**
SYG_I7[n] Synact Integer parameters in GUD6 block.
A protection level can be assigned to the parameters with REDEF.
In order to create the parameters, at least seven GUD blocks must be activated with MD $MN_MM_NUM_GUD_MODULES.

**Description of field limits:**
The maximum number of SynactGUD Integers is defined in machine data

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### 1.27 User-specific system variables

#### BOOL SYG_B7[n]

**Description:**
SYG_B7[n] Synact Boolean parameters in GUD7 block.

A protection level can be assigned to the parameters with REDEF.

In order to create the parameters, at least seven GUD blocks must be activated with MD `$MN-MM_NUM_GUD_MODULES`.

**Description of field limits:**
The maximum number of SynactGUD Boolean parameters is defined in machine data.

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<th>57.00.00</th>
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<tr>
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<td>Main run</td>
<td>Runin slp</td>
</tr>
<tr>
<td>Read:</td>
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<td>X</td>
</tr>
<tr>
<td>Write:</td>
<td>X</td>
<td>X</td>
</tr>
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<td>Attributes:</td>
<td>Global</td>
<td>Block search</td>
</tr>
<tr>
<td>Program sensitive:</td>
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<td>No restrictions</td>
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</table>

#### AXIS SYG_A7[n]

**Description:**
SYG_A7[n] Synact Axis parameters in GUD6 block.

A protection level can be assigned to the parameters with REDEF.

In order to create the parameters, at least seven GUD blocks must be activated with MD `$MN-MM_NUM_GUD_MODULES`.

**Description of field limits:**
The maximum number of SynactGUD Axis is defined in machine data.

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<td>Main run</td>
<td>Runin slp</td>
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<tr>
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<td>X</td>
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### 1.27 User-specific system variables

<table>
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<tr>
<th>CHAR</th>
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</tr>
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<td></td>
<td>read: X X X X X</td>
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<tr>
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### Description of SYG_R8[n]

**SYG_R8[n]** Synact Real parameters in GUD8 block.  
A protection level can be assigned to the parameters with **REDEF**.  
In order to create the parameters, at least eight GUD blocks must be activated with MD **$MN_MM_NUM_GUD_MODULES**.

**Description of Field Limits:**  
The maximum number of SynactGUD Real is defined in machine data.

**Axis Identifier:**  
NCK version: 57.00.00

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<th>Main Run</th>
<th>Runin Slp</th>
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**Read:**
- X (read)

**Write:**
- X (write)

**Attributes:**
- **Program sensitive**: No restrictions
- **No restrictions**

### Description of SYG_I8[n]

**SYG_I8[n]** Synact Integer parameters in GUD8 block.  
A protection level can be assigned to the parameters with **REDEF**.  
In order to create the parameters, at least eight GUD blocks must be activated with MD **$MN_MM_NUM_GUD_MODULES**.

**Description of Field Limits:**  
The maximum number of SynactGUD Integers is defined in machine data.

**Axis Identifier:**  
NCK version: 57.00.00

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**Read:**
- X (read)

**Write:**
- X (write)

**Attributes:**
- **Program sensitive**: No restrictions
- **No restrictions**
### System variable

**1 System variable**

**01/2008**

**1.27 User-specific system variables**

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**description of field limits:**
The maximum number of SynactGUD Integers is defined in machine data

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| Program sensitive | No restrictions |

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<td>In order to create the parameters, at least eight GUD blocks must be activated with MD $MN_MM_NUM_GUD_MODULES.</td>
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**description of field limits:**
The maximum number of SynactGUD Axis is defined in machine data

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<th>runin slip</th>
<th>Mrun syn</th>
<th>PP</th>
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<th>write</th>
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| Program sensitive | No restrictions |
### CHAR  SYG_C8[n]

**Description:**
SYG_C8[n] Synact Char parameters in GUD8 block. A protection level can be assigned to the parameters with REDEF. In order to create the parameters, at least eight GUD blocks must be activated with MD $MN_MM_NUM_GUD_MODULES.

**Description of Field Limits:**
The maximum number of SynactGUD Char is defined in machine data.

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<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>Access Rights</th>
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<td>X</td>
<td>X</td>
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</tr>
<tr>
<td>Write</td>
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**Attributes:**
- Global
- Block Search
- Link

Program Sensitive: No restrictions

### STRING  SYG_S8[n]

**Description:**
SYG_S8[n] Synact parameter string in GUD8 block. The maximum string length has been limited to 31 characters. A protection level can be assigned to the parameters with REDEF. In order to create the parameters, at least eight GUD blocks must be activated with MD $MN_MM_NUM_GUD_MODULES.

**Description of Field Limits:**
The maximum number of SynactGUD String is defined in machine data.

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<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Write</td>
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<td>X</td>
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**Attributes:**
- Global
- Block Search
- Link

Program Sensitive: No restrictions
### User-specific system variables

#### DOUBLE SYG_R9[n]

**Description:**
SYG_R9[n] Synact Real parameters in GUD9 block.
A protection level can be assigned to the parameters with REDEF.
In order to create the parameters, at least nine GUD blocks must be activated with MD $MN_MM_NUM_GUD_MODULES.

**Description of field limits:**
The maximum number of SynactGUD Real is defined in machine data

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**Attributes:**
Program sensitive
No restrictions

#### INT SYG_I9[n]

**Description:**
SYG_I9[n] Synact Integer parameters in GUD9 block.
A protection level can be assigned to the parameters with REDEF.
In order to create the parameters, at least nine GUD blocks must be activated with MD $MN_MM_NUM_GUD_MODULES.

**Description of field limits:**
The maximum number of SynactGUD Integers is defined in machine data

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**Attributes:**
Program sensitive
No restrictions
### BOOL SYG_B9[n]

**description:**
SYG_B9[n] Synact Boolean parameters in GUD9 block.

A protection level can be assigned to the parameters with REDEF.

In order to create the parameters, at least nine GUD blocks must be activated with MD $MN_MM_NUM_GUD_MODULES.

**description of field limits:**
The maximum number of SynactGUD Boolean parameters is defined in machine data.

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**attributes:**
- global
- block
- search
- link

Program sensitive
No restrictions

### AXIS SYG_A9[n]

**description:**
SYG_A9[n] Synact Axis parameters in GUD9 block.

A protection level can be assigned to the parameters with REDEF.

In order to create the parameters, at least nine GUD blocks must be activated with MD $MN_MM_NUM_GUD_MODULES.

**description of field limits:**
The maximum number of SynactGUD Axis is defined in machine data.

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<tr>
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**attributes:**
- global
- block
- search
- link

Program sensitive
No restrictions
### User-specific system variables

**CHAR**

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**description of field limits:**

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### DOUBLE SYG_RS[n]

**Description:**
SYG_RS[n] Synchronization Real parameters in SGUD block.
A protection level can be assigned to the parameters with REDEF.
In order to create the parameters, at least one GUD block must be activated with MD $MN_MM_NUM_GUD_MODULES.

**Description of Field Limits:**
The maximum number of SynactGUD Real is defined in machine data

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**Attributes:**
Program sensitive No restrictions

### INT SYG_IS[n]

**Description:**
SYG_IS[n] Synact Integer parameters in SGUD block.
A protection level can be assigned to the parameters with REDEF.
In order to create the parameters, at least one GUD block must be activated with MD $MN_MM_NUM_GUD_MODULES.

**Description of Field Limits:**
The maximum number of SynactGUD Integers is defined in machine data

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</tr>
<tr>
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</tr>
<tr>
<td>read</td>
<td>X</td>
</tr>
<tr>
<td>write</td>
<td>X</td>
</tr>
</tbody>
</table>

**Attributes:**
Program sensitive No restrictions
### BOOL SYG_BS[n]

**Description:**
SYG_BS[n] Synact Boolean parameters in SGUD block.
A protection level can be assigned to the parameters with REDEF.
In order to create the parameters, at least one GUD block must be activated with MD $MN_MN_NUM_GUD_MODULES.

**Description of field limits:**
The maximum number of SynactGUD Boolean parameters is defined in machine data

<table>
<thead>
<tr>
<th>Unit</th>
<th>Run-in</th>
<th>Main Run</th>
<th>Runin Slip</th>
<th>Mrun Syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>Access Rights</th>
</tr>
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<td>-</td>
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<td>X</td>
<td>X</td>
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</tbody>
</table>

**Properties:**
Program sensitive No restrictions

### AXIS SYG_AS[n]

**Description:**
SYG_AS[n] Synchronization axis parameters in SGUD block.
A protection level can be assigned to the parameters with REDEF.
In order to create the parameters, at least one GUD block must be activated with MD $MN_MN_NUM_GUD_MODULES.

**Description of field limits:**
The maximum number of SynactGUD Axis is defined in machine data

<table>
<thead>
<tr>
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<th>Main Run</th>
<th>Runin Slip</th>
<th>Mrun Syn</th>
<th>PP</th>
<th>SA</th>
<th>OPT</th>
<th>OEM</th>
<th>Access Rights</th>
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<td>X</td>
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**Properties:**
Program sensitive No restrictions
### 1.27 User-specific system variables

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<th>description</th>
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<td></td>
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<td>SYG_CS[n] Synchronization Char parameters in SGUD block. A protection level can be assigned to the parameters with REDEF. In order to create the parameters, at least one GUD block must be activated with MD $MN_MM_NUM_GUD_MODULES.</td>
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<tr>
<td>min.:</td>
<td>max.:</td>
</tr>
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</tr>
<tr>
<td>read:</td>
<td>X X X X X X X X X X X</td>
</tr>
<tr>
<td>write:</td>
<td>X X X X X X X X X X X</td>
</tr>
<tr>
<td>attr.:</td>
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<table>
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<tr>
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<td>SYG_SS[n] Synchronized action parameter string in SGUD block. The maximum string length has been limited to 31 characters. A protection level can be assigned to the parameters with REDEF. In order to create the parameters, at least one GUD block must be activated with MD $MN_MM_NUM_GUD_MODULES.</td>
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<tr>
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<td>main run  runin sfp  Mrun syn PP SA OPI OEM access rights</td>
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<tr>
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<tr>
<td>write:</td>
<td>X X X X X X X X X X X</td>
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<tr>
<td>attr.:</td>
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### 1.28 Kinematic chain

<table>
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<th>description: $\text{SNK_CHAIN_NAME}[n]$ Name of the nth kinematic chain. The maximum possible number of kinematic chains is set by MD $\text{MN_MM_MAXNUM_KIN_CHAINS}$. description of field limits: The maximum number of kinematic chains is set in MD $\text{MN_MM_MAXNUM_KIN_CHAINS}$.</th>
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<tbody>
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<td>unit:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin stp</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td>X</td>
</tr>
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<td>attributes:</td>
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<td>block search</td>
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<td></td>
</tr>
<tr>
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<td>main run</td>
<td>runin stp</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
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<table>
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</thead>
<tbody>
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<tr>
<td>unit:</td>
<td></td>
<td></td>
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<tr>
<td>run-in</td>
<td>main run</td>
<td>runin stp</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
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<td>attributes:</td>
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<td>block search</td>
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<tr>
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<td>No restrictions</td>
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### STRING $\text{SNK\_NEXT}[n]$

**description:**

$\text{SNK\_NEXT}[n]$

Name of next chain element. An empty string "" means the end of the chain.

**description of field limits:**

The maximum number of elements of kinematic

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>unit</th>
<th>min.:</th>
<th>max.:</th>
<th>run-in</th>
<th>main run</th>
<th>runin slip</th>
<th>Mrun synth</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin slip</td>
<td>Mrun synth</td>
<td>PP</td>
<td>SA</td>
<td>OPI</td>
<td>OEM</td>
<td>access rights</td>
<td></td>
<td></td>
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<tr>
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<td>write:</td>
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<td>X</td>
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### STRING $\text{SNK\_NEXTP}[n]$

**description:**

$\text{SNK\_NAMEP}[n]$

Name of a further next chain element. This is needed for chain branches which occur in the case of parallel kinematic sequences. An empty string "" means that no further chain element exists.

**description of field limits:**

The maximum number of elements of kinematic

<table>
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<tr>
<th>axis identifier</th>
<th>unit</th>
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<th>max.:</th>
<th>run-in</th>
<th>main run</th>
<th>runin slip</th>
<th>Mrun synth</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>access rights</th>
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</thead>
<tbody>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin slip</td>
<td>Mrun synth</td>
<td>PP</td>
<td>SA</td>
<td>OPI</td>
<td>OEM</td>
<td>access rights</td>
<td></td>
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</tr>
<tr>
<td>read:</td>
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<tr>
<td>attributes:</td>
<td>global</td>
<td>block search</td>
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<td>No restrictions</td>
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<td></td>
<td></td>
<td></td>
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</table>

### DOUBLE $\text{SNK\_OFF\_DIR}[n,3]$

**description:**

$\text{SNK\_OFF}[n, i]$

Describes the 3 components of the offset vector of a constant chain link or the direction of the axis of a variable chain link.

If the vector describes a direction, the value of the vector must not equal 0. Otherwise not relevant.

**description of field limits:**

The maximum number of elements of kinematic

Index of the 3 components (0 <= i <= 2).

<table>
<thead>
<tr>
<th>axis identifier</th>
<th>unit</th>
<th>min.:</th>
<th>max.:</th>
<th>run-in</th>
<th>main run</th>
<th>runin slip</th>
<th>Mrun synth</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin slip</td>
<td>Mrun synth</td>
<td>PP</td>
<td>SA</td>
<td>OPI</td>
<td>OEM</td>
<td>access rights</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
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<td>X</td>
<td>X</td>
<td>X</td>
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</tr>
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<td>ink</td>
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<td>No restrictions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Kinematic chain

#### Name of machine axis or frame

- **$NK_AXIS[n]$**
  - Description: Name of machine axis or frame.
  - Description: If the content of this element is not identical with the name of the machine axis (no difference made between small and capital letters), then the string designates a frame describing the change of this chain link compared to the previous link. In this case, the software using this kinematic chain must provide the frame data for this element.
  - If $NK_AXIS[n]$ contains the zero string, the entire data block describes a constant chain link.

#### Position of the axis in the zero point

- **$NK_A_OFF[n]$**
  - Description: Relevant only if the chain link describes an axis. In this case, this element indicates the position of the axis in the zero point.
  - In the case of linear axes, this value is redundant as it can also be replaced by a changed offset of the previous link.

---

<table>
<thead>
<tr>
<th>STRING</th>
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</thead>
<tbody>
<tr>
<td>Name of machine axis or frame.</td>
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<td>Is relevant only if the chain link describes an axis. In this case, this element indicates the position of the axis in the zero point. In the case of linear axes, this value is redundant as it can also be replaced by a changed offset of the previous link.</td>
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<tr>
<td>main run</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
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<td>Mrun syn</td>
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<th>read:</th>
<th>write:</th>
<th>attributes:</th>
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<tr>
<td>Mrun syn</td>
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<td>OPT</td>
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</tr>
<tr>
<td>OEM</td>
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</table>

**Not classified** No restrictions
### $\text{SNK\_ROT}[\text{n}, 3]$

**Description:**
Components of the rotary axis for a coordinate rotation in element n of a kinematic chain.

**Description of Field Limits:**
The maximum number of elements of kinematic axis.
The 2nd index designates the vector component (0 <= i <= 2).

<table>
<thead>
<tr>
<th>Axis Identifier:</th>
<th>NCK version:</th>
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<tbody>
<tr>
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<th>DBL_MIN</th>
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<th>DBL_MAX</th>
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<td>runin slip</td>
<td>MfRain syn</td>
<td>PP</td>
<td>SA</td>
</tr>
<tr>
<td>read:</td>
<td>$X$</td>
<td></td>
<td></td>
<td>$X$</td>
<td>$X$</td>
</tr>
<tr>
<td>write:</td>
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<td>$X$</td>
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<tr>
<td>Attributes:</td>
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<td>link</td>
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<td></td>
</tr>
<tr>
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<td>Not classified</td>
<td>No restrictions</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

### $\text{SNK\_ANG}[\text{n}]$

**Description:**
Angle (in degrees) of a coordinate rotation in element n of a kinematic chain.

**Description of Field Limits:**
The maximum number of elements of kinematic axis.

<table>
<thead>
<tr>
<th>Axis Identifier:</th>
<th>NCK version:</th>
</tr>
</thead>
<tbody>
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<td>$\text{SNK_ANG}[\text{n}]$</td>
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</tbody>
</table>

<table>
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<th>DBL_MAX</th>
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<td>runin slip</td>
<td>MfRain syn</td>
<td>PP</td>
<td>SA</td>
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<tr>
<td>read:</td>
<td>$X$</td>
<td></td>
<td></td>
<td>$X$</td>
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<tr>
<td>write:</td>
<td>$X$</td>
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<td>$X$</td>
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<td>Attributes:</td>
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<td>block search</td>
<td>link</td>
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<td></td>
</tr>
<tr>
<td>Access Rights:</td>
<td>Not classified</td>
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</table>
1.29 Protection area elements

<table>
<thead>
<tr>
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<th>description:</th>
</tr>
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<tbody>
<tr>
<td>$NP_PROT_NAME[n]</td>
<td>$NP_PROT_NAME[n] Name of protection area n.</td>
</tr>
</tbody>
</table>

**description of field limits:**
The maximum number of protection areas is defined by MD axis identifier:

<table>
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<th>axis</th>
<th>identifier:</th>
<th>NCK version:</th>
<th>58.00.00</th>
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</thead>
<tbody>
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<td>run-in</td>
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<td>runin stp</td>
<td>Mrun syn</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
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<td>block search</td>
<td>link</td>
<td></td>
</tr>
<tr>
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<td>No restrictions</td>
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<table>
<thead>
<tr>
<th>STRING</th>
<th>description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$NP_CHAIN_NAME[n]</td>
<td>$NP_CHAIN_NAME[n] The point in a kinematic chain to which the current protection area has been assigned, is defined by the two variables $NP_CHAIN_NAME and $NP_CHAIN_ELEM. If only $NP_CHAIN_NAME is indicated, the protection area is assigned to the beginning of the indicated chain.</td>
</tr>
</tbody>
</table>

**description of field limits:**
The maximum number of protection areas is defined by MD axis identifier:

<table>
<thead>
<tr>
<th>axis</th>
<th>identifier:</th>
<th>NCK version:</th>
<th>58.00.00</th>
</tr>
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<tbody>
<tr>
<td>run-in</td>
<td>main run</td>
<td>runin stp</td>
<td>Mrun syn</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
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<td></td>
</tr>
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</table>
### 1.29 Protection area elements

**STRING $NP_CHAIN_ELEM[n]$**

| description: | $NP_CHAIN_ELEM[n]$  
See description of $NP_CHAIN_NAME[n]$ |

**description of field limits:**
The maximum number of protection areas is defined by MD

<table>
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<tr>
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<tr>
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<td>main run</td>
</tr>
<tr>
<td>read: X</td>
<td>X</td>
</tr>
<tr>
<td>write: X</td>
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<td>attributes: global</td>
<td>block search</td>
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<tr>
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**STRING $NP_1ST_PROT[n]$**

| description: | $NP_1ST_PROT$  
Name of first element of a protection area |

**description of field limits:**
The maximum number of protection areas is defined by MD

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<tr>
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<td>-</td>
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<tr>
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</tr>
<tr>
<td>read: X</td>
<td>X</td>
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<tr>
<td>write: X</td>
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</tr>
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<td>No restrictions</td>
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</table>
### INT $\text{NP\_BIT\_NO}[n]$

**Description:**

$\text{NP\_BIT\_NO}$

64 bits are defined in the PLC interface through which protection areas can be activated once they have been preactivated with the command PROTA(1(,......)). The entry indicates which bit has been assigned to this protection area. The default value is -1, i.e. no interface bit has been assigned to this protection area.

**Description of Field Limits:**

The maximum number of protection areas is defined by MD

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<tr>
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<td>runin stp</td>
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<td>Mrun syn</td>
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<td></td>
</tr>
<tr>
<td>SA</td>
<td></td>
<td></td>
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<td>OPI</td>
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<td>X</td>
</tr>
<tr>
<td>write:</td>
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<td>X</td>
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<tr>
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<td>block</td>
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<tr>
<td></td>
<td>Not classified</td>
<td>No restrictions</td>
</tr>
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</table>

### CHAR $\text{NP\_INIT\_STAT}[n]$

**Description:**

$\text{NP\_INIT\_STAT}$

Activation status of the protection area at first selection without indication of an activation status. This status is activated for defined protection areas also during runup of the control.

The permitted values are:

- Activated ('A' or 'a'),
- Inactivated ('I' or 'i'),
- Preactivated ('P' or 'p').

Default value is 'I'.

**Description of Field Limits:**

The maximum number of protection areas is defined by MD

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<td>-</td>
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<tr>
<td>main run</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>runin stp</td>
<td></td>
<td></td>
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<tr>
<td>Mrun syn</td>
<td></td>
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<tr>
<td>PP</td>
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<tr>
<td>read:</td>
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</table>
### 1.29 Protection area elements

**INT**

<table>
<thead>
<tr>
<th>Description</th>
<th>$\text{NP_INDEX}[n, \text{MAXNUM_3D_PROT_TOOL_INDICES}]$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description:</td>
<td>$\text{NK_INDEX}[n, i]$</td>
</tr>
<tr>
<td>This component is evaluated only if $\text{NP_PROT_NAME}[n]$ contains a reserved name. If $\text{NP_PROT_NAME}[n]$ contains a name in the form _TOOLXX or _MAGXX, $\text{NP_INDEX}[n, 0]$ refers to the number of the channel in which the tool or magazine is defined. If $\text{NP_PROT_NAME}[n]$ contains a name in the form _TOOLXX, $\text{NP_INDEX}[n, 1]$ gives the number of the spindle which contains the tool.</td>
<td></td>
</tr>
</tbody>
</table>

**Description of Field Limits:**
The maximum number of protection areas is defined by MD |

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</tr>
<tr>
<td>Read: X</td>
<td>X</td>
</tr>
<tr>
<td>Write: X</td>
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<tr>
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**STRING**

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<th>Description:</th>
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<tr>
<td>Description:</td>
<td>$\text{NP_NAME}$</td>
</tr>
<tr>
<td>Name of protection zone element.</td>
<td></td>
</tr>
</tbody>
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**Description of Field Limits:**
The maximum number of elements in protection areas is defined by MD |

<table>
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<td>Run-in</td>
<td>Main run</td>
</tr>
<tr>
<td>Read: X</td>
<td>X</td>
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<tr>
<td>Write: X</td>
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<tr>
<td>Attributes: Global</td>
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</table>
### STRING \$NP_NEXT[n]

**description:**

\$NP_NEXT[n]

Name of next protection zone element.

**description of field limits:**

The maximum number of elements in protection areas is defined by MD axis identifier:

<table>
<thead>
<tr>
<th>run-in</th>
<th>main run</th>
<th>runin slip</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
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<td>-</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
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</table>

**unit:** -

**min.:** -

**max.:** -

**run-in main run runin slip Mrun syn PP SA OPI OEM access rights**

**read:** X

**write:** X

**attributes:** global block search link

Not classified No restrictions

### STRING \$NP_ADD[n]

**description:**

\$NP_ADD[n]

Name of protection element to be added to the current protection zone.

**description of field limits:**

The maximum number of elements in protection areas is defined by MD axis identifier:

<table>
<thead>
<tr>
<th>run-in</th>
<th>main run</th>
<th>runin slip</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>access rights</th>
</tr>
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<td></td>
</tr>
</tbody>
</table>

**unit:** -

**min.:** -

**max.:** -

**run-in main run runin slip Mrun syn PP SA OPI OEM access rights**

**read:** X

**write:** X

**attributes:** global block search link

Not classified No restrictions
### STRING  $NP\_TYPE[n]$

**description:**

$NP\_TYPE[n]$

Type of elementary body. The following elementary bodies are possible:
1. **BOX (L, W, H):** Axis-parallel cuboid, symmetrical to zero point with dimensions L in the X direction, W in the Y direction and H in the Z direction, i.e. the corners of the cuboid lie at n (+/-L/2, +/-W/2, +/-H/2).
2. **SPHERE (R):** Sphere in zero point with radius R.
3. **CYLINDER (H, R):** Cylinder with radius R and height H, longitudinal axis parallel to Z axis. The center point of the cylinder lies in the zero point, i.e. the two limiting circular areas are parallel to the X-Y plane and lie at +/-H/2.

**description of field limits:**

The maximum number of elements in protection areas is defined by MD

<table>
<thead>
<tr>
<th>axis identifier:</th>
<th>NCK version:</th>
</tr>
</thead>
<tbody>
<tr>
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</tbody>
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<table>
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<th>min.:</th>
<th>max.:</th>
</tr>
</thead>
<tbody>
<tr>
<td>run-in</td>
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<td>X</td>
</tr>
<tr>
<td>main run</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>runin stp</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mrun syn</td>
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</tr>
<tr>
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<td></td>
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<tr>
<td>SA</td>
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</tr>
<tr>
<td>UPI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OEM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>access rights</td>
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<table>
<thead>
<tr>
<th>read:</th>
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<tr>
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<td>search</td>
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<tr>
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</tr>
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</table>

**DOUBLE  $NP\_PARA[n,MAXNUM\_3D\_PROT\_PARA\_COUNT]$**

**description:**

$NP\_PARA[n, i]$

Parameters for describing the type of an elementary body. A maximum of 5 parameters are required for the types of elementary body described under $NP\_TYP$.

**description of field limits:**

The maximum number of elements in protection areas is defined by MD

The maximum number of parameters is 3.

<table>
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</table>

**Not classified No restrictions**
### 1.29 Protection area elements

**DOUBLE** $\text{SNP\_OFF}[n,3]$

**description:**

$\text{SNP\_OFF}[n, i]$

Component $i$ $(0 \leq i \leq 2)$ of the offset vector of protection zone element $n$.

**description of field limits:**

The maximum number of elements in protection areas is defined by MD.

The 2nd index $i$ designates the coordinate axis $(0 \leq i \leq 2)$.

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<tr>
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**DOUBLE** $\text{SNP\_DIR}[n,3]$

**description:**

$\text{SNP\_ROT}[n, i]$

Components of the rotary axis for a coordinate rotation in element $n$ of a kinematic chain.

**description of field limits:**

The maximum number of elements in protection areas is defined by MD.

The 2nd index designates the vector component $(0 \leq i \leq 2)$.

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</table>

**DOUBLE** $\text{SNP\_ANG}[n]$

**description:**

$\text{SNP\_ANG}[n]$

Angle (in degrees) of a coordinate rotation in protection area element $n$.

**description of field limits:**

The maximum number of elements in protection areas is defined by MD.

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### STRING \$NP_GROUP_NAME[n]

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<th>description:</th>
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**description of field limits:**
The maximum number of protection area groups is defined by MD

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Not classified No restrictions

### STRING \$NP_ADD_GROUP[n]

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**description of field limits:**
The maximum number of protection area groups is defined by MD

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<th>NCK version: 58.00.00</th>
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</thead>
<tbody>
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<td>run-in</td>
<td>main run</td>
</tr>
<tr>
<td>runin</td>
<td>Mrun syn</td>
</tr>
<tr>
<td>unit:</td>
<td></td>
</tr>
<tr>
<td>min.:</td>
<td>max.:</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
<td>X</td>
</tr>
<tr>
<td>attributes:</td>
<td>global</td>
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<td></td>
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<tr>
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Not classified No restrictions

### STRING \$NP_MEMBER_1[n]

<table>
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<th>description:</th>
<th>1st protection area of protection area group</th>
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**description of field limits:**
The maximum number of protection area groups is defined by MD

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<tbody>
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<tr>
<td>unit:</td>
<td></td>
</tr>
<tr>
<td>min.:</td>
<td>max.:</td>
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<tr>
<td>read:</td>
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<td>X</td>
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Not classified No restrictions
**1 System variable** 01/2008

1.29 Protection area elements

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<tr>
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<td>run-in</td>
<td>main run</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>write:</td>
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<td>NCK version: 58.00.00</td>
<td></td>
</tr>
<tr>
<td>unit:</td>
<td>run-in</td>
<td>main run</td>
</tr>
<tr>
<td>read:</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
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<td>NCK version: 58.00.00</td>
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<tr>
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<td>run-in</td>
<td>main run</td>
</tr>
<tr>
<td>read:</td>
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<td>X</td>
</tr>
<tr>
<td>write:</td>
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## 1.30 Coordinate system-specific working area limitation

<table>
<thead>
<tr>
<th>System Variable</th>
<th>Description</th>
<th>Current Values</th>
<th>AccessType</th>
<th>Attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>$P_WORKAREA_CS_COORD_SYS_TEM[n]$</td>
<td>Coordinate system in which the group is to apply.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$P_WORKAREA_CS_PLUS_ENABL[n,m]$</td>
<td>TRUE: The coordinate system-specific working area limitation in the plus direction is valid for the stated axis of the stated group.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### INT $P\_WORKAREA\_CS\_COORD\_SYS\_TEM[n]$

- **Description:**
  - Coordinate system in which the group is to apply.
  - The following values apply:
    - Working area limitation in the WCS
    - Working area limitation in the SZS

- **Axis Identifier:**
  - GEOAX
  - CHANAX
  - MACHAX

- **Unit:** INT

- **Current Values:**
  - Min.: INT_MIN
  - Max.: INT_MAX

- **Run-In:**
  - Main Run
  - Run-in Stop
  - Mrun Syn

- **PP:**
  - SA
  - OPT
  - OEM

- **Access Rights:**
  - Read: X
  - Write: X

- **Attributes:**
  - Global
  - Block Search
  - Link

### BOOL $P\_WORKAREA\_CS\_PLUS\_ENABL[n,m]$

- **Description:**
  - TRUE: The coordinate system-specific working area limitation in the plus direction is valid for the stated axis of the stated group. (See $P\_WORKAREA\_CS\_LIMIT\_PLUS[groupNo, ax]$)

- **Axis Identifier:**
  - GEOAX
  - CHANAX
  - MACHAX

- **Unit:**
  - Min.: FALSE
  - Max.: TRUE

- **Run-In:**
  - Main Run
  - Run-in Stop
  - Mrun Syn

- **PP:**
  - SA
  - OPT
  - OEM

- **Access Rights:**
  - Read: X
  - Write: X

- **Attributes:**
  - Global
  - Block Search
  - Link

---

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SINUMERIK 840D sl/840Di sl/ 840D/ 840Di, List of System Variables (PGA1), 01/2008
### 1 System variable

#### 1.30 Coordinate system-specific working area limitation

**BOOL**

$\text{SP\_WORKAREA\_CS\_MINUS\_ENAB}\[n,m]\$

<table>
<thead>
<tr>
<th>Description:</th>
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<tbody>
<tr>
<td>TRUE: The coordinate system-specific working area limitation in the minus direction is valid for the stated axis of the stated group. (See $\text{SP_WORKAREA_CS_LIMIT_MINUS}[\text{groupNo}, ax]$)</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Axis identifier:</th>
</tr>
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<tbody>
<tr>
<td>GEOAX</td>
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<tr>
<td>CHANAX</td>
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<tr>
<td>MACHAX</td>
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<table>
<thead>
<tr>
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<table>
<thead>
<tr>
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<tbody>
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<thead>
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<tbody>
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<td>main run</td>
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<table>
<thead>
<tr>
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</thead>
<tbody>
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<table>
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**DOUBLE**

$\text{SP\_WORKAREA\_CS\_LIMIT\_PLUS}\[n,m]\$

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<th>Unit:</th>
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<td>main run</td>
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<table>
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<tr>
<th>Runin slp:</th>
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<tr>
<td>Mrun slp</td>
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<table>
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<table>
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<th>OPT:</th>
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<tr>
<td>OEM</td>
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<table>
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### 1.31 ePS Network Services

#### $P\_WORKAREA\_CS\_LIMIT\_MINUS[n,m]$

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<th>Description:</th>
<th>The coordinate system-specific working area limitation in the minus direction for the stated axis of the stated group. This value is evaluated only if $P_WORKAREA_CS_MINUS_ENABLE = TRUE$.</th>
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<tr>
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<td>main run \t runin slip \t Mrun syn \t PP \t SA \t OPI \t OEM access rights</td>
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#### $EPS\_R[n]$

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<td>Run-in</td>
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<tr>
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<td>Attributes:</td>
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<tr>
<td>Unit:</td>
<td>run-in main run runin stp Mrun syn PP SA OPT OEM access rights</td>
</tr>
<tr>
<td>Read:</td>
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</tr>
<tr>
<td>Write:</td>
<td>X X X X 7</td>
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<tr>
<td>Attributes:</td>
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### BOOL $EPS_B[n]$

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<tr>
<td>Unit:</td>
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</tr>
<tr>
<td>Read:</td>
<td>X X X X X</td>
</tr>
<tr>
<td>Write:</td>
<td>X X X X 7</td>
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<td>Attributes:</td>
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### AXIS $EPS_A[n]$

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<tr>
<td>Unit:</td>
<td>run-in main run runin stp Mrun syn PP SA OPT OEM access rights</td>
</tr>
<tr>
<td>Read:</td>
<td>X X X X X</td>
</tr>
<tr>
<td>Write:</td>
<td>X X X X 7</td>
</tr>
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<td>Attributes:</td>
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### CHAR

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**description of field limits:**

The maximum number of ePS parameters of Type CHAR is given by the machine data $MN_MM_EPSPARAM_DIMENSION

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</table>

<table>
<thead>
<tr>
<th>unit: run-in</th>
<th>main run</th>
<th>runin stp</th>
<th>Mrun syn</th>
<th>PP</th>
<th>SA</th>
<th>OPI</th>
<th>OEM</th>
<th>access rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>read:</td>
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<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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</table>

| write:        | X        | X         | X        | X  | X  | X   | 7   |               |

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</tbody>
</table>

Program sensitive | No restrictions

### STRING

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**description of field limits:**

The maximum number of ePS parameters of Type STRING is given by the machine data $MN_MM_EPSPARAM_DIMENSION

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<th>main run</th>
<th>runin stp</th>
<th>Mrun syn</th>
<th>PP</th>
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<th>OPI</th>
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<th>access rights</th>
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| write:        | X        | X         | X        | X  | X  | X   | 7   |               |

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Program sensitive | No restrictions

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1-659
### 1.32 Tool data ISO dialect milling

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<td>unit:</td>
<td>mm</td>
<td>min.: DBL_MIN</td>
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<td>main run</td>
<td>runin stp</td>
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<td>runin stp</td>
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<td>write:</td>
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<td>Correction value memory for the wear of the tool radius in ISO2 mode. Is available only if ISO2 mode is active.</td>
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<td>axis identifier:</td>
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<td>mm</td>
<td>min.:</td>
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<td>main run</td>
<td>runin slip</td>
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### 1.33 Tool data ISO dialect turning

**$TC_ISO_L1[n]$**

**Description:**
Correction value memory for the geometry of tool length 1 in ISO3 mode. Is available only if ISO3 mode is active.

**Field limits:**
- **n:** correction number of ISO tool correction parameter
- **axis identifier:**
  - NCK version: 69.00.00
  - Unit: mm
  - Min.: DBL_MIN
  - Max.: DBL_MAX
- **run-in**
  - Read: X
  - Write: X
- **main run**
  - Read: X
  - Write: X
- **runin stp**
  - Read: X
  - Write: X
- **Mrun syn**
  - Read: X
  - Write: X
- **attributes:**
  - Global: Not classified
  - Block search: No restrictions

**$TC_ISO_L1W[n]$**

**Description:**
Correction value memory for the wear of tool length 1 in ISO3 mode. Is available only if ISO3 mode is active.

**Field limits:**
- **n:** correction number of ISO tool correction parameter
- **axis identifier:**
  - NCK version: 69.00.00
  - Unit: mm
  - Min.: DBL_MIN
  - Max.: DBL_MAX
- **run-in**
  - Read: X
  - Write: X
- **main run**
  - Read: X
  - Write: X
- **runin stp**
  - Read: X
  - Write: X
- **Mrun syn**
  - Read: X
  - Write: X
- **attributes:**
  - Global: Not classified
  - Block search: No restrictions
### 1.33 Tool data ISO dialect turning

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<td>Correction value memory for the geometry of tool length 2 in ISO3 mode.</td>
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<td>Is available only if ISO3 mode is active.</td>
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**Description of field limits:**

- **n:** correction number of ISO tool correction parameter
- **axis identifier:**
- **unit:**
- **NCK version:** 69.00.00
- **run-in**: main run runin slip Mrun syn PP SA OPT OEM access rights
- **read:** X
- **write:** X
- **attributes:** global block search link
- **Not classified**
- **No restrictions**

**DOUBLE $TC_ISO_L2W[n]$**

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**Description of field limits:**

- **n:** correction number of ISO tool correction parameter
- **axis identifier:**
- **unit:**
- **NCK version:** 69.00.00
- **run-in**: main run runin slip Mrun syn PP SA OPT OEM access rights
- **read:** X
- **write:** X
- **attributes:** global block search link
- **Not classified**
- **No restrictions**

**DOUBLE $TC_ISO_L3[n]$**

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<td>Correction value memory for the geometry of tool length 3 in ISO3 mode.</td>
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**Description of field limits:**

- **n:** correction number of ISO tool correction parameter
- **axis identifier:**
- **unit:**
- **NCK version:** 69.00.00
- **run-in**: main run runin slip Mrun syn PP SA OPT OEM access rights
- **read:** X
- **write:** X
- **attributes:** global block search link
- **Not classified**
- **No restrictions**
### $TC_ISO_L3W[n]$

**Description:**
Correction value memory for the wear of tool length 3 in ISO3 mode. Is available only if ISO3 mode is active.

**Field limits:**
- **n**: correction number of iso tool correction parameter
- **Unit**: mm
- **Min.**: DBL_MIN
- **Max.**: DBL_MAX

**Access rights:**
- Read: X
- Write: X

**Attributes:**
- Global
- Block search

### $TC_ISO_R[n]$

**Description:**
Correction value memory for the geometry of the tool radius in ISO3 mode. Is available only if ISO3 mode is active.

**Field limits:**
- **n**: correction number of iso tool correction parameter
- **Unit**: mm
- **Min.**: DBL_MIN
- **Max.**: DBL_MAX

**Access rights:**
- Read: X
- Write: X

**Attributes:**
- Global
- Block search

### $TC_ISO_RW[n]$

**Description:**
Correction value memory for the wear of the tool radius in ISO3 mode. Is available only if ISO3 mode is active.

**Field limits:**
- **n**: correction number of iso tool correction parameter
- **Unit**: mm
- **Min.**: DBL_MIN
- **Max.**: DBL_MAX

**Access rights:**
- Read: X
- Write: X

**Attributes:**
- Global
- Block search
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<td>read:</td>
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<tr>
<td>write:</td>
<td>X</td>
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| Not classified | No restrictions |

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1.33 Tool data ISO dialect turning
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SINUMERIK 840D sl/840Di sl/ 840D/ 840Di, List of System Variables (PGA1), 01/2008

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<tr>
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<tr>
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</tr>
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Suggestions and/or corrections

General Documentation

- SINUMERIK Brochure
- SINUMERIK Catalog NC 61 *
- Safety Integrated Application Manual

User Documentation

- SINUMERIK 840D 840Di 810D Operator's Guide
  - HMI Embedded *
  - ShopMill
  - ShopTurn
  - HT6
- SINUMERIK 840D 840Di 810D Operator's Guide
  - HMI Advanced *
  - Programming compact
- SINUMERIK 840D 840Di 810D Programming Guide
  - Fundamentals *
  - Advanced *
  - Programming
  - Lists System Variables
  - ISO Turning/Milling
- SINUMERIK 840D 840Di 810D Programming Guide
  - Cycles
  - Measuring Cycles
- SINUMERIK 840D 840Di 810D Diagnostics Guide *
- SINUMERIK 840Di System Overview

Manufacturer/Service Documentation

- SINUMERIK 840D 840Di 810D Configuring (HW) *
  - Equipment Manual
  - Operator Components *
- SINUMERIK 840D 840Di 810D Commissioning Manual *
  - 840D
  - 810D
  - HMI
- SINUMERIK 840D 840Di 810D Description of Functions
  - Basic Machine *
  - Extended Functions
  - Special Functions
  - Synchronized Actions
  - Iso Dialects
  - EMC Guidelines
- SINUMERIK 840D 840Di 810D Commissioning Manual
  - Part 1
  - Part 2

Electronic Documentation

- SINUMERIK SIMODRIVE Motors
  - DOCONCD *
  - DOCONWEB

*) These documents are a minimum requirement
Dokumentationsübersicht SINUMERIK 840D sl / 840Di sl

Allgemeine Dokumentation

- Werbeschrift
- Katalog NC 61 *)
- Katalog D21.1 Umrichter-Einbaugeräte *)

Anwender-Dokumentation

- Bedienhandbuch
  - HMI sl Universal / Drehen / Fräsen *)
  - HMI Embedded *)
  - ShopMill
  - ShopTurn
- Bedienhandbuch
  - HMI Advanced *)
  - Bedienung Kompakt
- Programmierhandbuch
  - Grundlagen *)
  - Arbeitsvorbereitung *)
  - Programmierung Kompakt
  - Listen Systemvariablen
  - ISO Turning/Milling
- Diagnosehandbuch *)

Hersteller-/Service-Dokumentation

- Gerätehandbuch
  - NCU *)
  - Maschinenprojektierung
- Gerätehandbuch
  - Bedienkomponenten und Vernetzung *)
- Inbetriebnahmehandbuch
  - CNC
  - NCK, PLC, Antrieb *)
  - HMI sl *)
  - HMI Embedded *)
  - HMI Advanced *)
  - ShopMill / ShopTurn
- Inbetriebnahmehandbuch
  - ADI4
- Listenhandbuch *)
  - Teil 1
  - Teil 2

Funktionshandbuch
- Grundfunktionen *)
- Erweiterungsfunktionen *)
- Sonderfunktionen
- Synchronaktionen
- Funktionshandbuch
  - Werkzeugverwaltung
  - ISO-Dialekte
- Funktionshandbuch
  - Antriebsfunktionen
- Funktionshandbuch
  - Safety Integrated
- EMV-Richtlinien

Elektronische Dokumentation

- DOCONCD *)
- DOCONWEB

*) Empfohlener Minimalumfang der Dokumentation