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SINUMERIK

SINUMERIK 828D PLC

Function Manual

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Valid for

Control
SINUMERIK 828D

CNC software version 5.22

07/2023
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Legal information

Warning notice system

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

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

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

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

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

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We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

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Introduction 1

1.1 About SINUMERIK

From simple, standardized CNC machines to premium modular machine designs – the SINUMERIK CNCs offer the right solution for all machine concepts. Whether for individual parts or mass production, simple or complex workpieces – SINUMERIK is the highly dynamic automation solution, integrated for all areas of production. From prototype construction and tool design to mold making, all the way to large-scale series production.

Visit our website for more information SINUMERIK (https://www.siemens.com/sinumerik).

1.2 About this documentation

Target group

This documentation is intended for project engineers, programmers and commissioning engineers.

Purpose

The SINUMERIK 828D PLC Basic Program is described in this documentation.

The document provides you with an overview of the functions and programming of the SINUMERIK 828D PLC.

Benefits

This documentation enables the target group to implement SINUMERIK 828D PLC projects, taking into account the existing function scope.

Standard scope

This documentation only describes the functionality of the standard version. This may differ from the scope of the functionality of the system that is actually supplied. Please refer to the ordering documentation only for the functionality of the supplied drive system.

It may be possible to execute other functions in the system which are not described in this documentation. This does not, however, represent an obligation to supply such functions with a new control or when servicing.

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

The machine manufacturer must document any additions or modifications they make to the product themselves.

Websites of third-party companies

This document may contain hyperlinks to third-party websites. Siemens is not responsible for and shall not be liable for these websites and their content. Siemens has no control over the information which appears on these websites and is not responsible for the content and information provided there. The user bears the risk for their use.

1.3 Documentation on the internet

1.3.1 Documentation overview SINUMERIK 828D

Comprehensive documentation about the functions provided in SINUMERIK 828D Version 4.8 SP4 and higher is provided in the 828D documentation overview (https://support.industry.siemens.com/cs/ww/en/view/109766724).



You can display documents or download them in PDF and HTML5 format.

The documentation is divided into the following categories:

- User: Operating
- User: Programming
- Manufacturer/Service: Configuring
- Manufacturer/Service: Commissioning
- Manufacturer/Service: Functions
- Manufacturer/Service: Safety Integrated
- SINUMERIK Integrate/MindApp
- Info & Training

1.3.2 Documentation overview SINUMERIK operator components

Comprehensive documentation about the SINUMERIK operator components is provided in the Documentation overview SINUMERIK operator components (https://support.industry.siemens.com/cs/document/109783841/technische-dokumentation-zu-sinumerik-bedienkomponenten?dti=0&lc=en-WW).

You can display documents or download them in PDF and HTML5 format.

The documentation is divided into the following categories:

- Operator Panels
- Machine control panels
- Machine Pushbutton Panel
- Handheld Unit/Mini handheld devices
- Further operator components

An overview of the most important documents, entries and links to SINUMERIK is provided at SINUMERIK Overview - Topic Page (https://support.industry.siemens.com/cs/document/109766201/sinumerik-an-overview-of-the-most-important-documents-and-links?dti=0&lc=en-WW).

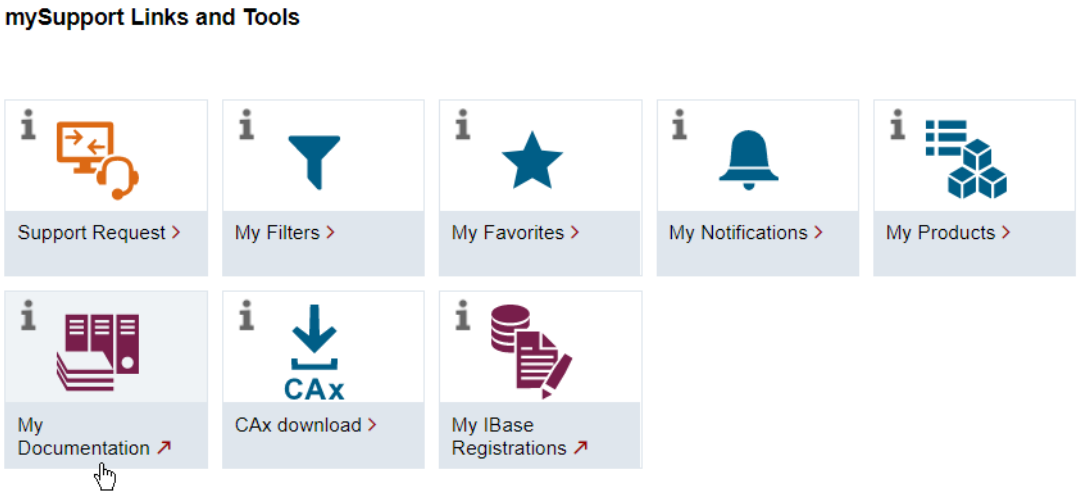
1.4 Feedback on the technical documentation

If you have any questions, suggestions or corrections regarding the technical documentation which is published in the Siemens Industry Online Support, use the link "Send feedback" link which appears at the end of the entry.

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With the "mySupport documentation" web-based system you can compile your own individual documentation based on Siemens content, and adapt it for your own machine documentation.

To start the application, click on the "My Documentation" tile on the "mySupport links and tools" (https://support.industry.siemens.com/cs/ww/en/my) portal page:



The configured manual can be exported in RTF, PDF or XML format.

Note

Siemens content that supports the mySupport documentation application can be identified by the presence of the "Configure" link.

1.6 Service and Support

Product support

You can find more information about products on the internet:

Product support (https://support.industry.siemens.com/cs/ww/en/)

The following is provided at this address:

- Up-to-date product information (product announcements)
- FAQs (frequently asked questions)
- Manuals
- Downloads
- Newsletters with the latest information about your products
- Global forum for information and best practice sharing between users and specialists
- Local contact persons via our Contacts at Siemens database (→ "Contact")
- Information about field services, repairs, spare parts, and much more (→ "Field Service")

Technical support

Country-specific telephone numbers for technical support are provided on the internet at address (https://support.industry.siemens.com/cs/ww/en/sc/4868) in the "Contact" area.

If you have any technical questions, please use the online form in the "Support Request" area.

Training

You can find information on SITRAIN at the following address (https://www.siemens.com/sitrain).
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Siemens support on the go



With the award-winning "Industry Online Support" app, you can access more than 300,000 documents for Siemens Industry products – any time and from anywhere. The app can support you in areas including:

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- Troubleshooting when faults develop
- Expanding a system or planning a new system

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- FAQs
- Application examples
- Manuals
- Certificates
- Product announcements and much more

The "Industry Online Support" app is available for Apple iOS and Android.

1.7 Using OpenSSL

This product can contain the following software:

- Software developed by the OpenSSL project for use in the OpenSSL toolkit
- Cryptographic software created by Eric Young.
- Software developed by Eric Young

You can find more information on the internet:

- OpenSSL (https://www.openssl.org)
- Cryptsoft (https://www.cryptsoft.com)

1.8 Compliance with the General Data Protection Regulation

Siemens observes standard data protection principles, in particular the data minimization rules (privacy by design).

For this product, this means:

The product does not process or store any personal data, only technical function data (e.g. time stamps). If the user links this data with other data (e.g. shift plans) or if he/she stores person-related data on the same data medium (e.g. hard disk), thus personalizing this data, he/she must ensure compliance with the applicable data protection stipulations.

Fundamental safety instructions 2

2.1 General safety instructions

⚠ WARNING

Danger to life if the safety instructions and residual risks are not observed

If the safety instructions and residual risks in the associated hardware documentation are not observed, accidents involving severe injuries or death can occur.

- Observe the safety instructions given in the hardware documentation.
- Consider the residual risks for the risk evaluation.

⚠ WARNING

Malfunctions of the machine as a result of incorrect or changed parameter settings

As a result of incorrect or changed parameterization, machines can malfunction, which in turn can lead to injuries or death.

- Protect the parameterization against unauthorized access.
- Handle possible malfunctions by taking suitable measures, e.g. emergency stop or emergency off.

2.2 Warranty and liability for application examples

Application examples are not binding and do not claim to be complete regarding configuration, equipment or any eventuality which may arise. Application examples do not represent specific customer solutions, but are only intended to provide support for typical tasks.

As the user you yourself are responsible for ensuring that the products described are operated correctly. Application examples do not relieve you of your responsibility for safe handling when using, installing, operating and maintaining the equipment.

2.3 Security information

Siemens provides products and solutions with industrial security functions that support the secure operation of plants, systems, machines and networks.

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens' products and solutions constitute one element of such a concept.

Customers are responsible for preventing unauthorized access to their plants, systems, machines and networks. Such systems, machines and components should only be connected

to an enterprise network or the internet if and to the extent such a connection is necessary and only when appropriate security measures (e.g. firewalls and/or network segmentation) are in place.

For additional information on industrial security measures that may be implemented, please visit
https://www.siemens.com/industrialsecurity.

Siemens' products and solutions undergo continuous development to make them more secure. Siemens strongly recommends that product updates are applied as soon as they are available and that the latest product versions are used. Use of product versions that are no longer supported, and failure to apply the latest updates may increase customer's exposure to cyber threats.

To stay informed about product updates, subscribe to the Siemens Industrial Security RSS Feed under
https://www.siemens.com/cert.

Further information is provided on the Internet:

Industrial Security Configuration Manual (https://support.industry.siemens.com/cs/ww/en/view/108862708)

⚠ WARNING

Unsafe operating states resulting from software manipulation

Software manipulations, e.g. viruses, Trojans, or worms, can cause unsafe operating states in your system that may lead to death, serious injury, and property damage.

- Keep the software up to date.
- Incorporate the automation and drive components into a holistic, state-of-the-art industrial security concept for the installation or machine.
- Make sure that you include all installed products into the holistic industrial security concept.
- Protect files stored on exchangeable storage media from malicious software by with suitable protection measures, e.g. virus scanners.
- On completion of commissioning, check all security-related settings.

Overview

3

3.1 PLC firmware

The PLC of the SINUMERIK 828D is an integrated PLC based on the SIMATIC S7-200 command set.

The PLC user program is essentially programmed using a Windows PC with the "PLC Programming Tool". In addition, the PLC can be diagnosed and edited via the operator interface of the control. A "Ladder-Add-On-Tool" is available in the control for this purpose.

Note the following special features:

- The PLC user program is completely programmed in ladder logic (LAD).
- A subset of the programming language of the S7-200 is supported.
- When loading to the CPU, in addition to the code for execution, the complete project data (including symbols and comments) is loaded into the control. This means that the control always has the project that matches the currently running PLC user program.
- When loading from the CPU, the complete project data (including symbols and comments) is loaded into the PLC Programming Tool and can be processed/edited using this.
- The user must manage the data and process information according to type. The declared data type must be used consistently each time that the data is accessed.

3.2 PLC user interface

The user interface is set up by the PLC firmware, which also organizes the exchange of all signals and data between the PLC on one side and the NC and HMI on the other side.

The user interface comprises the parts:

- Data interface with cyclic exchange (see "Data interface (Page 31)")
- Function interface with function- or task-related data exchange (see "Function interface (Page 51)").

The structured data of these interfaces (retentive and non-retentive) are made available to the user by the firmware by assigning to data blocks: The NC (NC, tool management, NC channel, axes, spindles, ...) and the HMI are "Communication partners" of the PLC user program.

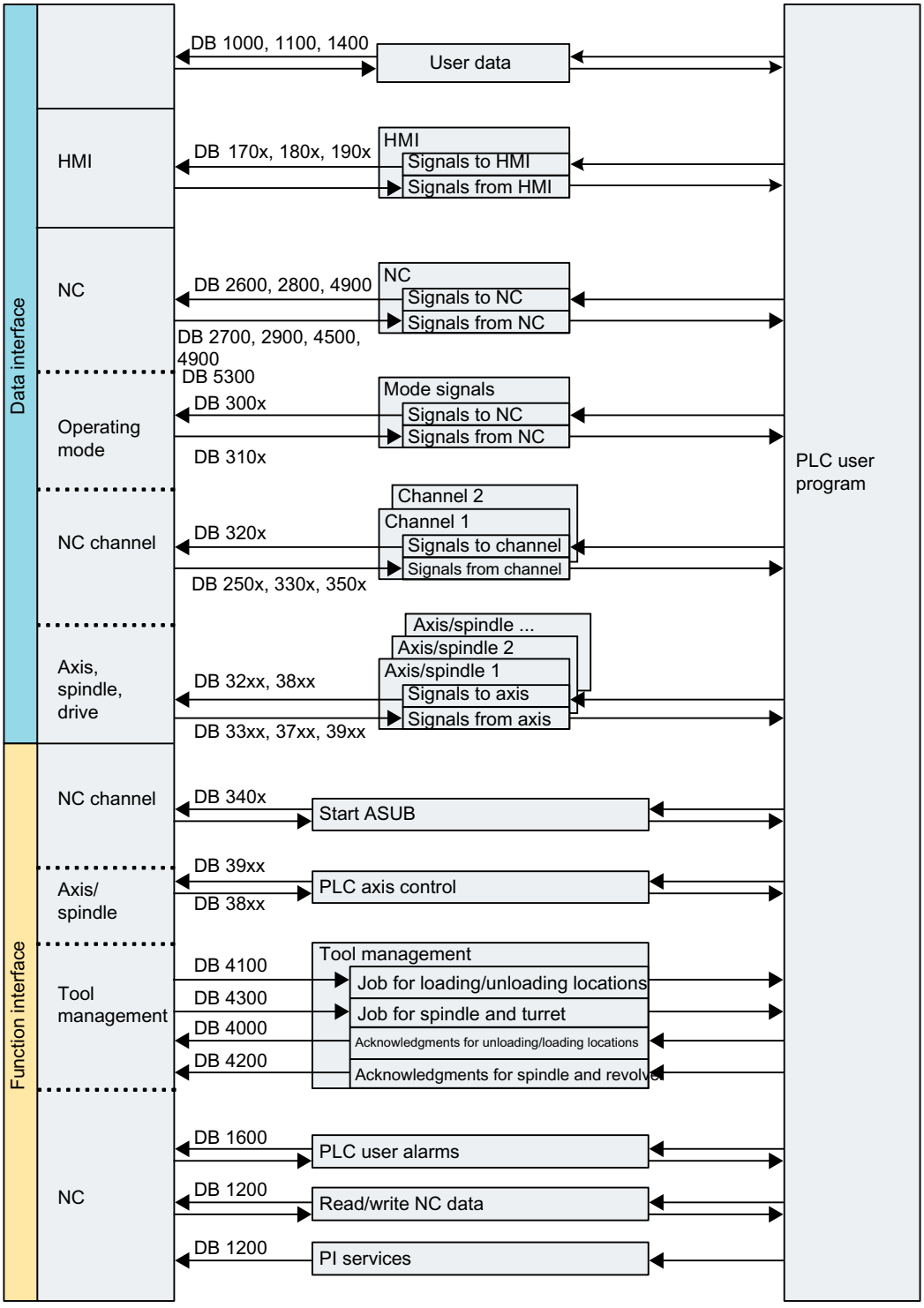


Figure 3-1 Overview of the user interface of the PLC 828D

3.2.1 Data that are cyclically exchanged

Data is exchanged between the PLC and NC on one side as well as between the PLC and HMI on the other side.

Data **to** the PLC is provided by the firmware at the cyclic start of the user program. This ensures, for example, that the signals from the NC remain constant throughout a cycle.

The firmware transfers data **from** the PLC to the NC or HMI at the cycle end of the user program.

PLC ↔ NC interface

The cyclic data includes status signals ("program running", "program interrupted") and control signals (start, stop), and auxiliary and G commands.

Data is structured in signals for:

- Modes
- Channels
- Axes/spindles
- General NC signals

Interface PLC ↔ HMI

These are signals for:

- Program selection via lists
- Messenger control command
- General signals from/to HMI
- Signals from/to the maintenance planner
- Signals from operator panel (retentive area)
- General selection/status signals from/to HMI (retentive area)

3.2.2 Alarms and messages

The user interface in DB1600 offers the option of displaying fault and operating messages on the HMI.

The firmware evaluates the signals that have been entered and sends these as coming and going alarms and messages to the HMI where they are displayed. The HMI manages the fault texts.

Note

A maximum of eight PLC alarms is displayed on the HMI.

3.2.3 Retentive data

For the retentive data there are the user data blocks DB9000 - DB9063 and the data area DB1400.DBB0 - DBB127. There the user can store all data that should remain valid after POWER OFF/ON. The retentive data is stored in the non-volatile memory.

3.2.4 Non-retentive data

Non-retentive data (e.g. bit memories, timers and counters) are deleted every time the control is booted.

3.2.5 PLC machine data

The PLC machine data is located in the NC machine data area. At POWER ON, this data is transferred by the PLC firmware into DB4500 of the PLC user interface where it can be evaluated by the PLC user program.

Further information

SINUMERIK 828D List Manual

3.3 PLC key data

The integrated PLC has a program memory of 24000 PLC statements which are completely executed in one fixed PLC cycle.

Note

Expansion of program memory for PLC instructions

As of V4.94, you can extend the program memory to 32000, 64000 or 100000 PLC instructions via options.

A maximum of 500 statements can be executed in the INT0 interrupt program that can be optionally used. It is executed servo-synchronous and allows the fastest possible reaction to process events. This is the reason why interrupt-capable PLC I/O modules are not required.

Data	Number	Special features
Main program (MAIN)	1	
Subprograms (SBRx)	256	
Interrupts	2	
Time-driven interrupt	1	Servo-synchronous interrupt program
Alarms/messages	1248	A maximum of 8 alarms is displayed.
Bit memory	4096	Non-retentive.
Counters	64	Non-retentive.
Timers, of which:	128	Non-retentive.

Data		Number	Special features
	10 ms increment interval	112	
	100 ms increment interval	16	
User data block each with a max. of 512 bytes		64	Address range DB9000 to DB9063
NC ↔ PLC data transmission			Via fixed parameterizable interface.

3.4 PLC Toolbox

3.4.1 Star/delta changeover

For star/delta changeover, the following block is provided in the PLC Toolbox:

- StarDelta

Note

This block can be used to perform a star/delta changeover - also for 1PH8 spindle motors with SMI connected to a SINAMICS S120.

Fast on-board inputs and outputs

4

For digital input and output signals that must be especially quickly processed by the control system, the PPU module has several interfaces that can be used to directly connect signals:

- Connector X242: 4 input signals, 4 output signals
- Connector X252: 4 input signals, 2 output signals

Interface	I/O signals		Addressing
X242	Inputs:	DIN1 ... DIN4	I256.0 ... I256.3
	Outputs:	DOUT1 ... DOUT 4	Q256.0 ... Q256.3
X252	Inputs:	DIN9 ... DIN12	I256.4 ... I256.7
	Outputs:	DOUT9 ... DOUT 10	Q256.4 ... Q256.5

Response times

This results in the following response times depending on the position control cycle clock, place of execution and digital inputs/outputs that are used:

Processing via:	**Response time** [1]	
• Subprogram SBRx in cyclic operation (MAIN, OB1) • Digital inputs/outputs: **I/O module PP 72/48**		
PU 24x	16 ms	16 ms
PU 26x	14 ms	14 ms
PU 28x	12.5 ms	14 ms
• Servo-synchronous interrupt (INT0) • Direct access commands • Digital inputs/outputs onboard inputs/outputs of the PPU	4 ms	7 ms
[1] Signal at the input terminal → processing in the PLC program → signal at the output terminal		

Read/write access operations

Input/output signals are directly read and written at the module input/outputs. For the fastest possible access (servo-synchronous), use of the direct operation commands in the interrupt program **INT0** is recommended:

Command	Symbol
Direct NO contact	-| I |-
Direct NC contact	-| /I |-
Directly set bit value	-(SI)-
Directly reset bit value	-(RI)-
Directly assign bit value	-(I)-

Parameter assignment

Using machine data, the input/output signals can be exclusively allocated to the NC or the PLC:

- MD10366 $MN_HW_ASSIGN_DIG_FASTIN[<n>]
- MD10368 $MN_HW_ASSIGN_DIG_FASTOUT[<n>]

With <n>: Index for addressing the input/output byte (0 = 1st byte, 1 = 2nd byte, ...)

I/O signals		Assignment	
		NC	PLC
Inputs:	DIN1 ... DIN4	MD10366[0] = 00 01 **01** 01_H	MD10366[0] = 00 01 **00** 01_H
Outputs:	DOUT1 ... DOUT4	MD10368[0] = 00 01 **01** 01_H	MD10368[0] = 00 01 **00** 01_H
Inputs:	DIN9 ... DIN12	MD10366[1] = 00 01 **01** 01_H	MD10366[1] = 00 01 **00** 01_H
Outputs:	DOUT9 ... DOUT10	MD10368[1] = 00 01 **01** 01_H	MD10368[1] = 00 01 **00** 01_H

More information

A detailed specification of the interfaces is provided in:

SINUMERIK 828D PPU Equipment Manual

Ladder Viewer, Ladder Editor, and Ladder add-on tool

5

5.1 Overview

Know-how protection

The PLC user program can be viewed and, if necessary, edited with the Ladder Editor or the Ladder Viewer. The following editing options are possible with the set access levels:

- With the password Manufacturer/Service you can use the Ladder Editor and edit the user program.
- With the password User + Key switch 0, the user program can only be viewed, but not edited (Ladder Viewer).

Note

Adapting access levels

If the access levels to the user program or the Ladder Viewer/Ladder Editor do not sufficiently take into account the know-how protection, it is the manufacturer's responsibility to adapt the access levels:

- Disable the display/editing of program sources
- Show or hide softkeys for editing/display using the Ladder Editor/Viewer
- Protect blocks with block protection against editing

Further information:
A detailed description of setting access levels can be found in the SINUMERIK Operating Manual.

Ladder Viewer

In the Ladder Viewer, the logic operations of contacts and relays in the PLC user program are displayed as a ladder diagram (LAD).

Ladder Editor

The blocks and networks of a PLC project can be edited using the Ladder Editor. All the operations supported by the PLC type are available for editing.

Further information:
A detailed description of the functionality and operation of the Ladder Editor is provided in the SINUMERIK Operating Manual.

Ladder add-on tool

The Ladder add-on tool allows **limited editing of interrupt routines INT100 and INT101 when the Ladder Editor is disabled**. This may be useful, for example, when reassigning inputs and outputs for service or final commissioning tasks when adapting the machine to the actual conditions at the end customer.

Restrictions

The following restrictions apply when editing with the Ladder add-on tool:

- Only empty networks can be edited. Networks, that already include statements, can only be deleted.
- A simple, single line can be edited for each network.
- You can create a maximum of 3 columns per network:

Column	Operation	
Column 1	• NO contact • NC contact	-| |- -|/|-
Column 2 (optional)	NOT Rising edge Falling edge Assign Set Reset	-|NOT|- -|P|- -|N|- -( ) -(S) -(R)
Column 3 (only possible if no assign, set or reset operations were specified in the second column)	Assign Set Reset	-( ) -(S) -(R)

Note

Logical AND (serial contact) and logical OR (parallel contact) are not possible.

The bit combinations comprise one or more logical operations and the assignment to an output / bit memory.

If the cursor is moved further to the left with the arrow key, the type of assignment or a logic operation can be selected. A further logic operation cannot be placed to the right of an assignment. A network must always be terminated with an assignment.

5.2 Parameterization

Display of addresses

Using NC-specific machine data, the display of addresses in the ladder Viewer can be configured according to SIMATIC S7 300 notation:

MD51230 $MN_ENABLE_LADDER_DB_ADDRESSES = <value>

<value>	Meaning
0	Address display in SIMATIC S7 200 notation (e.g. Vxxxxx)
1 (default)	Address display in SIMATIC S7 300 notation (e.g. DBxx.DBBxxxx)

Enabling / locking editing

Editing of the PLC project can be enabled or disabled in the following machine data:

MD51231 $MN_ENABLE_LADDER_EDITOR (PLC Ladder add-on tool activated for INT100/101)

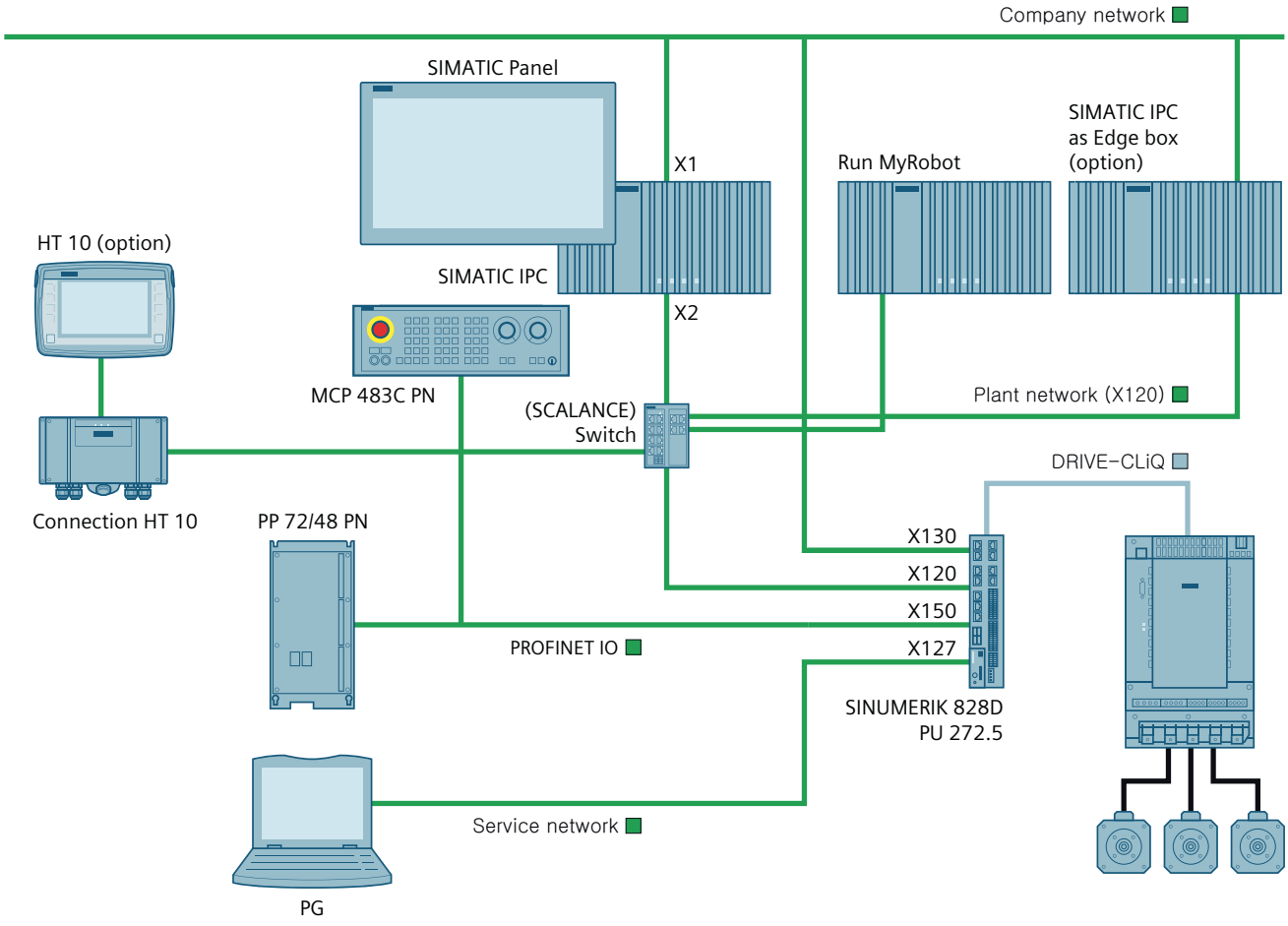
MD51232 $MN_ENABLE_LADDER_EDITOR_ADV (PLC Ladder editor activated for the entire PLC project)

In the default setting, both functions are enabled.

PLC Programming Tool

6

The "PLC Programming Tool" is a tool for writing PLC user programs in a user-friendly fashion. This is a Windows program and must be installed on a Windows PC. For online access to the control, the PC must be connected to the control via one of the Industrial Ethernet ports, X130 (factory network) or X127 (service interface).



When the "PLC Programming Tool" is called, without specifying an existing project, a new project is created with the default name "Project1". This project can be immediately used to generate the PLC user program, saved under any name, and loaded into the control. Existing projects can be opened in the usual Windows manner.

The online help for the "PLC Programming Tool" can also be called with the "F1" function key, just like in Windows.

Further information

- SINUMERIK 828D Turning and Milling Commissioning Manual
- Online help for the PLC Programming Tool

Data interface

7

Data is cyclically exchanged on the one hand between the PLC and NC and on the other hand between the PLC and HMI. This especially means that the data received from HMI and destined for the NC must be marshaled by the user program in order that these become effective.

Data to the PLC is provided by the firmware at the start of the user program cycle. This ensures, for example, that the signals from the NC remain constant throughout a cycle.

Data from PLC is transferred by the firmware to the NC or HMI at the end of the user program cycle.

All data of this interface are listed in the Equipment Manual SINUMERIK 828D PU and Components.

7.1 PLC-NC interface

This cyclic data includes status signals ("program running", "program interrupted"), control signals (start, stop), and auxiliary and G commands.

Data is structured in signals for:

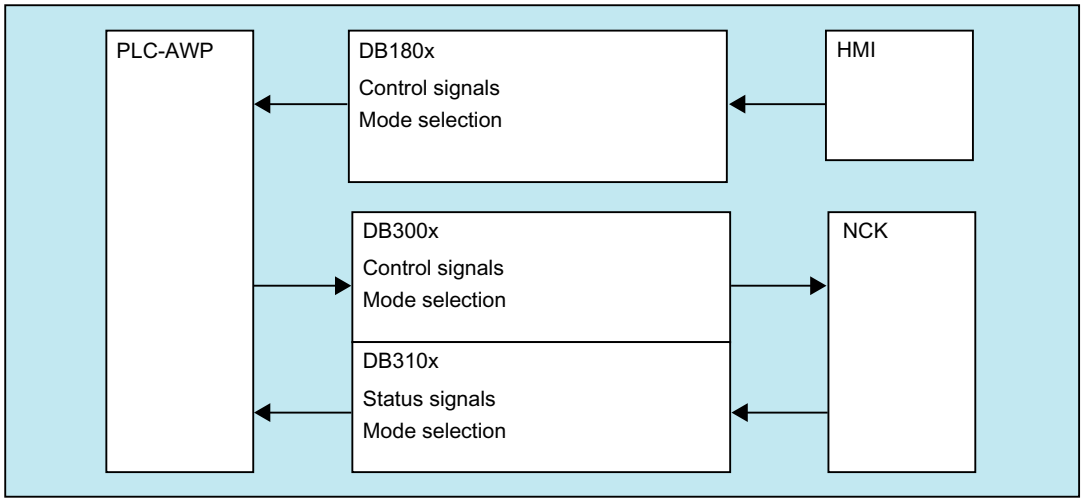
- Mode signals
- NC channel signals
- Axis and spindle signals
- General NC signals
- PLC-NC fast data exchange

7.1.1 Mode signals

DB180x, DB300x, DB310x

The mode signals specified by the machine control panel or the HMI are transferred to the NC.

Their actual states are signaled to the PLC from the NC.

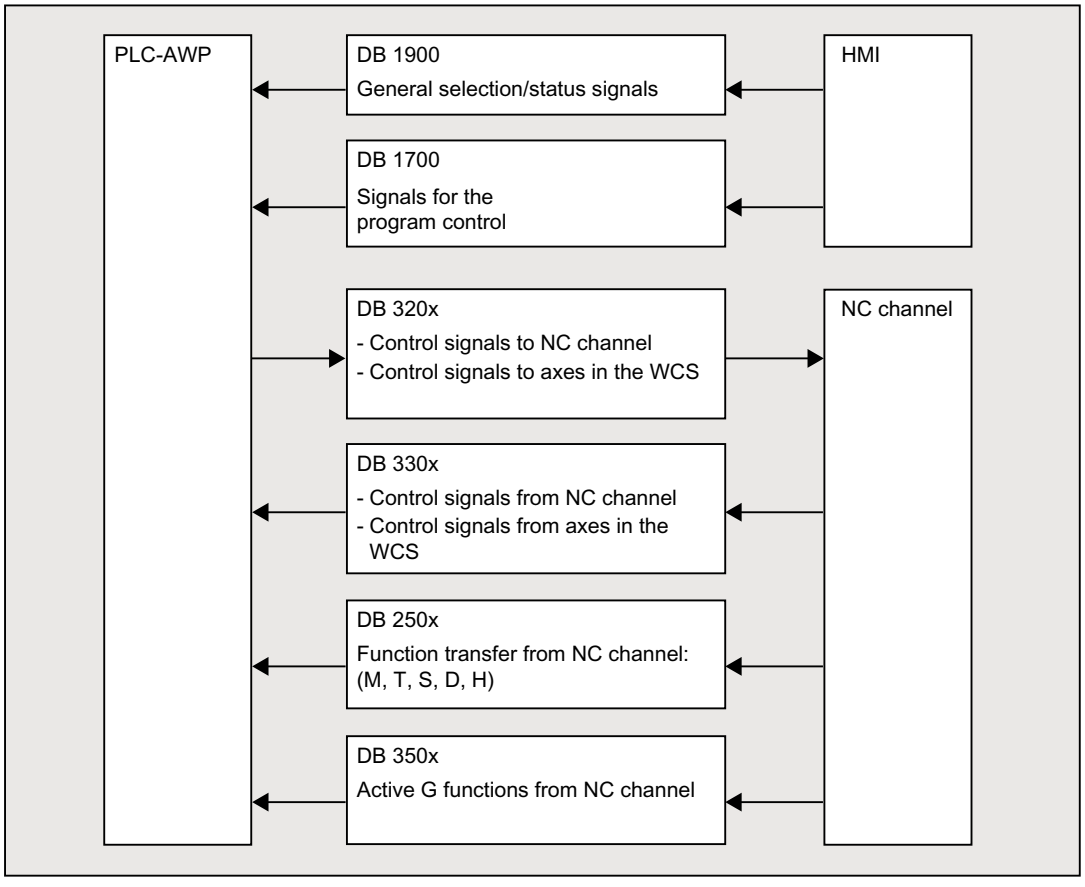

PLC-AWP
DB180x
Control signals
Mode selection
HMI
DB300x
Control signals
Mode selection
NCK
DB310x
Status signals
Mode selection

7.1.2 NC channel signals

DB250x, 320x, 330x, 350x

The signals are structured as follows:

- Control/status signals with normal cyclic transfer, see "Mode signals (Page 31) ".
- Auxiliary and G commands
  These are entered in the interface DBs in two ways.
  First, they are entered with the change signals.
  The M signals M0 to M99 are additionally decoded and the associated interface bits are set for one cycle.
  For G commands, only the groups selected via machine data are entered in the interface data block.
  The S values are also entered together with the related M signals (M03, M04, M05) in the spindlespecific interface. The axisspecific feedrates are also entered in the appropriate axis-specific interface.



7.1.3 Axis and spindle signals

DB370x, 380x, 390x

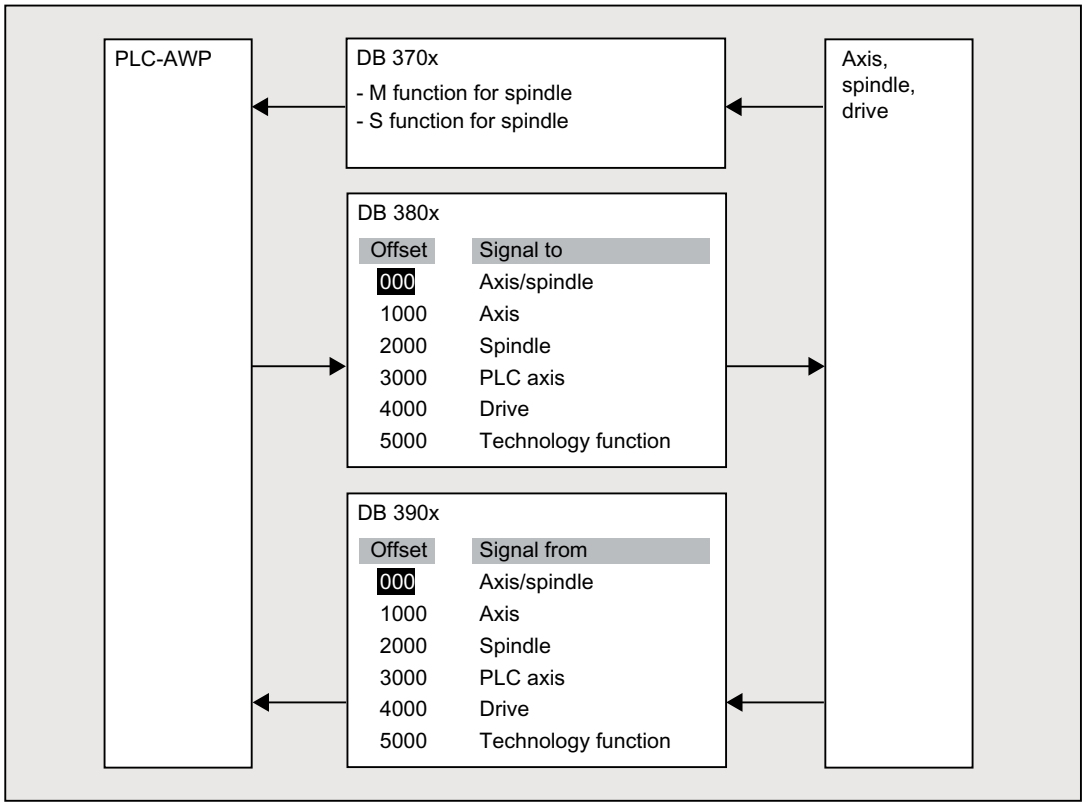
The axis-specific and spindle-specific signals are divided into the following groups:

- Shared axis/spindle signals
- Axis signals
- Spindle signals
- Drive signals

The signals are transferred cyclically with the following exceptions. The exceptions include axial F value, M and S value.

An axial F value is entered via the M, S, F distributor if it is transferred to the PLC during the NC machining process.

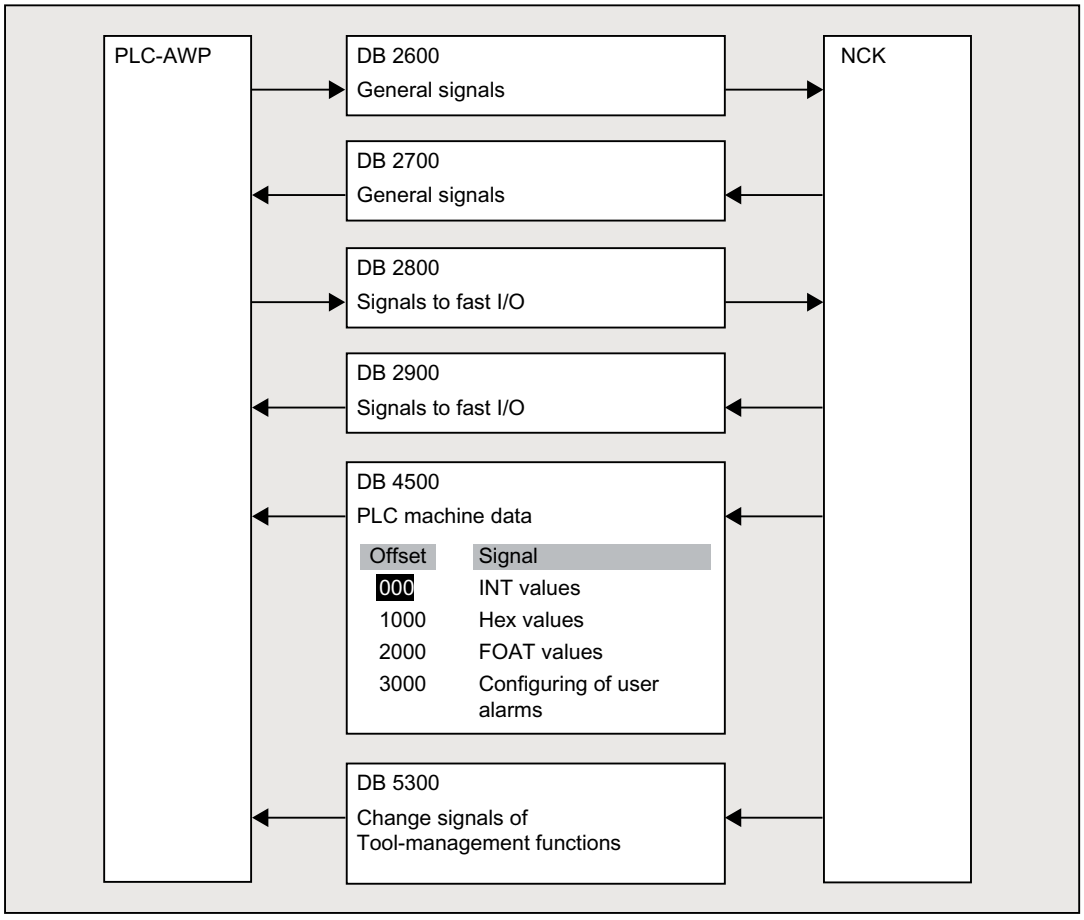
The M and S values are also entered via the M, S, F distributor if one or both values requires processing.



7.1.4 General NC signals

DB2600, 2700, 2800, 2900, 4500, 5300

- Setpoints to digital and analog inputs/outputs of the NC
- Actual values from the digital and analog inputs/outputs of the NC
- Keyswitch and Emergency Stop signals
- Ready and status signals of the NC



7.1.5 PLC-NC fast data exchange

DB4900

Data block DB4900 with a size of 1024 bytes is used for fast information exchange between the PLC and NC.

The assignment of the area (structure) must be identically negotiated in the NC part program and PLC user user program.

This data can be accessed from the NC part program using the commands `$A_DBB[x]`, `$A_DBW[x]`, `$A_DBD[x]` and `$A_DBR[x]; 0 ≤ x ≤ 1023` (see Parameter Manual, System variables).

In this case, the alignment of the data must be selected corresponding to its format, i.e. a Dword starts at a 4byte limit and a word at a 2byte limit. Bytes can be located at any offset within the data field.

Data consistency is guaranteed for byte, word and Dword accesses. When transferring several data, the consistency must be guaranteed on the user-side using semaphores, which can be used to detect the validity or consistency of a block.

7.2 PLC-HMI interface

DB1700, 1800, 1900

These signals have already been specified in the figures of Section PLC-NC interface (Page 31).

A reference is again made to what has been stated at Data interface (Page 31):

Data received from the HMI and destined for the NC are not automatically entered into the NC interface range. In fact, these signals and data must be marshaled by the user program.

It involves the following signals:

- Program selection via lists
- Messenger control command
- General signals from/to HMI
- Signals from/to the maintenance planner
- Signals from operator panel (retentive area)
- General selection/status signals from/to HMI (retentive area)

7.2.1 Program selection

Function

Preselected programs/workpieces can be selected for machining by the NC via the PLC/HMI interface.

The presetting is done by entering programs/workpiece in files, called PLC program lists (*.ppl).

Requirements

The following machine data must be set to allow the HMI to process tasks:

MD9106 $MM_SERVE_EXTCALL_PROGRAMS

In order to activate a sector-specific PLC program list, you must set the appropriate machine data and at least the protection level password:

- Area **user**
  - MD51041 $MN_ENABLE_PROGLIST_USER = 1
  - Protective level password: 3 (users)
  - Program list: /user/sinumerik/hmi/plc/programlist/plc_proglist_user.ppl
- Area **oem**
  - MD51043 $MN_ENABLE_PROGLIST_MANUFACT = 1
  - Protective level password: 1 (manufacturer)
  - Program list: /oem/sinumerik/hmi/plc/programlist/plc_proglist_manufacturer.ppl

Structure of a program list

A program list is a text file. Each line contains the following information:

<program number> <program path><program name> [CH=<channel number>]

- Program number
  The program numbers which may be used in a program list depend on the sector:
  - User: 1 - 100
  - Individual (oem_i): 101 - 200
  - Manufacturer (OEM): 201 - 255
- Program path
  The program path must be completely specified in absolute terms.
  For specifying the program path, see:
  Further information
  Programming Manual NC Programming
- Channel number
  Specifying the channel number "CH=<channel number>" is optional. It is only required if the NC has more than one channel.

The following excerpt as example shows the structure of the user program list:

Program list: plc_proglist_user.ppl

```
1 //DEV2:/MPFDir/PROG_01.MPF CH=1
2 //DEV2:/MPFDir/PROG_01.MPF CH=2
```

Generating entries in a program list

The entries in a program list (*.ppl) can be directly edited in the file or entered in screen forms in the user interface.

- Via the user interface for the **user** area
  Operating area "Program Manager" > "ETC key (">")" > "Prog. list"
- Via the user interface for the **Manufacturer** area
  Operating area "Commissioning" > "System data" > "ETC key (">")" > "Prog. list"

Program selection: Job interface

Note

The PLC may only request a new job if the last job has been acknowledged by the HMI: DB1700.DBB2000 == 0

Program list

DB1700.DBB1001 = <number of the program list>

Number	Program list
129	/user/sinumerik/hmi/plc/programlist/**plc_proglist_user.ppl**
130	/oem_i/sinumerik/hmi/plc/programlist/**plc_proglist_individual.ppl**
131	/oem/sinumerik/hmi/plc/programlist/**plc_proglist_manufacturer.ppl**

Program number

The program number refers to the programs contained in the selected program list.

DB1700.DBB1002 = <program number>

- user area: 1 - 100
- individual area: 101 - 200
- oem area: 201 - 255

Requesting program selection

DB1700.DBX1000.7 = 1

Program selection: Acknowledgment interface

Job acknowledgment

- DB1700.DBX2000.7 == 1 (selection identified)
- DB1700.DBX2000.3 == 1 (program is selected)
- DB1700.DBX2000.2 == 1 (error when selecting the program, see error ID DB1700.DBB2001)
- DB1700.DBX2000.1 == 1 (job completed)

Error code

DB1700.DBB2001 == <error ID>

Error code	
Value	**Meaning**
0	No error.
1	Invalid program list number (DB1700.DBB1001).
3	User-specific program list plc_proglist_main.ppl not found (only for DB1700.DBB1001 ≠ 129, 130, 131).
4	Invalid program number (DB1700.DBB1002).

Error code	
5	The job list in the selected workpiece could not be opened.
6	Error in job list. (Job List Interpreter returns error).
7	Job list interpreter returns empty job list.

Program selection: Job processing

A job to select a program is executed as follows:

1. Checking the acknowledgment byte: DB1700.DBB2000 == 0
   If the acknowledgment byte is not 0, then the last job has still not been completed.
2. Specifying the program list: DB1700.DBB1001
3. Specifying the program number: DB1700.DBB1002
4. Setting the request to select a program: DB1700.DBX1000.7 = 1
5. Evaluating the acknowledgment and error interface: DB1700.DBB2000 and DBB2001
   The order is still not completed on the HMI side as long as: DB1700.DBX2000.3 == 1 (active)
   The order has been completed on the HMI side if one of the two signals has been set:
   - DB1700.DBX2000.1 == 1 == 1 (job completed)
   - DB1700.DBX2000.2 == 1 (error)
6. To complete the order, the program selection request must be reset: DB1700.DBX1000.7 = 0
7. The HMI signals that it is ready to accept a new order by resetting the acknowledgment byte: DB1700.DBB2000 == 0

7.2.2 Operating area numbers

The number of the active operating area is displayed in: DB1900.DBB1

7.2.2.1 Operating area numbers

Operating area	Number
Machine	201
Parameters	205
Programming	203
Program Manager	202
Diagnostics	204
Commissioning	206

7.2.3 Screen numbers

The current screen number is displayed in: DB1900.DBW4

Screen number ranges

The following screen number ranges are available:

- JOG, manual machine (Page 40)
- Reference point approach (Page 45)
- MDA (Page 45)
- AUTOMATIC (Page 45)
- Parameters operating area (Page 46)
- Program operating area (Page 47)
- Program manager operating area (Page 48)
- Diagnostics operating area (Page 48)

7.2.3.1 Screen numbers: JOG, manual machine

JOG mode

Screen	Number
Turning technology	
Cycle start screen for all screens that can be taken over	81
Milling technology	
Cycle start screen for all screens that can be taken over	3
Turning/milling	
Start screen	1900
T,S,M	2
Set WO	21
Positioning	4
Face milling	18
Stock removal	80
Cycle start screen for all user screens	91
General settings	1
Multi-channel function settings	106
Collision avoidance settings	107
Measurement log settings	108
Swiveling	60
All G commands	100
Actual zoom value (MCS/WCS)	101
Thread synchronizing	102
Retract	103
Handwheel	104
Action synchronization	105
Turning technology: Workpiece zero	
Workpiece zero (main menu)	30

Screen	Number
User screen	31
User screen	34
User screen	35
User screen	36
User screen	37
User screen	38
User screen	40
Measure edge Z	5
Turning technology: Workpiece, measurement	
Measure tool (main menu)	50
Manual X or user screen	51
Manual Y	71
Manual Z or user screen	52
Zoom or user screen	53
User screen	54
User screen	55
Probe calibration X or user screen	56
Probe calibration Z or user screen	57
Automatic length in Z	58
Automatic length in Y	73
Automatic length in X	59
Milling technology: Workpiece zero	
Workpiece zero (main menu)	30
Measure edge X	5
Measure edge X	22
Measure edge Z	23
User screen	7
Align edge or user screen	31
Distance 2 edges or user screen	32
Right-angled corner	33
Any corner or user screen	8
Rectangular pocket	34
1 hole or user screen	9
2 holes	35
3 holes	36
4 holes	37
Rectangular spigot	38
1 circular spigot or user screen	10
2 circular spigots	39
3 circular spigots	40
4 circular spigots	41
Set up level	42
Probe length calibration or user screen	11

Screen	Number
Probe radius calibration	12
Milling technology: Workpiece, measurement	
Measure tool (main menu)	50
- Measure length, manual (with milling tool) or - Measure length in X, manual (with turning tool) or - User screen	16
Measure length in Y, manual (with turning tool)	74
Measure length in Z, manual (with turning tool)	24
Measure diameter, manual or user screen	17
- Measure length, automatic (with milling tool) or - Measure length in X, automatic (with turning tool) or - User screen	13
Measure length in Y, automatic (with turning tool)	75
Measure length in Z, automatic (with turning tool)	25
Measure diameter, automatic or user screen	14
User screen	51
Probe calibration or user screen	15
Fixed point calibration or user screen	52
RunMyScreens (only for set JobShopIntegration)	
User screen for the 1st horizontal softkey	96
User screen for the 2nd horizontal softkey	98
User screen for the 3rd horizontal softkey	99
User screen for the 4th horizontal softkey	94
User screen for the 5th horizontal softkey	95
User screen for the 6th horizontal softkey	92
User screen for the 7th horizontal softkey	97
User screen for the 8th horizontal softkey	90
User screen for the 9th horizontal softkey	83
User screen for the 10th horizontal softkey	82
User screen for the 11th horizontal softkey	93
User screen for the 12th horizontal softkey	84
User screen for the 13th horizontal softkey	85
User screen for the 14th horizontal softkey	86
User screen for the 15th horizontal softkey	87
User screen for the 16th horizontal softkey	88

JOG mode, manual machine

DB19.DBB24	
Screen	**Screen number**
Turning/milling	
Taper turning	61
Angle milling	62

DB19.DBB24	
Screen	**Screen number**
Stop	63
Straight line	1300
Straight line all axes	1330
Straight line X alpha	1340
Straight line Z alpha	1350
Circle	1360
Drilling	1400
Center drilling	1410
Drilling, thread centered	1420
Drilling, centering	1433
Drilling, drilling	1434
Drilling, reaming	1435
Drilling, boring	1436
Drilling, deep hole drilling	1440
Drilling, deep hole drilling 2	1441
Drilling, tapping	1453
Drill thread milling	1455
Positions	1473
Position row	1474
Position grid	1477
Position frame	1478
Position circle	1475
Position pitch circle	1479
Obstacle	1476
Turning	1500
Turning, stock removal 1	1513
Turning, stock removal 2	1514
Turning, stock removal 3	1515
Turning, groove 1	1523
Turning, groove 2	1524
Turning, groove 3	1525
Turning, undercut form E	1533
Turning, undercut form F	1534
Turning, undercut thread DIN	1535
Turning, undercut thread	1536
Turning, thread, longitudinal	1543
Turning, thread, taper	1544
Turning, thread, facing	1545
Turning, thread, chain	1546
Turning, cut-off	1550
Milling	1600
Milling, face milling	1610

DB19.DBB24	
Screen	**Screen number**
Milling, rectangular pocket	1613
Milling, circular pocket	1614
Milling, rectangular spigot	1623
Milling, circular spigot	1624
Milling, longitudinal groove	1633
Milling, circumferential groove	1634
Milling, open groove	1635
Milling, multi-edge	1,640
Milling, thread milling	1454
Milling, engraving	1670
Contour turning	1,200
Contour turning, new contour / last contour	1210
Contour turning, stock removal along contour	1220
Contour turning, contour grooving	1230
Contour turning, contour plunge turning	1240
Contour milling	1100
Contour milling, new contour / last contour	1110
Contour milling, path milling	1120
Contour milling, centering	1130
Contour milling, rough drilling	1140
Contour milling, contour pocket	1150
Turning technology: Simulation	
Side view	1740
Front view	1750
3D view	1760
2-window view	1770
Half section	1780
Turning technology: Simultaneous recording	
Side view	1741
Front view	1751
3D view	1761
2-window view	1771
Machine space	1791
Half section	1781
Milling technology: Simulation	
Top view	1742
3D view	1760
From the front	1744
From the rear	1746
From the Left	1748
From the right	1752
Half section	1780

DB19.DBB24	
Screen	**Screen number**
Turning view	1782
Milling technology: Simultaneous recording	
Top view	1743
3D view	1761
From the front	1745
From the rear	1747
From the Left	1749
From the right	1753
Machine space	1791
Half section	1781
Turning view	1783

7.2.3.2 Screen numbers: Reference point approach

Screen	Number
Actual zoom value MCS/WCS	101

7.2.3.3 Screen numbers: MDA

Screen	Number
MDI	20
All G commands	100
Actual zoom value MCS/WCS	101
Handwheel	104
Action synchronization	105
Program control	210
Settings	250

7.2.3.4 Screen numbers: AUTOMATIC

Screen	Number
Automatic	200
Overstore	202
Program control	210
Block search	220
General settings	250
Multi-channel function settings	106
Collision avoidance settings	107
All G commands	100

Screen	Number
Actual zoom value MCS/WCS	101
Handwheel	104
Action synchronization	105
Turning technology: Simultaneous recording	
Side view	243
Front view	244
3D view	245
2-window view	246
Machine space	247
Half section	253
Milling technology: Simultaneous recording	
Top view	242
3D view	244
From the front	248
From the rear	249
From the Left	251
From the right	252
Machine space	247
Half section	253
Turning view	254

7.2.3.5 Screen numbers: Parameters operating area

Screen	Number
Tool list	600
Tool wear	610
User tool list	620
Magazine	630
Work offset	
Work offset, active	642
Work offset, overview	643
Work offset, basic	644
Work offset, G54 - G509	645
Details of work offset, active, overview, basic or G54 - G509	647
User variable	
R parameters	650
Global GUD 1 (SGUD)	660
Global GUD 2 (MGUD)	661
Global GUD 3 (UGUD)	662
Global GUD 4	663
Global GUD 5	664
Global GUD 6	665

Screen	Number
Global GUD 7	666
Global GUD 8	667
Global GUD 9	668
Channel GUD 1 (SGUD)	690
Channel GUD 2 (MGUD)	691
Channel GUD 3 (UGUD)	692
Channel GUD 4	693
Channel GUD 5	694
Channel GUD 6	695
Channel GUD 7	696
Channel GUD 8	697
Channel GUD 9	698
Local LUD	681
Local LUD/PUD	684
Setting data	
Working area limitation	671
Spindle data	670
Spindle chuck data	672
Ctrl-Energy	
Ctrl-Energy, main menu	6170
Ctrl-Energy, analysis	6171
Ctrl-Energy, profiles	6172
Ctrl-Energy, analysis graphic	6176
Ctrl-Energy, analysis long-term measurement	6177
Ctrl-Energy, analysis details	6179
Ctrl-Energy, compare measurements	6178

7.2.3.6 Screen numbers: Program operating area

Screen	Number
Turning technology: Simulation	
Side view	413
Front view	414
3D view	415
2-window view	416
Half section	423
Milling technology: Simulation	
Top view	412
3D view	414
From the front	418
From the rear	419
From the Left	421

Screen	Number
From the right	422
Half section	423
Turning view	424

7.2.3.7 Screen numbers: Program manager operating area

Screen	Number
NC directory	300
Local drive	325
USB / configured drive1	330
Configured drive2	340
Configured drive3	350
Configured drive4	360
Configured drive5	383
Configured drive6	384
Configured drive7	385
Configured drive8	386

7.2.3.8 Screen numbers: Diagnostics operating area

Screen	Number
Alarm list	500
Messages	501
Alarm log	502
NC/PLC variable	503

7.2.4 HMI monitor

Function

The HMI monitor is an 8-byte data area in a freely selectable data block, in which the HMI provides the following data for the PLC user program:

- Operating area numbers (Page 39)
- Screen numbers (Page 39)

Parameterization

The data area is configured using the following display machine data:

MD9032 $MM_HMI_MONITOR = "string"

with "string" = "DB<DB number>.DBB<byte address>"

Note

Even byte address

The data area must start at an even byte address.

Structure of the data area

Byte	Meaning
EB n + 0	Active SINUMERIK operating area
EB n + 1	Reserved
EB n + 2	Current screen number
EB n + 3	
EB n + 4	Reserved
...	...
EB n + 7	Reserved

Supplementary conditions

When the HMI monitoring is active, the following PLC/HMI interface signals are no longer processed:

- DB1900.DBB5003 (PLC hardkeys)
- DB1900.DBB0001 (active SINUMERIK operating area)
- DB1900.DBW0004 (current screen number)

Function interface

8

8.1 Read/write NC variables

8.1.1 User interface

The PLC user program can read or write a maximum of eight NC variables simultaneously via the NC/PLC interface "Read/write NC variable".

The following steps must be performed as part of a job (read/write):

1. Job specification (Page 51)
2. Job management: Start job (Page 53)
3. Job management: Waiting for end of job (Page 53)
4. Job management: Job completion (Page 54)
5. Job evaluation (Page 55)

Flow diagram of a job: See "Job management: Flow diagram (Page 55)"

8.1.2 Job specification

Variable-specific job interface

Each variable that is to be processed in a job, must be specified in the **variable-specific job interface** via its parameters. The general identifiers are discussed in more detail later for each variable that can be accessed from the interface.

DB120x [1]	**Read/write NC data (PLC → NC)**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB1000	Variable index							
DBB1001	Area number							
DBW1002	Line index, NC variable x							
DBW1004	Column index, NC variable x							
DBW1006	---							
DBD1008	Write: Data to NC variable x (data type of the variables: 1...4 bytes)[2]							
DBD1012	---							
DBD1016	Write: Data to NC variable x (REAL) [3]							
DBD1020	Write: Data to NC variable x (DWORD/DINT) [3]							
DBW1024	Write: Data to NC variable x (WORD/INT) [3]							
DBB1026	Write: Data to NC variable x (BYTE) [3]							

DB120x [1]	**Read/write NC data (PLC → NC)**							
DBB1027	---	---	---	---	---	---	---	Write: Data to NC variable x [3]
1) DB120**x**, with x = 0 ... 7 corresponds to variable 1 ... 8.								
2) Only for predefined variables of the "Read/write NC variable" user interface								
3) Only for variables from DB9910 NC_DATA								

Note

Channel-specific variables

When reading/writing channel-specific variables, only the variables of exactly **one** channel may be addressed in a job.

Drive-specific variables

When reading/writing drive-specific variables, only the variables of exactly **one** SERVO drive object may be addressed in a job. The SERVO drive object must be assigned to a machine axis of the NC. The line index corresponds to the logical drive number.

Error case

In the event of an error, reading/writing variables from different drive objects, or simultaneously from a channel and a drive object, an error message is output:

DB1200.DBX3000.1 == 1 (error occurred)

Example: Reading a variable of the "Location type" as the fourth variable

```
DB120x.DBB1000: 7
DB120x.DBB1001: -
DB120x.DBW1002: <Location number>
DB120x.DBW1004: <Magazine number>
DB120x.DBW1006: -
DB120x.DBD1008: -
```

Example: Writing a variable as the fourth variable

To write a data item to the NC, the value must be entered into the double word DBD1008:

```
DB120x.DBB1000: <Variable index>
DB120x.DBB1001: <Area number>
DB120x.DBW1002: <Column index>
DB120x.DBW1004: <Line index>
DB120x.DBW1006: -
DB120x.DBD1008: <Value>
```

8.1.3 Job management: Start job

The following data must be written by the user to the **global job interface**:

DB120x [1)]	Read/write NC data (PLC → NC)							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB0							Job type	Job: Start
DBB1	Number of variables to be processed in the job							
1) DB120**x**, with x = 0 ... 7 corresponds to variable 1 ... 8.								

Job type

- **Read** variable: DB1200.DBX0.1 = **0**
- **Write** variable: DB1200.DBX0.1 = **1**

Start job

The start signal must be set to start the job via a specified number of variables:

DB1200.DBX0.0 = **1**

Note

A new job can only be started if the previous job was completed. See Section "Job management: Waiting for end of job (Page 53)".

The execution of a job may take several PLC cycles and vary depending on the utilization. Therefore, the time for this function cannot be defined.

8.1.4 Job management: Waiting for end of job

The end of the job is always signaled back by the NC for the **whole** job in the **global result interface**. The signals can only be read by the PLC user.

DB120x [1)]	Read/write NC data (NC → PLC)							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB2000							Error in job	Job completed
1) DB120**x**, with x = 0 ... 7 corresponds to variable 1 ... 8.								

Job status

- End of job without error
  DB1200.DBX2000.0 == **1 AND** DB1200.DBX2000.1 == **0**
- End of job with error
  DB1200.DBX2000.0 == **1 AND** DB1200.DBX2000.1 == **1**

Possible error causes

- Number of variables (DB1200.DBB1) out of the valid range
- Variable index (DB1200.DBB1000) out of the valid range
- Simultaneous reading/writing of NC data from different servo drive objects

8.1.5 Job management: Job completion

Requirement

In order to complete the job, the start signal of the job must be reset from the PLC user program after detection of the end of the job:

DB1200.DBX0.0 = **0**

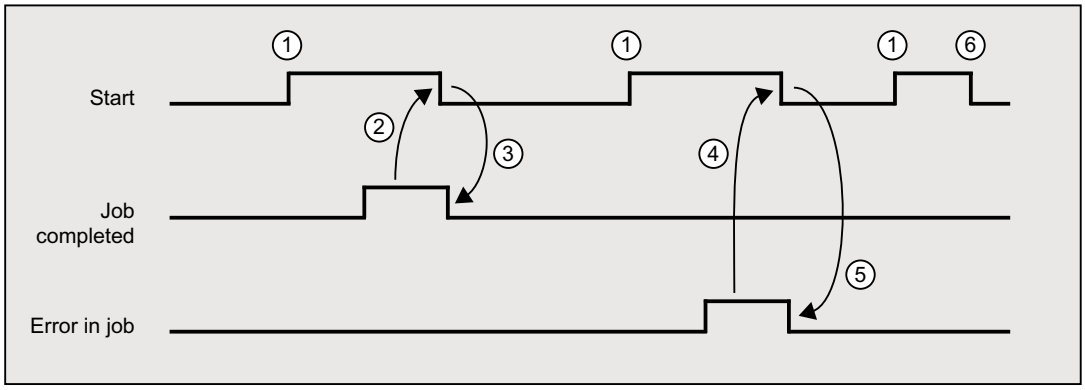
Feedback signal

As feedback, the NC resets the status signals:

- DB1200.DBX2000.0 == **0**
- DB1200.DBX2000.1 == **0**

The job is now completed.

8.1.6 Job management: Flow diagram



① Start job:
DB1200.DBX0.0 (start) = 1

② Waiting for end of job:
DB1200.DBX2000.0 (job completed) == **1** AND
DB1200.DBX2000.1 (error in job) == **0**

⇒ Reset job request:
DB1200.DBX0.0 = 0 (start)

③ With DB1200.DBX0 0 == 0 (start), the job is completed by the basic PLC program:
DB1200.DBX2000.0 (job completed) = 0

④ Waiting for end of job:
DB1200.DBX2000.0 (job completed) == **0** AND
DB1200.DBX2000.1 (error in job) == **1**

⇒ Perform error handling

⇒ Reset job request:
DB1200.DBX0.0 (start) = 0

⑤ With DB1200.DBX0.0 == 0 (start), the job is completed by the basic PLC program:
DB1200.DBX2000.1 (error in job) = 0

⑥ If DB1200.DBX0.0 (start) is reset before the end of job is signaled by the basic PLC program, the job is executed without further feedback.

8.1.7 Job evaluation

The variable-specific result interface must be evaluated for each variable processed in the job.

DB120x [1]	**NC services (NC → PLC)**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB3000							Error has occurred	Variable valid
DBB3001	Access result (see "Access result" below)							
DBW3002	---							
DBD3004	Read: Data from NC variable x (data type of the variables: 1...4 bytes) [2]							
DBD3008	---							
DBD3012	---							

DB120x [1]	NC services (NC → PLC)							
DBD3016	Read: Data from NC variable x (REAL) [3]							
DBD3020	Read: Data from NC variable x (DWORD / DINT) [3]							
DBW3024	Read: Data from NCK variable x (WORD / INT) [3]							
DBB3026	Read: Data from NCK variable x (BYTE) [3]							
DBB3027	---	---	---	---	---	---	---	Read: Data from NC variable x [3]

1) DB120**x**, with x = 0 ... 7 corresponds to variable 1 ... 8.

2) Only for predefined variables of the "Read/write NC variable" user interface

3) Only for variables from DB9910 NC_DATA

Note

Channel-specific variables

When reading/writing channel-specific variables, only the variables of exactly **one** channel may be addressed in a job.

Drive-specific variables

When reading/writing drive-specific variables, only the variables of exactly **one** SERVO drive object may be addressed in a job. The SERVO drive object must be assigned to a machine axis of the NC. The line index corresponds to the logical drive number.

Error case

In the event of an error, reading/writing variables from different drive objects, or simultaneously from a channel and a drive object, an error message is output:

DB1200.DBX3000.1 == 1 (error occurred)

Access result

NC variables

DBB3001	
Value	**Meaning**
0	No error
3	Access to object is not permitted
5	Invalid address
10	Object does not exist

Drive-specific variables

If an error occurs while reading/writing a drive-specific variable (DB1200.DBX3000.1 == 1), an error number is displayed in the access result which is based on the error numbers defined in the PROFIdrive profile.

DBB3001	
Value	**Meaning**
x	<Error number of PROFIdrive profile> + 20_H or 36_D

Determining the significance of the access result:

1. Calculation of the error number of the PROFIdrive profile
   <Error number of PROFIdrive profile> = result of access - 20_H or 36_D.
2. Determining the significance of the error number of the PROFIdrive profile
   The error numbers of the PROFIdrive profile are described in:
   Further information
   Function Manual Drive Functions SINAMICS S120

Examples: Job status

Job without error

- DB1200.DBX3000.0 == 1 (variable valid) **AND**
- DB1200.DBX3000.1 == 0 (no error occurred)

Result:

- DB1200.DBB3001 == 0 (access result: "No error")
- DB1200.DBD3004 == <read value>

Job with error

- DB1200.DBX3000.0 == 0 (variable not valid) **AND**
- DB1200.DBX3000.1 == 1 (error occurred)

Result:

- DB1200.DBB3001: For possible error causes, see "Access result" above

8.1.8 Operable variables

The following variables are available:

Variable	Meaning
cuttEdgeParam (Page 58)	Compensation value parameters and cutting edge list with D numbers for a tool
numCuttEdgeParams (Page 58)	Number of P elements of a cutting edge
linShift (Page 59)	Translation of a settable zero-point offset
numMachAxes (Page 59)	Number of the highest existing channel axis

Variable	Meaning
rpa (Page 60)	R parameters
actLineNumber (Page 60)	Line number of the current NC block
$TC_MPPx (Page 60)	Magazine location data
r0078[1] (Page 61)	Current actual value, torque-generating
r0079[1] (Page 62)	Torque setpoint at the output of the speed controller
r0081 (Page 62)	Torque utilization in percent
r0082[1] (Page 62)	Active power actual value
TEMP_COMP_x (Page 63)	Temperature compensation data

8.1.8.1 Variable "cuttEdgeParam"

Compensation value parameters and cutting edge list with D numbers for a tool

The meanings of the individual parameters depend on the type of the tool in question. Currently, 25 parameters are reserved for each tool edge (but only a part of them is loaded with values). To be able to remain flexible for future extensions, it is not recommended to use a fixed value of 25 parameters for calculation, but the variable value 'numCuttEdgeParams' (variable index 2).

A detailed description of the tool parameters can be found in the "Tools" Function Manual.

Address	Value / meaning
DB120x.DBB1000	1
DB120x.DBB1001	-
DB120x.DBW1002	(Cutting edge No. - 1) * numCuttEdgeParams + ParameterNo (WORD)
DB120x.DBW1004	T number (1...32000) (WORD)
DB120x.DBD1008	**Write**: Data to NC variable x (data type: REAL)
DB120x.DBW3004	**Read**: Data from NC variable x (data type: REAL)

8.1.8.2 Variable "numCuttEdgeParams"

Number of P elements of a cutting edge

Address	Value / meaning
DB120x.DBB1000	2
DB120x.DBB1001	-
DB120x.DBW1002	-
DB120x.DBW1004	-
DB120x.DBD1008	-
DB120x.DBW3004	**Reading**: Data from NCK variable x (data type: WORD)

8.1.8.3 Variable "linShift"

Translation of a settable work offset (channel-specific settable frames)

The variable only exists if MD18601 MM_NUM_GLOBAL_USER_FRAMES > 0.

The following frame indices are available:

Index	Meaning
0	ACTFRAME = actual resulting work offset
1	IFRAME = actual settable work offset
2	PFRAME = actual programmable work offset
3	EXTFRAME = actual external work offset
4	TOTFRAME = actual total work offset = total of ACTFRAME and EXTFRAME
5	ACTBFRAME = actual total base frame
6	SETFRAME = current 1st system frame (PRESET, scratching)
7	EXTFRAME = current 2nd system frame (PRESET, scratching)
8	PARTFRAME = current 3rd system frame (TCARR and PAROT with an orientable toolholder)
9	TOOLFRAME = current 4th system frame (TOROT and TOFRAME)
10	MEASFRAME = result frame for the workpiece and tool measuring
11	WPFRAME = current 5th system frame (workpiece reference points)
12	CYCFRAME = current 6th system frame (cycles)

Address	Value / meaning
DB120x.DBB1000	3
DB120x.DBB1001	-
DB120x.DBW1002	Frame index * numMachAxes (Page 59) + axis number
DB120x.DBW1004	-
DB120x.DBD1008	-
DB120x.DBW3004	**Read**: Data from NC variable x (data type: REAL)

8.1.8.4 Variable "numMachAxes"

Number of the highest existing channel axis

If there are no channel axis **gaps**, the value of the variables is also the number of available axes in the channel.

Address	Value / meaning
DB120x.DBB1000	4
DB120x.DBB1001	-
DB120x.DBW1002	-
DB120x.DBW1004	-
DB120x.DBD1008	-
DB120x.DBW3004	**Read**: Data from NC variable x (data type: WORD)

8.1.8.5 Variable "rpa"

R parameters

Address	Value / meaning
DB120x.DBB1000	5
DB120x.DBB1001	-
DB120x.DBW1002	R number + 1
DB120x.DBW1004	-
DB120x.DBD1008	**Write**: Data to NC variable x (data type: REAL)
DB120x.DBW3004	**Read**: Data from NC variable x (data type: REAL)

8.1.8.6 Variable "actLineNumber"

Line number of the current NC block

No.	Meaning
≥ 1	Line number of the current NC block
0	No line number available because the program has not started
-1	No line number available: Error
-2	No line number available: Suppression of block display with `DISPLOF` is active

Address	Value / meaning
DB120x.DBB1000	6
DB120x.DBB1001	-
DB120x.DBW1002	-
DB120x.DBW1004	-
DB120x.DBD1008	-
DB120x.DBW3004	**Read**: Data from NC variable x (data type: INT)

8.1.8.7 Tool management: Magazine location data

Location type ($TC_MPP2)

Address	Value / meaning
DB120x.DBB1000	7
DB120x.DBB1001	-
DB120x.DBW1002	Location number (1 ... 31999)
DB120x.DBW1004	Magazine number (1 ... 9999)
DB120x.DBD1008	-

Address	Value / meaning		
DB120x.DBW3004	**Read**: Value of the NC variable (data type: WORD)		
		Value	**Meaning**
		> 0	Location type for virtual location
		0	"match all" (buffer)
		9999	undefined (no virtual location)

Location status ($TC_MPP4)

Address	Value / meaning		
DB120x.DBB1000	8		
DB120x.DBB1001	-		
DB120x.DBW1002	Location number (1 ... 31999)		
DB120x.DBW1004	Magazine number (1 ... 9999)		
DB120x.DBD1008	-		
DB120x.DBW3004	**Read**: Value of the NC variable (data type: WORD)		
		Value	**Meaning**
		1	Blocked
		2	free (<> occupied)
		4	reserved for tool in buffer
		8	reserved for tool to be loaded
		16	occupied in left half location
		32	occupied in right half location
		64	occupied in upper half location
		128	occupied in lower half location

T No. of tool at this location ($TC_MPP6)

Address	Value / meaning
DB120x.DBB1000	9
DB120x.DBB1001	-
DB120x.DBW1002	Location number (1 ... 31999)
DB120x.DBW1004	Magazine number (1 ... 9999)
DB120x.DBD1008	-
DB120x.DBW3004	**Read**: T number of the tool at this location (data type: WORD)

8.1.8.8 Variable r0078[1]

- Drive object: SERVO, SERVO_AC, SERVO_I_AC
- CO: Current actual value, torque-generating [A_{rms}]
- Index [1]: smoothed with p0045

Address	Value / meaning
DB120x.DBB1000	10
DB120x.DBB1001	Number of the drive module
DB120x.DBW1002	-
DB120x.DBW1004	-
DB120x.DBD1008	-
DB120x.DBW3004	**Read**: Data from NC variable x (data type: REAL)

8.1.8.9 Variable r0079[1]

- Drive object: SERVO, SERVO_AC, SERVO_I_AC
- CO: Torque setpoint at the output of the speed controller (before clock cycle interpolation) [Nm]
- Index [1]: smoothed with p0045

Address	Value / meaning
DB120x.DBB1000	11
DB120x.DBB1001	Number of the drive module
DB120x.DBW1002	-
DB120x.DBW1004	-
DB120x.DBD1008	-
DB120x.DBW3004	**Read**: Data from NC variable x (data type: REAL)

8.1.8.10 Variable r0081

- Drive object: SERVO, SERVO_AC, SERVO_I_AC
- CO: Torque utilization in percent

Address	Value / meaning
DB120x.DBB1000	12
DB120x.DBB1001	Number of the drive module
DB120x.DBW1002	-
DB120x.DBW1004	-
DB120x.DBD1008	-
DB120x.DBW3004	**Read**: Data from NC variable x (data type: REAL)

8.1.8.11 Variable r0082[1]

- Drive object: SERVO, SERVO_AC, SERVO_I_AC
- CO: Active power actual value [kW]
- Index [1]: smoothed with p0045

Address	Value / meaning
DB120x.DBB1000	13
DB120x.DBB1001	Number of the drive module
DB120x.DBW1002	-
DB120x.DBW1004	-
DB120x.DBD1008	-
DB120x.DBW3004	**Read**: Data from NC variable x (data type: REAL)

8.1.8.12 Temperature compensation

Variable "TEMP_COMP_ABS_VALUE" (SD43900)

Position-independent temperature compensation value

Address	Value / meaning
DB120x.DBB1000	14
DB120x.DBB1001	No. of the axis (1, 2, ...)
DB120x.DBW1002	-
DB120x.DBW1004	-
DB120x.DBD1008	Write: Data to NC variable x (data type: REAL)
DB120x.DBW3004	Read: Data from NC variable x (data type: REAL)

Variable "TEMP_COMP_SLOPE" (SD43910)

Gradient for position-dependent temperature compensation

Address	Value / meaning
DB120x.DBB1000	15
DB120x.DBB1001	No. of the axis (1, 2, ...)
DB120x.DBW1002	-
DB120x.DBW1004	-
DB120x.DBD1008	**Write**: Data to NC variable x (data type: REAL)
DB120x.DBW3004	**Read**: Data from NC variable x (data type: REAL)

Variable "TEMP_COMP_REF_POSITION" (SD43920)

Reference position for position-dependent temperature compensation

Address	Value / meaning
DB120x.DBB1000	16
DB120x.DBB1001	No. of the axis (1, 2, ...)
DB120x.DBW1002	-
DB120x.DBW1004	-
DB120x.DBD1008	**Write**: Data to NC variable x (data type: REAL)
DB120x.DBW3004	**Read**: Data from NC variable x (data type: REAL)

Variable "TOOL_TEMP_COMP" (SD42960[...])

Temperature compensation referred to the tool

Address	Value / meaning
DB120x.DBB1000	17
DB120x.DBB1001	-
DB120x.DBW1002	Index + 1 (1, 2, 3)
DB120x.DBW1004	-
DB120x.DBD1008	**Write**: Data to NC variable x (data type: REAL)
DB120x.DBW3004	**Read**: Data from NC variable x (data type: REAL)

8.1.9 Specifying selected NC variables

The selected NC variables are specified via the data blocks DB9910, DB9911, DB9912 (selected NC variables). The length of the data block depends on the number of NC variables selected in the variables list. The variables list can contain maximum 126 selected NC variables. The data blocks DB9910, DB9911, DB9912 contain the data for variable addressing and data type conversion for each NC variable.

DB991x	Selected NC variable, read (PLC → NC)							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB0	Variable index **Variable 1**							
DBB1	Syntax ID							
DBB2	Area							
DBB3	Unit							
DBW4	Column index							
DBW6	Line index							
DBB8	Block							
DBB9	Number of lines							
DBB10	Type							
DBB11	Length							
....	.....							
DBB492	Variable index **Variable 42**							
DBB493	Syntax ID							
DBB494	Area							
DBB495	Unit							
DBW496	Column index							
DBW498	Line index							
DBB500	Block							
DBB501	Number of lines							
DBB502	Type							
DBB503	Length							

Variable index

The variable index refers to the name of the NC variable. The variable index consists of a start value 100 and the offset of the NC variable in the list (0 to 125).

The variable index is entered as DBB1000 A_VarIdx in the DB120x RW_NCDx user interface.

The comment contains the following data record with space as separator:

- Area
- Block
- VariablenName
- VarType
- Column
- VarAnzByte

Extended user interface

The data test in data blocks means the value of a variable can be written to an address in the data block that has the same type, e.g. a REAL value can be written only to a REAL address (e.g. with MOV_R). The "Read/write NC variable " user interface contains currently only one address of the DWORD type for the value to be written (DBD1008). This means a REAL value can be written only via a temporary variable, flag or accumulator. The same is also true for reading (DBD3004). For this reason, the "Read/write NC variable" user interface is extended. For reading and writing, one address for each type is added: REAL, DWORD/DINT, WORD/INT, BYTE and BOOL (DBD1016 ... DBB1027 or DBD3016 ... DBB3027). These new addresses are used by the PLC firmware only for those variables selected with the NC variables editor – and entered into DB9910 NC_DATA when compiled (variable index ≥ 100). The NC variables currently defined in the "Read/write NC variable" user interface continue to use the old addresses (DBD1008 or DBD3004).

8.2 Program invocation services (PI Services)

8.2.1 Job specification

PI services are specified via the **job interface** (DB1200 from offset 4000).

DB1200			**PI service [r/w]**					
			PLC → NC interface					
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB 4000	-	-	-	-	-	-	-	Start [1]
DBB 4001	PI index [2]							
DBB 4002	-							
DBB 4003	-							
DBW 4004	PI parameter 1 [3]							
DBW 4006	PI parameter 2							

DB1200	PI service [r/w]
DBW 4008	PI parameter 3
DBW 4010	PI parameter 4
DBW 4012	PI parameter 5
DBW 4014	PI parameter 6
DBW 4016	PI parameter 7
DBW 4018	PI parameter 8
DBW 4020	PI parameter 9
DBW 4022	PI parameter 10
1) DB1200.DBX4000.1, start: DBX4000.1 = 1 ⇒ start of the PI service; DBX4000.1 = 0 ⇒ PI service completed	
2) DB1200.DBB4001, PI index: Specifies the specific PI service	
3) DB1200.DBW4004 ..., PI parameters: PI-specific parameters	

Overview of the PI services:

- PI service ASUB (Page 67)
- PI service LOGOUT (Page 69)
- PI service DATA_SAVE (Page 69)
- PI service TMMVTL (Page 69)

8.2.2 Job feedback

The PLC provides feedback as to whether the started PI service was successful or not successful in the **result interface** (DB1200 from offset 5000).

The job end is signaled using the following signals:

- DB1200.DBX5000.0
- DB1200.DBX5000.1

The signals are written by the PLC; therefore, they can only be read by the user.

A job has been completed as soon as the user resets the "Start" signal (DB1200.DBX4000.1). Status signals DB1200.DBX5000.0 and .1 are then set to zero.

DB1200			PI service [r]					
			NCK → PLC interface					
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB 5000	-	-	-	-	-	-	Error in the job [2]	Job completed [1]
DBB 5001	-							
DBB 5002	-							
1) DB1200.DBX5000.0, job status: DBX5000.0 == 1 ⇒ job completed								
2) DB1200.DBX5000.1, error status: DBX5000.1 == 0 ⇒ no error; DBX5000.1 == 1 ⇒ error								

Possible error causes

- The index of the parameterized PI service (DB1200.DBB4001) is outside the valid range
- Parameter error

8.2.3 PI service ASUB

Interrupts

Note

Relationship between channels and interrupts

For control systems with maximum **one** channel, **two** interrupts are available; for control systems with maximum **two** channels, **four** interrupts are available, and for control systems with maximum **four** channels, **eight** interrupts are available.

Every interrupt number can be assigned an interrupt program (ASUB) with the "ASUB" PI service from the PLC. The interrupt program is then executed on the NC when the associated interrupt is issued. The associated interrupt programs must be present in the NC in the machine manufacturer directory (_N_CMA_DIR) with the following program names:

Interrupt	Program name
1	PLCASUP1_SPF
2	PLCASUP2_SPF
3	PLCASUP3_SPF
4	PLCASUP4_SPF
5	PLCASUP5_SPF
6	PLCASUP6_SPF
7	PLCASUP7_SPF
8	PLCASUP8_SPF

If the interrupt programs are not available, they must be created. An NC Reset (Power On) must then be issued on the NC.

The PI service "ASUP" must only be executed once per interrupt assignment after the control powers up. The assignment of the interrupt to the interrupt program is retained until the control powers up again.

Job specification

PI service: ASUB		
Address	**Description**	**Valid values**
DB1200.DBW4001	PI index [1)]	1, 2, 13, 14
DB1200.DBW4004	Parameter 1: LIFTFAST [2)]	0 (FALSE), 1 (TRUE)
DB1200.DBW4006	Parameter 2: BLSYNC [3)]	0 (FALSE), 1 (TRUE)
DB1200.DBW4008	Parameter 3: Channel index [4)]	0, 1
DB1200.DBW4010	Parameter 4: Interrupt priority [5)]	0, 1, 2, 3, 4

PI service: ASUB		
Address	**Description**	**Valid values**
1) • PI index = 1: Interrupt 1 ⇒ _N_CMA_DIR / PLCASUP1_SPF, interrupt priority set as default: 1 • PI index = 2: Interrupt 2 ⇒ _N_CMA_DIR / PLCASUP2_SPF, interrupt priority set as default: 2 • PI index = 13: Interrupt 3 ⇒ _N_CMA_DIR / PLCASUP3_SPF, interrupt priority set as default: 3 • PI index = 14: Interrupt 4 ⇒ _N_CMA_DIR / PLCASUP4_SPF, interrupt priority set as default: 4 • PI index = 15: Interrupt 1 ⇒ _N_CMA_DIR / PLCASUP5_SPF, interrupt priority set as default: 5 • PI index = 16: Interrupt 2 ⇒ _N_CMA_DIR / PLCASUP6_SPF, interrupt priority set as default: 6 • PI index = 17: Interrupt 3 ⇒ _N_CMA_DIR / PLCASUP7_SPF, interrupt priority set as default: 7 • PI index = 18: Interrupt 4 ⇒ _N_CMA_DIR / PLCASUP8_SPF, interrupt priority set as default: 8		
2) After the interrupt has been initiated, LIFTFAST first results in a fast retraction. Only then is the interrupt routine executed. **Further information** Function Manual Axes and Spindles		
3) BLSYNC ensures that after the interrupt has been initiated, the system first waits until the actual block has been executed. Only then is the interrupt routine executed.		
4) 0 → channel 1, 1 → channel 2		
5) When using default interrupt priorities, the parameter should be set to a value of 0.		

Machine data

- Lowest interrupt priority
  In the following machine data, the lowest interrupt priority for the NC is defined, whose associated interrupt is processed. Interrupts with a lower priority than that specified in the machine data are not processed in the control system:
  MD11604 $MN_ASUP_START_PRIO_LEVEL

Supplementary conditions

Channel status

The PI service "ASUB" may only be executed when the channel in which it is requested is in the "reset" state.

ProgEvent "Power up"

If, for an event-driven program call (ProgEvent), "power up" is configured as initiating event (MD20108 $MC_PROG_EVENT_MASK), then the PI service "ASUP" may only be started after the ProgEvent program has been completed (PROG_EVENT_SPF or MD11620 $MN_PROG_EVENT_NAME = <user_prog_event_SPF>).

See also

Job specification (Page 65)

Job feedback (Page 66)

8.2.4 PI service LOGOUT

Function

The password last transferred to the NC is reset.

Job specification

PI service: LOGOUT		
Address	**Description**	**Valid values**
DB1200.DBW4001	PI index	3 (reset password)

8.2.5 PI service DATA_SAVE

Function

Save the current NC state to the system CompactFlash card.

Note

Power up

The next time that the controller powers up, in the "Start up menu" via "Reload saved user data", the saved state can be loaded to the NC.

Job specification

PI service: DATA_SAVE		
Address	**Description**	**Valid values**
DB1200.DBW4001	PI index	4

Further information

SINUMERIK 828D Commissioning Manual

8.2.6 PI service TMMVTL

Function

Using the PI service TMMVTL, it is possible to request a job from the PLC to relocate a tool. As a result of the PI service, the tool manager carries out an empty location search in the target magazine for the tool specified in the PI service (tool number or source location number/source magazine number) The PLC then receives a job to relocate the tool via DB41xx.DBB0.

Job specification

Address	Description	Valid values
DB1200.DBW4001	PI index	5
DB1200.DBW4004	Parameter 1: Tool number [1)]	-1, 1 ... 31999
DB1200.DBW4006	Parameter 2: Source location number [1)]	-1, 1 ... 31999
DB1200.DBW4008	Parameter 3: Source magazine number [1)]	-1, 1 ... 9999
DB1200.DBW4010	Parameter 4: Target location number [2)]	-1, 1 ... 31999
DB1200.DBW4012	Parameter 5: Target magazine number [3)]	-1, 1 ... 9999

1) The tool can be optionally specified using:

- Tool number (T number)
- Source location and source magazine number

For the unused parameters of the other version, a value of -1 must be entered.

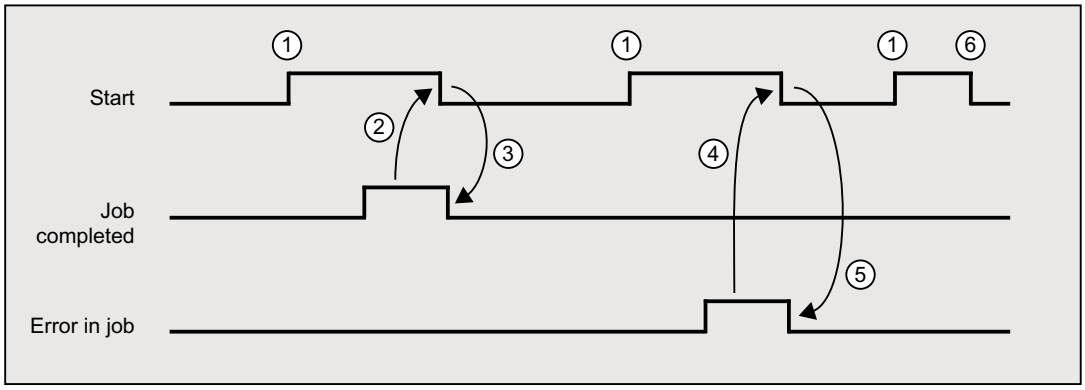
2) With the target location number = -1, a search is made in the complete magazine for an empty location for the tool according to the search strategy that has been selected. If a target location is specified, then a check is made as to whether the location with the specified target location number is free and suitable for the particular tool.

3) For a target magazine number = -1, a search is made in a buffer for the tool corresponding to the assignment obtained from $TC_MDP2.

Application examples

- When using buffers to return the tool (for example Toolboy and/or shifter), an explicit empty location search in the magazine may be needed during the asynchronous return transport. In this case, the PLC does not have to note the original location, the PI service TMMVTL searches for a suitable location.
- A tool is to be moved from a background magazine to the front magazine.

8.2.7 PI services: Cycle diagram



① User sets the signal "Start", job execution starts.
② After the PLC firmware signals "Job completed", the user resets the signal "Start".
③ By resetting the signal "Start", the PLC firmware resets the signal "Job completed".
④ After the PLC firmware signals "Error in job", the user resets the signal "Start".
⑤ By resetting the signal "Start", the PLC firmware resets the signal "Error in job".
⑥ If the user accidentally resets the signal "Start" before one of the signals "Job completed" or "Error in job" is received, then the result signals for this job are not updated. However, the job is executed.

8.3 PLC user alarms

8.3.1 User interface

Note

Although the designation user "*alarms*" is used in the following, it defines only whether a **message** or an **alarm** is involved when entering the associated **cancel criterion** (see "Configuring user alarms (Page 74)").

The user interface in DB1600 offers the option of displaying error and operational messages on the HMI.

This includes the following deliverables:

- Activation of the user alarms 700000 to 700247 and the extended user alarms 701000 to 701999.

  Note

  The use of the extended PLC user alarms 701000 to 701999 is subject to the following preconditions:

  - Compatibility mode must be deactivated.
  - The data block DB9913 must be contained in the PLC project (i.e. DB9913 was selected in the PLC Programming Tool under "Libraries" > "Special data blocks" and transferred with Copy & Paste / double-click to the PLC project).

- The user alarms 700000 to 700247 and 701000 to 701247 can be given an additional numeric parameter.
- Deactivation and acknowledgment of the user alarms.
- Evaluation of the system responses initiated by the user alarms.

The firmware evaluates the signals that have been entered and sends these as coming and going alarms and messages to the HMI where they are displayed. The HMI manages the error texts.

8.3.2 Activation interface of the user alarms

Each user alarm is activated using its assigned activation bit. These bits are set in the **activation interface**.

A new user alarm is activated with a 0/1 edge of the particular bit.

Activation interface for alarms 700000 to 700247

DB1600	**Alarm activation [r/w] (PLC → HMI)**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
	Activation of alarm no.							
DBB0	700007	700006	700005	700004	700003	700002	700001	700000
	Activation of alarm no.							
DBB1	700015	700014	700013	700012	700011	700010	700009	700008
	Activation of alarm no.							
DBB2	700023	700022	700021	700020	700019	700018	700017	700016
	Activation of alarm no.							
DBB3	700031	700030	700029	700028	700027	700026	700025	700024
	Activation of alarm no.							
DBB4	700039	700038	700037	700036	700035	700034	700033	700032
	Activation of alarm no.							
DBB5	700047	700046	700045	700044	700043	700042	700041	700040
...	....							

DB1600	Alarm activation [r/w] (PLC → HMI)							
	Activation of alarm no.							
DBB30	700247	700246	700245	700244	700243	700242	700241	700240

Activation interface for alarms 701000 to 701999

DB1600	Alarm activation [r/w] (PLC → HMI)							
Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
	Activation of alarm no.							
DBB4000	701007	701006	701005	701004	701003	701002	701001	701000
	Activation of alarm no.							
DBB4001	701015	701014	701013	701012	701011	701010	701009	701008
	Activation of alarm no.							
DBB4002	701023	701022	701021	701020	701019	701018	701017	701016
	Activation of alarm no.							
DBB4003	701031	701030	701029	701028	701027	701026	701025	701024
	Activation of alarm no.							
DBB4004	701039	701038	701037	701036	701035	701034	701033	701032
	Activation of alarm no.							
DBB4005	701047	701046	701045	701044	701043	701042	701041	701040
...	....							
	Activation of alarm no.							
DBB4124	701999	701998	701997	701996	701005	701994	701993	701992

8.3.3 Variables interface of the user alarms

The user alarms 700000 to 700247 and 701000 to 701247 can be given a variable as parameter. A double word is reserved for each in the **variable interface**. As a consequence, valid offsets must be divisible by 4.

Variable interface for alarms 700000 to 700247

DB1600	Variable for alarm [r32/w32] (PLC → HMI)							
Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
DBD1000	Variable for alarm 700000							
DBD1004	Variable for alarm 700001							
DBD1008	Variable for alarm 700002							
	...							
DBD1980	Variable for alarm 700245							
DBD1984	Variable for alarm 700246							
DBD1988	Variable for alarm 700247							

Variable interface for alarms 701000 to 701247

DB1600	Variable for alarm [r32/w32] (PLC → HMI)							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBD5000	Variable for alarm 701000							
DBD5004	Variable for alarm 701001							
DBD5008	Variable for alarm 701002							
	...							
DBD5980	Variable for alarm 701245							
DBD5984	Variable for alarm 701246							
DBD5988	Variable for alarm 701247							

8.3.4 Configuring user alarms

The following attributes can be specified for each alarm:

- Alarm response: How the control system responds when an error occurs.
- Cancel criterion: What must be done to cancel the alarm again or acknowledge it. The cancel criterion simultaneously defines the alarm type and priority.
- Channel assignment The channel to which the alarm is assigned.

User alarms 700000 to 700247

User alarms 700000 to 700247 are configured via machine data.

Alarm response and cancel criterion

The specification of the alarm reactions and the cancel criterion are coded as bits in the machine data:

MD14516 $MN_USER_DATA_PLC_ALARM [x] = <Alarm response and cancel criterion>

with x = user alarm number - 700000; value range: 0 ≤ x ≤ 247

<Alarm response and cancel criterion>	
Bit	**Meaning**
Alarm responses	
0	NC Start disable
1	Read-in disable
2	Feed disable for all axes
3	Emergency stop
4	PLC STOP
5	Alarm log
Cancel criteria	
6	Interrupt with DB1600 DBX3000.0

<Alarm response and cancel criterion>	
Bit	**Meaning**
7	Power On
Bit x = 1: Activating the functionality Bit x = 0: Deselecting the functionality	

Channel assignment

The channel is assigned as bit coding in the machine data:

MD14518 $MN_USER_DATA_PLC_ALARM_ASSIGN [x] = <channel assignment>

with x = user alarm number - 700000; value range: 0 ≤ x ≤ 247

<Channel assignment>	
Bit	**Meaning**
0	Scope NC-channel 1
1	Scope NC-channel 2
2	Scope NC-channel 3
3	Scope NC-channel 4
Bit x = 1: Channel selected Bit x = 0: Channel deselected	

User alarms 701000 to 701999

User alarms 701000 to 701999 are configured in data block DB9913 (ALARM_INI). Each alarm requires two bytes of configuration data. One byte for selecting the alarm reactions and cancel criteria, and one byte for the channel assignment. These two bytes are grouped as one word.

DB9913	**Configuring user alarms 701000 to 701999 [r]**
DBW0	Alarm 701000
DBW2	Alarm 701001
DBW4	Alarm 701002
	...
DBW1998	Alarm 701999

Bit	**Meaning**
Alarm response	
0	NC Start disable
1	Read-in disable
2	Feed disable for all axes
3	Emergency stop
4	PLC STOP
5	Alarm log
Cancel criterion	
6	Interrupt with DB1600 DBX3000.0
7	Power On

Bit	Meaning
Channel assignment	
8	PLC user alarm for NC-channel 1
9	PLC user alarm for NC-channel 2
10	PLC user alarm for NC-channel 3
11	PLC user alarm for NC-channel 4
12	Reserved
13	Reserved
14	Reserved
15	Reserved

Cancel criterion and priority

The cancel criterion and therefore implicitly also the type and priority of a user alarm is set using bits 6 and 7:

Bit 7	Bit 6	Cancel criterion:	Type	Priority
0	0	Resetting of the activation bit	Message	Low
0	1	Acknowledgment in DB1600.DBX3000.0 (see "Acknowledgement interface of the user alarms (Page 77)")	Alarm	Medium
1	0	Power On	Alarm	High
1	1	Reserved (internally evaluated as: Bit 7 = 1, bit 6 = 0)	-	-

Display message

If an alarm response is not activated (machine data bits 0 to 4 = 0) for one of the user alarms listed above, then this defines that it involves what is known as a "Display message" without having any effect on the system. This especially indicates that also the cancel criterion (machine data bits 6 and 7) of the corresponding machine data is not evaluated.

8.3.5 Export active alarm responses and cancel criteria

The present **active alarm responses** (i.e. the actual responses), the**active cancel criteria** and the **active channel assignment** can be exported globally from the interface.

DB1600	**Active alarm response [r]**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB2000	Power On	Interrupt with DB1600 DBX3000.0		PLC STOP	Emergency stop	Channel 1		
						Feed disable for all axes	Read-in disable	NC start disable
DBB2001						Channel 2		
						Feed disable for all axes	Read-in disable	NC start disable

DB1600	Active alarm response [r]							
DBB2002						Channel 3		
						Feed disable for all axes	Read-in disable	NC start disable
DBB2003						Channel 4		
						Feed disable for all axes	Read-in disable	NC start disable

One bit is set if for at least one active alarm the corresponding response or the corresponding cancel criterion is configured. It is canceled if this response/cancel criterion is no longer configured for any of the pending alarms.

8.3.6 Acknowledgement interface of the user alarms

Requirement to acknowledge a user alarm is that the corresponding activation bit is reset.

- Messages with cancel criterion {0,0} then disappear automatically from the display.
- Alarms with cancel criterion {0,1} are canceled by the acknowledgment bit *Ack*.
- Alarms with cancel criterion {1,0} are not influenced when the acknowledgment bit is set and can only be canceled by a Power On.

DB1600	Alarm acknowledgment [r/w]							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB3000								Ack
DBB3001								
DBB3002								
DBB3003								

8.3.7 Interface to HMI.

The PLC can transfer eight messages or alarms for display on the HMI, which are displayed in the sequence that they occur.

When additional messages/alarms occur, the first seven are kept in the HMI, and the latest message or the latest alarm is displaced from one that has just occurred according to the following rules:

- System message/alarm displaces user message/alarm.
- Messages/alarms with a higher priority displace those of a lower priority.

The first seven messages/alarms are kept in the display because it is very probable that these define the cause of the problem and the following are just of a secondary nature. However, if one or several messages/alarms are acknowledged and therefore cleared, then a corresponding number of alarms/messages that have been received move up in the HMI.

8.4 PLC axis control

8.4.1 General information

The PLC can control axes/spindles via data blocks of the user interface; the axis/spindle is specified by its DB number:

- **DB380x** PLC → NC interface (to axis/spindle)
- **DB390x** NC → PLC interface (from axis/spindle)

with axis index x: 0 ≤ x ≤ max. axis index; axis index = axis number - 1

The following functions are supported:

- Positioning axes
- Position spindle
- Rotate spindle
- Oscillate spindle
- Indexing axes

Further information

- Function Manual Axes and Spindles; Positioning axes, indexing axes, spindles

Requirement

The axis to be controlled must be assigned to the PLC (PLC axis). An axis can be interchanged between NC and PLC using the user interface "*Axis interchange*" (DB3800.DBB8/DB3900.DBB8).

Function start

Each function is activated by the positive edge of the corresponding "Start" signal. This signal must remain a logical "1" until the function has been positively or negatively acknowledged (e.g. using *Position reached* = "1" or *Error* = "1"). The signal "Positioning axis active" = "1" indicates that the function is active and that the output signals are valid.

Abort

It is **not** possible to **interrupt** the function by resetting the start signal, but only via other interface signals (using the axis-specific signal *Delete distance to go/spindle reset*, DB380x DBX2.2).

The axis interface returns axis status signals that may need to be evaluated (e.g. *exact stop*, *travel command*, → DB390x).

If the axis/spindle is being traversed via the NC program when the PLC axis control is called (travel command present), then the function is only started after this traversing motion has ended. No error code is output in this situation.

Axis disable

With the **axis disable** set, an axis controlled via PLC axis control will not move. Only a simulated actual value is generated. (Behavior as with NC programming).

8.4.2 User interface: Preparing the NC axis as PLC axis

Request signals to axis/spindle (excerpt)

Firstly, the axis/spindle must be requested from the PLC:

DB380x	Signals to the axis/spindle (PLC → NC) [r/w]							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB8	Request PLC axis/ spindle			Activation signal when this byte is changed			Assign NC axis/spindle channel	
							B	A

A change of a request signal (DB380x.DBX8.7 or 8.0) must be notified to the NC via a 0→1 edge of the activation signal (DB380x.DBX8.4). After a PLC cycle, the activation signal must be reset again.

Status signals from an axis/spindle (excerpt)

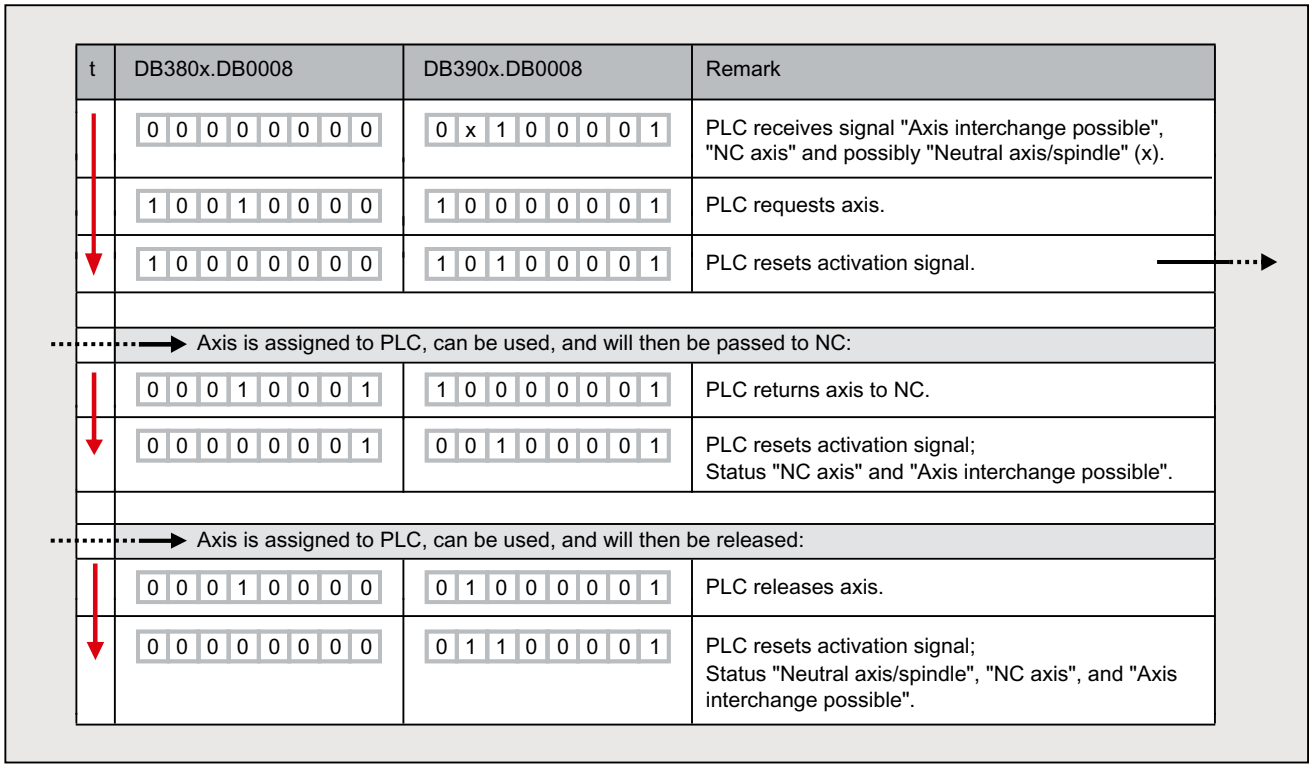
DB390x	Signals from the axis/spindle (NC → PLC) [r]							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB8	PLC axis/ spindle	Neutral axis/ spindle	Axis interchange possible	New type requested from PLC			Current assignment of the NC axis/spindle in channel	
							B	A

Note

Simulation

To activate the interface signals, the machine data MD30350 $MA_SIMU_AX_VDI_OUTPUT must be set for each required axis during the simulation.

Request and relinquish PLC axis



t	DB380x.DB0008	DB390x.DB0008	Remark
↓	0 0 0 0 0 0 0 0	0 x 1 0 0 0 0 1	PLC receives signal "Axis interchange possible", "NC axis" and possibly "Neutral axis/spindle" (x).
↓	1 0 0 1 0 0 0 0	1 0 0 0 0 0 0 1	PLC requests axis.
↓	1 0 0 0 0 0 0 0	1 0 1 0 0 0 0 1	PLC resets activation signal. →
→	Axis is assigned to PLC, can be used, and will then be passed to NC:		
↓	0 0 0 1 0 0 0 1	1 0 0 0 0 0 0 1	PLC returns axis to NC.
↓	0 0 0 0 0 0 0 1	0 0 1 0 0 0 0 1	PLC resets activation signal; Status "NC axis" and "Axis interchange possible".
→	Axis is assigned to PLC, can be used, and will then be released:		
↓	0 0 0 1 0 0 0 0	0 1 0 0 0 0 0 1	PLC releases axis.
↓	0 0 0 0 0 0 0 0	0 1 1 0 0 0 0 1	PLC resets activation signal; Status "Neutral axis/spindle", "NC axis", and "Axis interchange possible".

8.4.3 User interface: Functionality

The two tables provide an overview of the available interface signals. The precise description of the signals and the explanation of what signals are relevant for the individual functions are explained in the following.

Signals to PLC axis

DB380x	Signals to the PLC axis (PLC → NC) [r/w]							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB3000	Start positioning axis	Start spindle positioning	Start spindle rotation	Start spindle oscillation	-	-	-	-
DBB3001	-	-	Stop spindle rotation	Stop spindle oscillation	-	-	-	-
DBB3002	Automatic gear selection	Constant cutting rate	Direction of rotation as for M4	-	Handwheel override	Traversing dimension, inches (not metric)	Distance condition, shortest distance (DC)	Distance condition, incremental (IC)

DB380x	Signals to the PLC axis (PLC → NC) [r/w]							
DBB3003	Indexing position	-	-	-	-	-	Distance condition, abs. pos. direction (ACP)	Distance condition, abs. neg. direction (ACN)
DBD3004	Position (REAL, with indexing axis: DINT)							
DBD3008	Feedrate velocity (REAL), if < 0, the value is taken from machine data POS_AX_VELO							

The bits of the distance conditions and the direction of rotation definition define the particular positioning or traversing mode, only one of the bits must be set:

Meaning	Distance condition to be set
Positioning absolute	No mode bit set
Positioning incremental	DBB3002.0 = 1
Positioning shortest distance	DBB3002.1 = 1
Positioning absolute, positive approach direction	DBB3003.1 = 1
Positioning absolute, negative approach direction	DBB3003.0 = 1
Direction of rotation as for M4	DBB3002.5 = 1

The remaining bits are used to specify and start the particular function, these function bits as well as position and velocity are explained in more detail for the individual functions.

Signals from PLC axis

DB390x	Signals from the PLC axis (NC → PLC) [r]							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB3000	Positioning axes active	Position reached		-	-	-	Error while traversing	Axis cannot be started
DBB3001	-	-	-	-	-	-	-	-
DBB3002	-	-	-	-	-	-		-
DBB3003	Error number							

The following requirements must be satisfied in order to use the functions listed below:

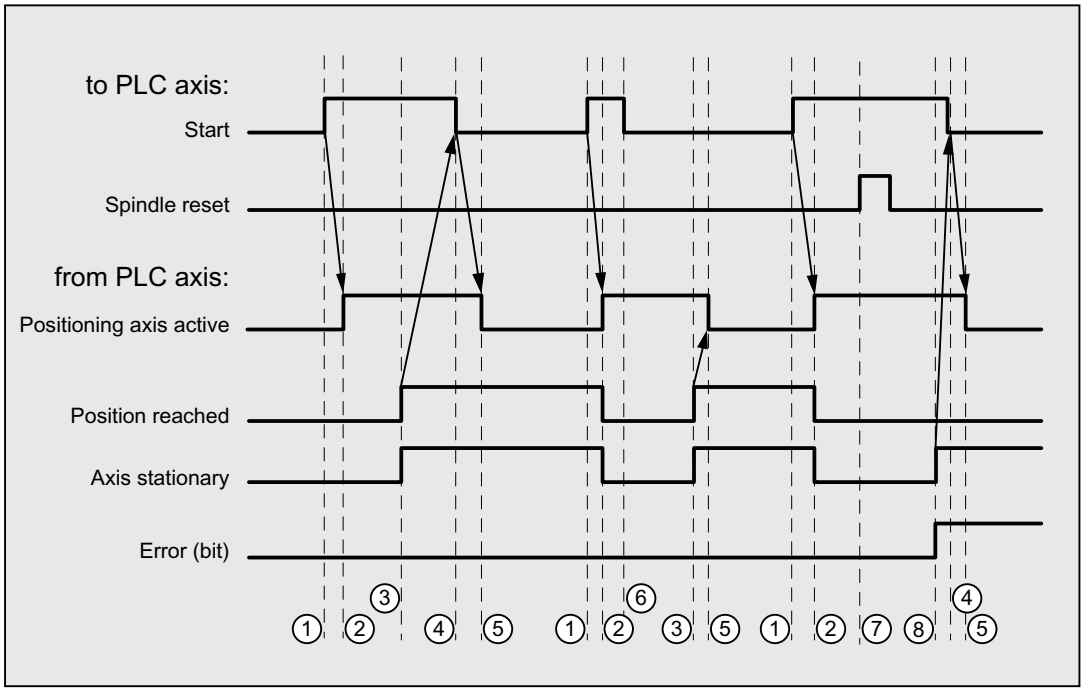
- The axis or spindle is correctly assigned to the PLC.
- Controller and pulse enable are set.
- After setting all of the control signals, only one of the start signals is set in DB380x.DBB3000.

8.4.4 Spindle positioning

DB380x	PLC → NC control signals	Remark
DBX3002.0	Incremental traversing	Only one of the four signals may be set concurrently. All signals 0: Absolute positioning
DBX3002.1	Traverse along the shortest path	
DBX3003.0	Absolute, negative direction	
DBX3003.1	Absolute, positive direction	

DB380x	PLC → NC control signals	Remark
DBD3004	Position setpoint / distance setpoint	Distance setpoint if DBX3002.0 == 1
DBD3008	Feedrate	0: Traverse with the value from MD35300 $MA_SPIND_POSCTRL_VELO
DBX3000.6	Start	**Note** Reset of the signal does not result in a stop!
DBX2.2	Delete distance-to-go, spindle reset	Interrupt signal, exits the function

DB390x	NC → PLC status signals	Remark
DBX3000.7	Positioning axis active	Also 1 when override = 0 or position setpoint reached when start = 1
DBX3000.6	Position reached	1: Position setpoint reached with "Exact stop fine"
DBX3000.0	Spindle cannot be started	
DBX3000.1	Error while traversing	1: Error during traversing, evaluate error number in DBB3003!
DBB3003	Error number	
DBX1.4	Axis/spindle stationary	1: if $n < n_{min}$



① Function activated by user with a positive edge of *Start*.

② *Positioning axis active* message shows that the function is active and that the output signals are valid, *Position reached* and *Axis stationary* may be withdrawn. For path specification = 0, the signals are not canceled.

③ When the position is reached this is signaled (*Position reached*), *Spindle stationary* is set.

④ The user then withdraws *Start*.

⑤ The *Positioning axis active* signal is then reset.

⑥ The user immediately resets the *Start* signal with receipt of the *Positioning axis active* signal.

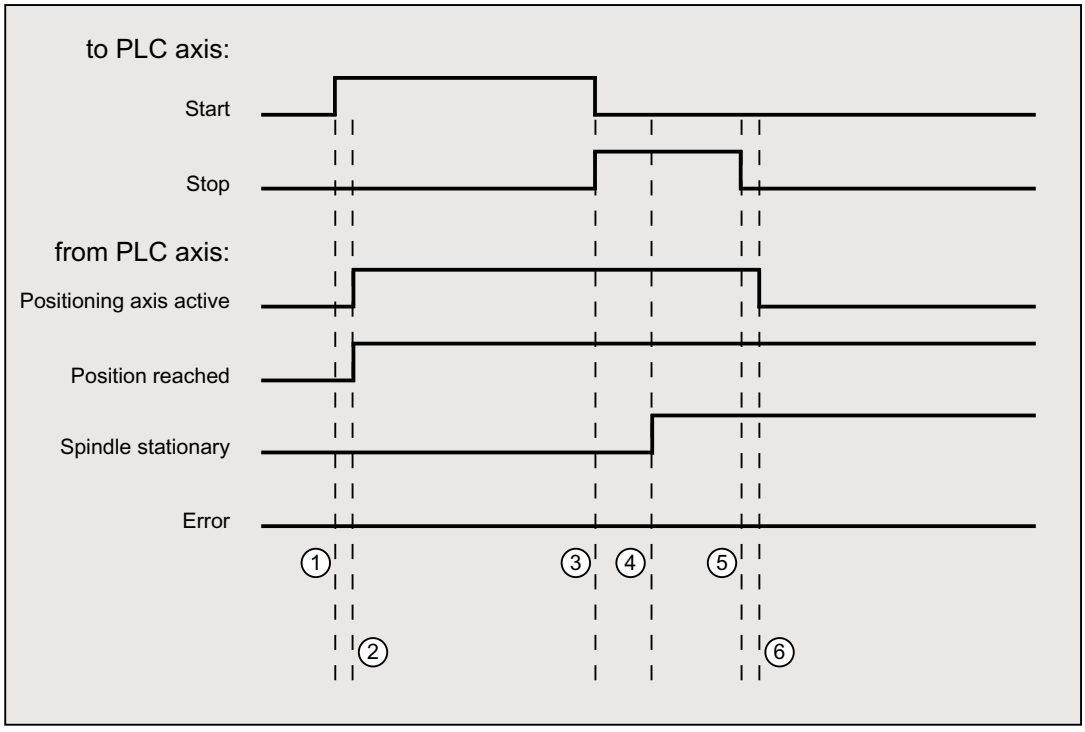
⑦ Positioning is aborted by setting *Spindle reset*. This signal must be present for at least one PLC cycle.

⑧ The spindle comes to a standstill (*Spindle stationary*), the *Error* signal is set. (In this case, error number 115 is output.)

8.4.5 Rotate spindle

DB380x	PLC → NC control signals	Remark
DBX3002.0	Incremental traversing	-
DBX3002.1	Traverse along the shortest path	-
DBX3002.5	Direction of rotation as for M4	1: Direction of rotation specified by M4 0: Direction of rotation specified by M3
DBX3003.0	Absolute, negative direction	-
DBX3003.1	Absolute, positive direction	-
DBD3008	Feedrate	Spindle speed
DBX3000.5	Start spindle rotation	-
DBX3001.5	Stop spindle rotation	-

DB390x	NC → PLC status signals	Remark
DBX3000.7	Positioning axis active	1: For start or stop == 1
DBX3000.6	Position reached	1: Function was started without an error
DBX3000.1	Error	1: Error when traversing, evaluate error number in DBB3003!
DBB3003	Error number	-
DBX1.4	Axis/spindle stationary	-



① Function activated by user with a positive edge of *Start*.

② Messages *Positioning axis active* and *Position reached* are signaled back, *Position reached* is in this case irrelevant.

③ The user stops spindle rotation by resetting *Start* and setting *Stop*.

④ The spindle stops and the *Spindle stationary* signal is set.

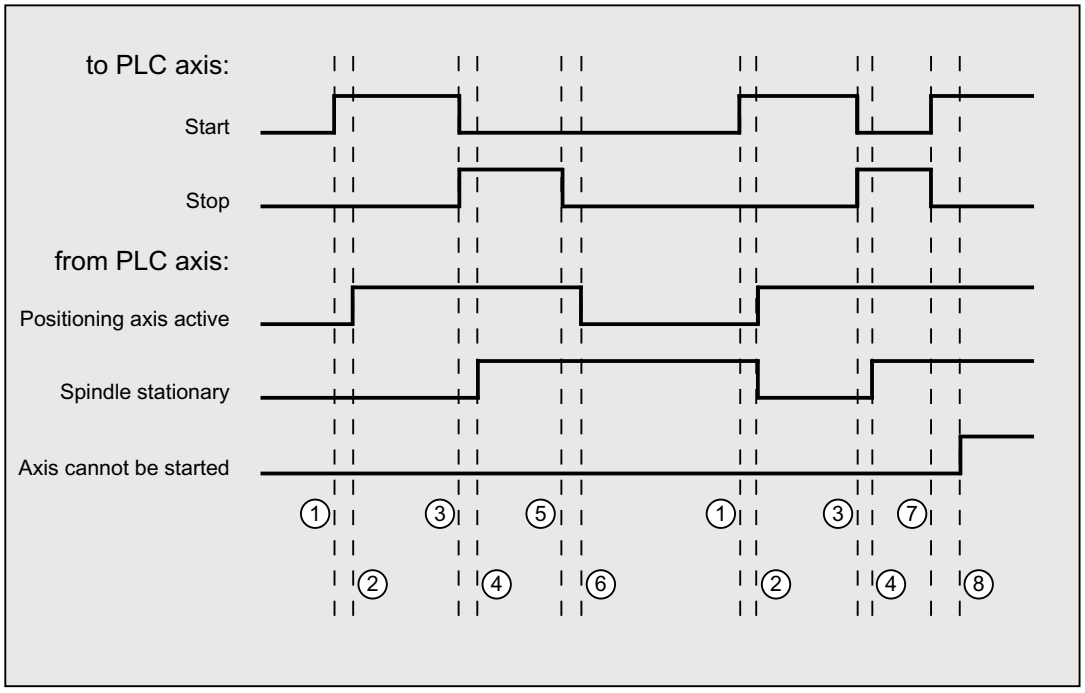
⑤ The user then resets *Stop*.

⑥ Reset of *Stop* causes *Positioning axis active* to be reset.

8.4.6 Oscillate spindle

DB380x	PLC → NC control signals	Remark
DBX3002.0	Incremental	It is not permissible that any of the bits are set.
DBX3002.1	Shortest path	
DBX3002.5	Direction of rotation as for M4	
DBX3003.0	Absolute, negative direction	
DBX3003.1	Absolute, positive direction	
DBD3004	Setpoint gear stage	**MD35010 $MA_GEAR_STEP_CHANGE_ENABLE = 0** 0 - 5: Oscillation **MD35010 $MA_GEAR_STEP_CHANGE_ENABLE = 1** 0: Oscillation 1: Oscillation with gear stage change M41 2: Oscillation with gear stage change M42 3: Oscillation with gear stage change M43 4: Oscillation with gear stage change M44 5: Oscillation with gear stage change M45
DBD3008	Feedrate	When oscillating, no significance! The oscillation speed is taken from machine data MD35400, $MA_SPIND_OSCILL_DES_VELO.
DBX3000.4	Start spindle oscillation	It is not permissible that the start directly follows a stop. Stop must first be reset (both 0).
DBX3001.4	Stop spindle oscillation	

DB390x	NC → PLC status signals	Remark
DBX3000.7	Positioning axis active	1: For start or stop == 1
DBX3000.6	Position reached	1: after start
DBX3000.1	Error	1: Error when traversing, evaluate error number in DBB3003!
DBX3000.0	Axis cannot be started	1: Error when starting, evaluate error number in DBB3003!
DBB3003	Error number	
DBX1.4	Axis/spindle stationary	



① Function activated by user with a positive edge of *Start*.
Note: This is possible only when the *Positioning axis active* signal is reset!

② Messages *Positioning axis active* and *Position reached* are signaled back, *Position reached* is in this case irrelevant and is therefore not shown.

③ The user stops spindle oscillation by resetting *Start* and setting *Stop*.

④ The spindle stops and the *Spindle stationary* signal is set.

⑤ The user then resets *Stop*.

⑥ Reset of *Stop* causes *Positioning axis active* to be reset.

⑦ *Stop* is reset in the user program and *Start* is again set, incorrectly, in the same PLC cycle. This means that *Positioning axis active* is not reset, but...

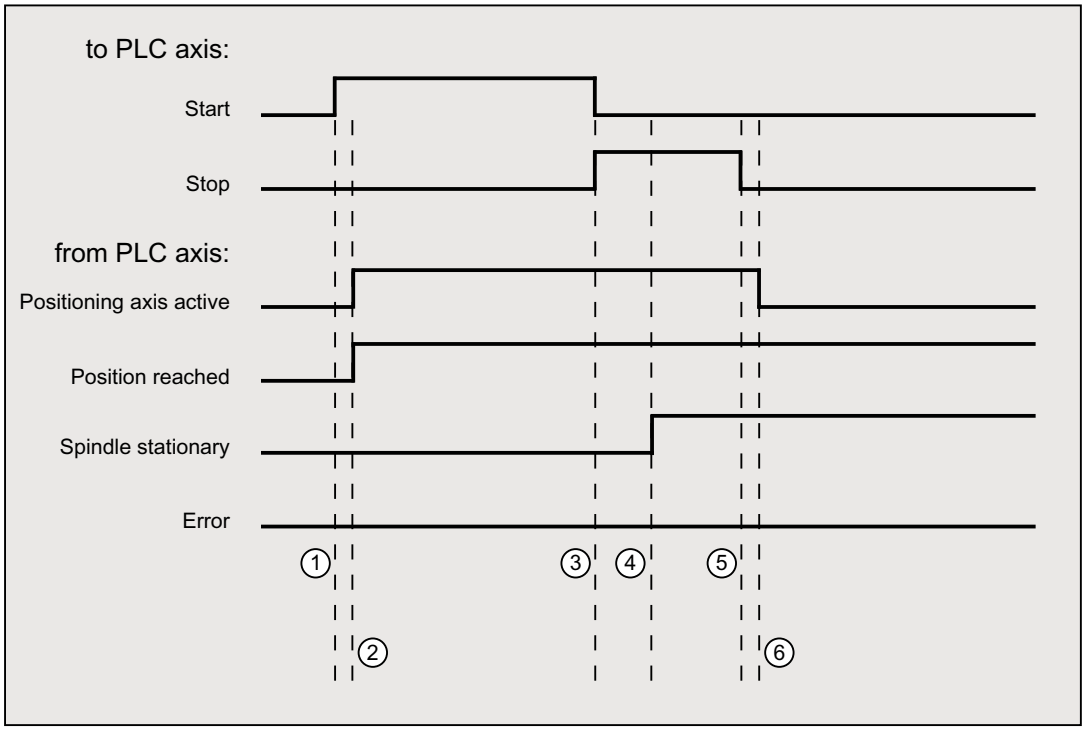
⑧ ...the *Axis cannot be started* signal is set (error number 106).

8.4.7 Indexing axis

DB380x	PLC → NC control signals	Remark
DBX3002.0	Incremental traversing	Only one of the signals may be set concurrently. All signals 0: Absolute positioning
DBX3002.1	Traverse along the shortest path	
DBX3002.5	Direction of rotation as for M4	
DBX3003.0	Absolute, negative direction	
DBX3003.1	Absolute, positive direction	
DBX3003.7	Indexing position	Indexing axis ON
DBD3004	Position setpoint / distance setpoint	Distance setpoint if DBX3002.0 == 1
DBD3008	Feedrate	0: Traverse with the value from MD32060 $MA_POS_AX_VELO

DB380x	PLC → NC control signals	Remark
DBX3000.7	Start positioning axis	**Note** Reset of the signal does not result in a stop!
DBX2.2	Delete distance-to-go, spindle reset	Interrupt signal, exits the function

DB390x	NC → PLC status signals	Remark
DBX3000.7	Positioning axis active	Also 1, if override = 0 or position setpoint reached.
DBX3000.6	Position reached	1: Position setpoint reached with "Exact stop fine".
DBX3000.1	Error	1: Error when traversing, evaluate error number in DBB3003!
DBB3003	Error number	-
DBX1.4	Axis/spindle stationary	-



① Function activated by user with a positive edge of *Start*.
Note: This is possible only when the *Positioning axis active* signal is reset!

② Messages *Positioning axis active* and *Position reached* are signaled back, *Position reached* is in this case irrelevant.

③ The user stops spindle oscillation by resetting *Start* and setting *Stop*.

④ The spindle stops and the *Spindle stationary* signal is set.

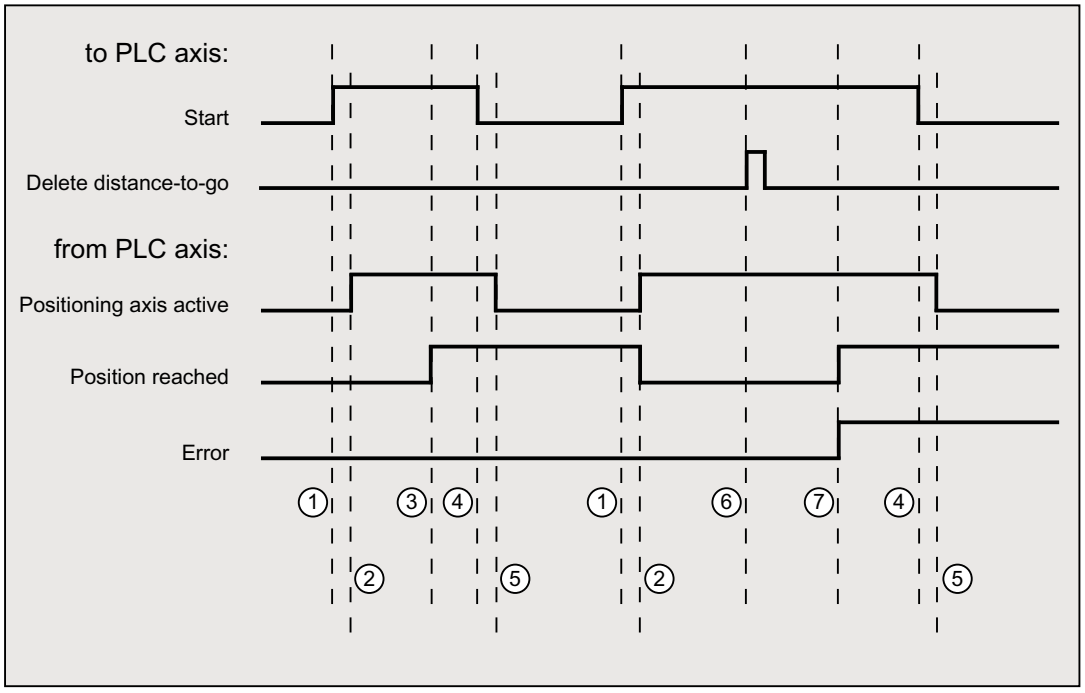
⑤ The user then resets *Stop*.

⑥ Reset of *Stop* causes *Positioning axis active* to be reset.

8.4.8 Positioning axis metric

DB380x	PLC → NC control signals	Remark
DBX3002.0	Incremental traversing	Only one of the signals may be set concurrently. All signals 0: Absolute positioning
DBX3002.1	Traverse along the shortest path	
DBX3002.5	Direction of rotation as for M4	
DBX3003.0	Absolute, negative direction	
DBX3003.1	Absolute, positive direction	
DBD3002.2	Traversing dimension inch	0: Traversing dimension, metric
DBX3002.3	Handwheel override	0: Override OFF
DBD3004	Position setpoint / distance setpoint	Distance setpoint if DBX3002.0 == 1
DBD3008	Feedrate	0: Traverse with the value from MD32060 $MA_POS_AX_VELO
DBX3000.7	Start positioning axis	**Note** Reset of the signal does not result in a stop!
DBX2.2	Delete distance-to-go, spindle reset	Interrupt signal, exits the function

DB390x	NC → PLC status signals	Remark
DBX3000.7	Positioning axis active	Also 1, if override = 0 or position setpoint reached.
DBX3000.6	Position reached	1: Axis has reached the position setpoint.
DBX3000.1	Error	1: Error when traversing, evaluate error number in DBB3003!
DBB3003	Error number	-

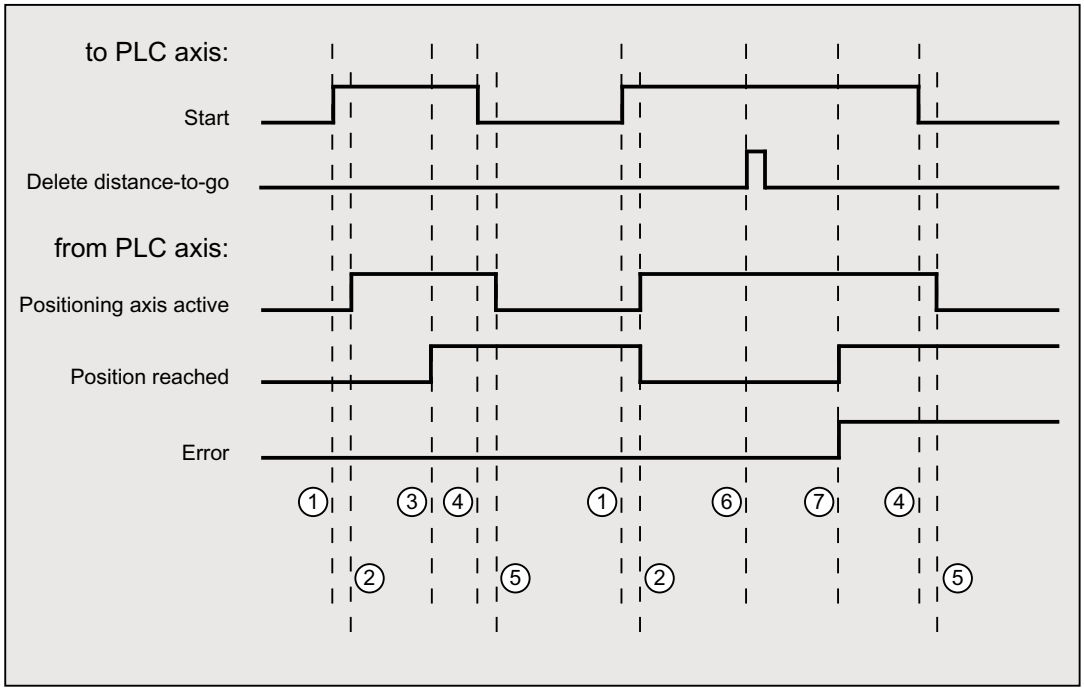


① First function activation using positive edge of *Start*.
② *Positioning axis active* = 1 shows that the function is active and that the output signals are valid, *Position reached* and *Axis stationary* are possibly withdrawn.
③ Positive acknowledgment *Position reached* = 1 and *Positioning axis active* = 1
④ Reset function activation after receipt of acknowledgment
⑤ Signal change via function
⑥ Positioning is aborted by delete distance-to-go, signal duration min. 1 PLC cycle.
⑦ The signals *Position reached* and *Error* are set, the *Error number* can be read (in this case, 30).

8.4.9 Positioning axis inch

DB380x	PLC → NC control signals	Remark
DBX3002.0	Incremental traversing	Only one of the signals may be set concurrently. All signals 0: Absolute positioning
DBX3002.1	Traverse along the shortest path	
DBX3002.5	Direction of rotation as for M4	
DBX3003.0	Absolute, negative direction	
DBX3003.1	Absolute, positive direction	
DBX3002.2	Traversing dimension inch	0: Traversing dimension, metric
DBX3002.3	Handwheel override	0: Override OFF
DBD3004	Position setpoint / distance setpoint	Distance setpoint if DBX3002.0 == 1
DBD3008	Feedrate	0: Traverse with the value from MD32060 $MA_POS_AX_VELO
DBX3000.7	Start positioning axis	**Note** Reset of the signal does not result in a stop!
DBX2.2	Delete distance-to-go, spindle reset	Interrupt signal, exits the function

DB390x	NC → PLC status signals	Remark
DBX3000.7	Positioning axis active	Also 1, if override = 0 or position setpoint reached.
DBX3000.6	Position reached	1: Axis has reached the position setpoint.
DBX3000.1	Error	1: Error when traversing, evaluate error number in DBB3003!
DBB3003	Error number	-



① First function activation using positive edge of *Start*.

② *Positioning axis active* = 1 shows that the function is active and that the output signals are valid, *Position reached* and *Axis stationary* are possibly withdrawn.

③ Positive acknowledgment *Position reached* = 1 and *Positioning axis active* = 1

④ Reset function activation after receipt of acknowledgment

⑤ Signal change via function

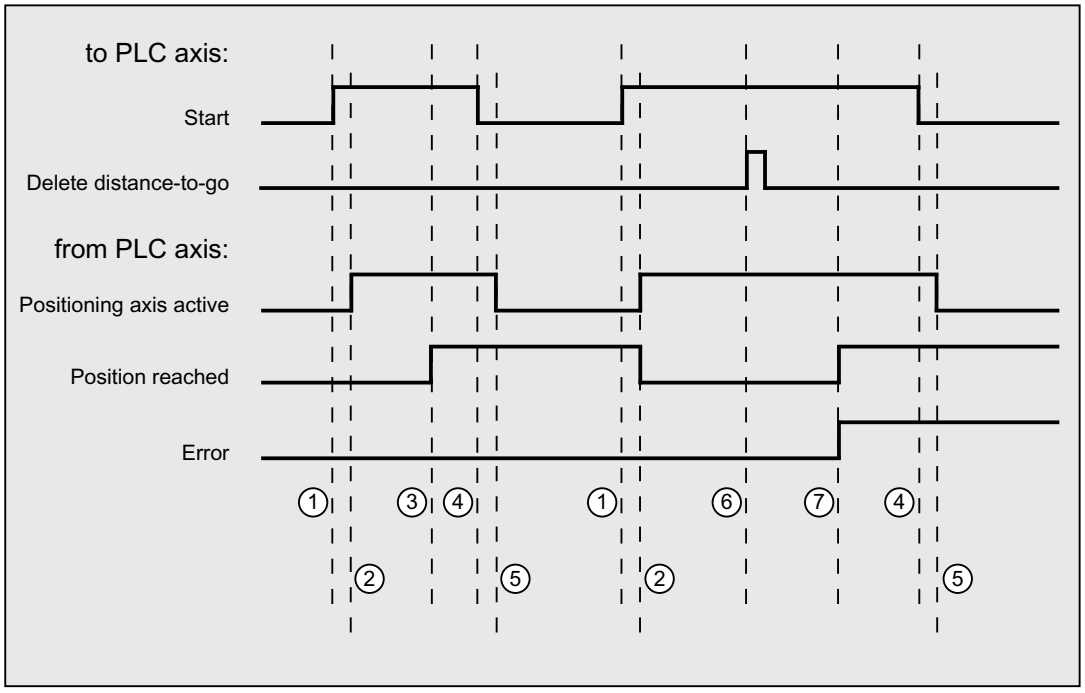
⑥ Positioning is aborted by delete distance-to-go, signal duration min. 1 PLC cycle.

⑦ The signals *Position reached* and *Error* are set, the *Error number* can be read (in this case, 30).

8.4.10 Positioning axis metric with handwheel override

DB380x	PLC → NC control signals	Remark
DBX3002.0	Incremental traversing	Only one of the signals may be set concurrently. All signals 0: Absolute positioning
DBX3002.1	Traverse along the shortest path	
DBX3002.5	Direction of rotation as for M4	
DBX3003.0	Absolute, negative direction	
DBX3003.1	Absolute, positive direction	
DBX3002.2	Traversing dimension inch	0: Traversing dimension, metric
DBX3002.3	Handwheel override	0: Override OFF
DBD3004	Position setpoint / distance setpoint	Distance setpoint if DBX3002.0 == 1
DBD3008	Feedrate	0: Traverse with the value from MD32060 $MA_POS_AX_VELO
DBX3000.7	Start positioning axis	**Note** Reset of the signal does not result in a stop!
DBX2.2	Delete distance-to-go, spindle reset	Interrupt signal, exits the function

DB390x	NC → PLC status signals	Remark
DBX3000.7	Positioning axis active	Also 1, if override = 0 or position setpoint reached.
DBX3000.6	Position reached	1: Axis has reached the position setpoint.
DBX3000.1	Error	1: Error when traversing, evaluate error number in DBB3003!
DBB3003	Error number	-

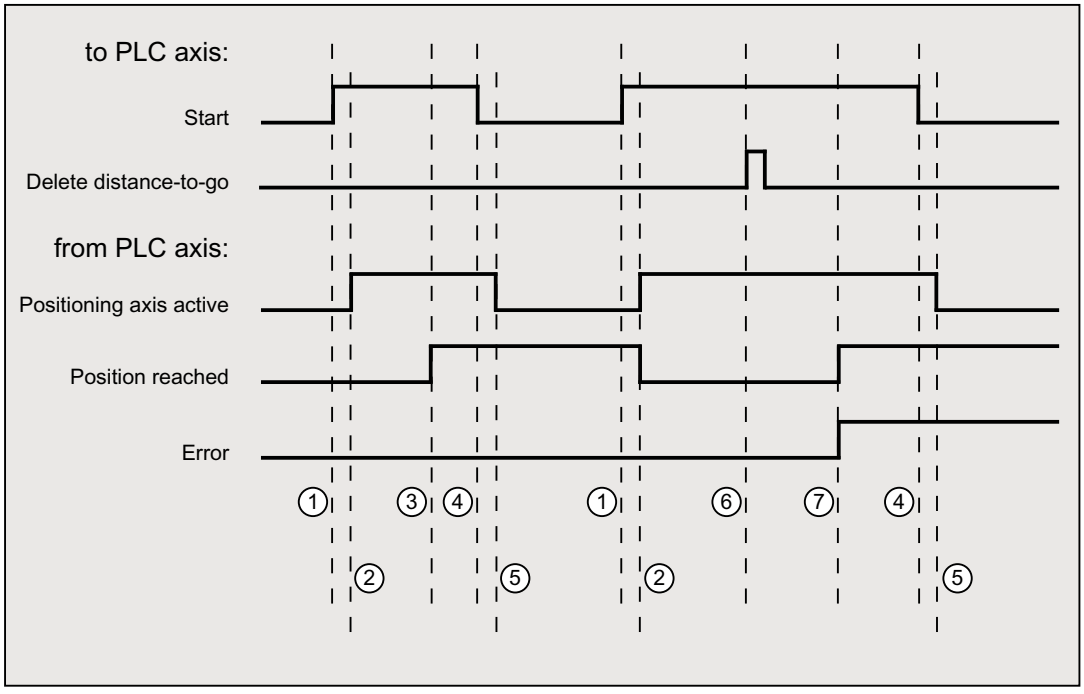


① First function activation using positive edge of *Start*.
② *Positioning axis active* = 1 shows that the function is active and that the output signals are valid, *Position reached* and *Axis stationary* are possibly withdrawn.
③ Positive acknowledgment *Position reached* = 1 and *Positioning axis active* = 1
④ Reset function activation after receipt of acknowledgment
⑤ Signal change via function
⑥ Positioning is aborted by delete distance-to-go, signal duration min. 1 PLC cycle.
⑦ The signals *Position reached* and *Error* are set, the *Error number* can be read (in this case, 30).

8.4.11 Positioning axis inch with handwheel override

DB380x	PLC → NC control signals	Remark
DBX3002.0	Incremental traversing	Only one of the signals may be set concurrently. All signals 0: Absolute positioning
DBX3002.1	Traverse along the shortest path	
DBX3002.5	Direction of rotation as for M4	
DBX3003.0	Absolute, negative direction	
DBX3003.1	Absolute, positive direction	
DBX3002.2	Traversing dimension inch	0: Traversing dimension, metric
DBX3002.3	Handwheel override	0: Override OFF
DBD3004	Position setpoint / distance setpoint	Distance setpoint if DBX3002.0 == 1
DBD3008	Feedrate	0: Traverse with the value from MD32060 $MA_POS_AX_VELO
DBX3000.7	Start positioning axis	**Note** Reset of the signal does not result in a stop!
DBX2.2	Delete distance-to-go, spindle reset	Interrupt signal, exits the function

DB390x	NC → PLC status signals	Remark
DBX3000.7	Positioning axis active	Also 1, if override = 0 or position setpoint reached.
DBX3000.6	Position reached	1: Axis has reached the position setpoint.
DBX3000.1	Error	1: Error when traversing, evaluate error number in DBB3003!
DBB3003	Error number	-



① First function activation using positive edge of *Start*.

② *Positioning axis active* = 1 shows that the function is active and that the output signals are valid, *Position reached* and *Axis stationary* are possibly withdrawn.

③ Positive acknowledgment *Position reached* = 1 and *Positioning axis active* = 1

④ Reset function activation after receipt of acknowledgment

⑤ Signal change via function

⑥ Positioning is aborted by delete distance-to-go, signal duration min. 1 PLC cycle.

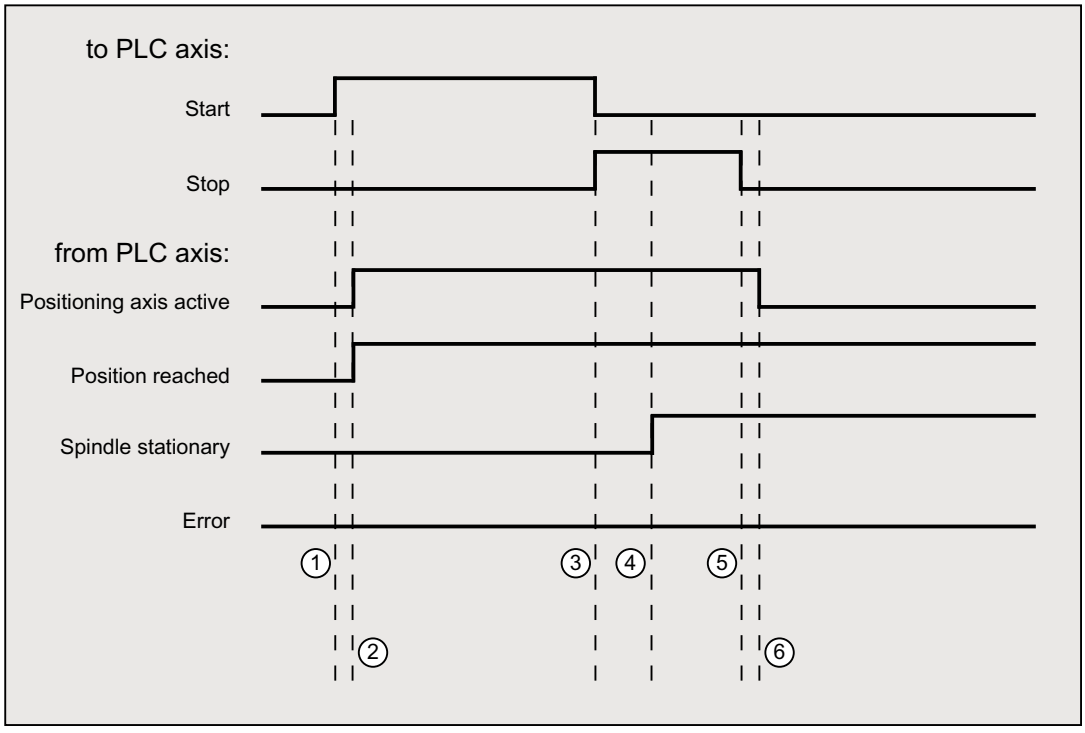
⑦ The signals *Position reached* and *Error* are set, the *Error number* can be read (in this case, 30).

8.4.12 Rotate spindle with automatic gear stage selection

DB380x	PLC → NC control signals	Remark
DBX3002.0	Incremental traversing	-
DBX3002.1	Traverse along the shortest path	-
DBX3002.5	Direction of rotation as for M4	1: Direction of rotation specified by M4 0: Direction of rotation specified by M3

DB380x	PLC → NC control signals	Remark
DBX3003.0	Absolute, negative direction	-
DBX3003.1	Absolute, positive direction	-
DBX3002.7	Automatic gear stage selection	1: Automatic gear stage selection ON
DBD3008	Feedrate	Spindle speed
DBX3000.5	Start spindle rotation	-
DBX3001.5	Stop spindle rotation	-

DB390x	NC → PLC status signals	Remark
DBX3000.7	Positioning axis active	1: For start or stop == 1
DBX3000.6	Position reached	1: Setpoint speed is output
DBX3000.1	Error	1: Error when traversing, evaluate error number in DBB3003!
DBB3003	Error number	-
DBX1.4	Axis/spindle stationary	-



① Function activated by user with a positive edge of *Start*.

② Messages *Positioning axis active* and *Position reached* are signaled back, *Position reached* is in this case irrelevant.

③ The user stops spindle rotation by resetting *Start* and setting *Stop*.

④ The spindle stops and the *Spindle stationary* signal is set.

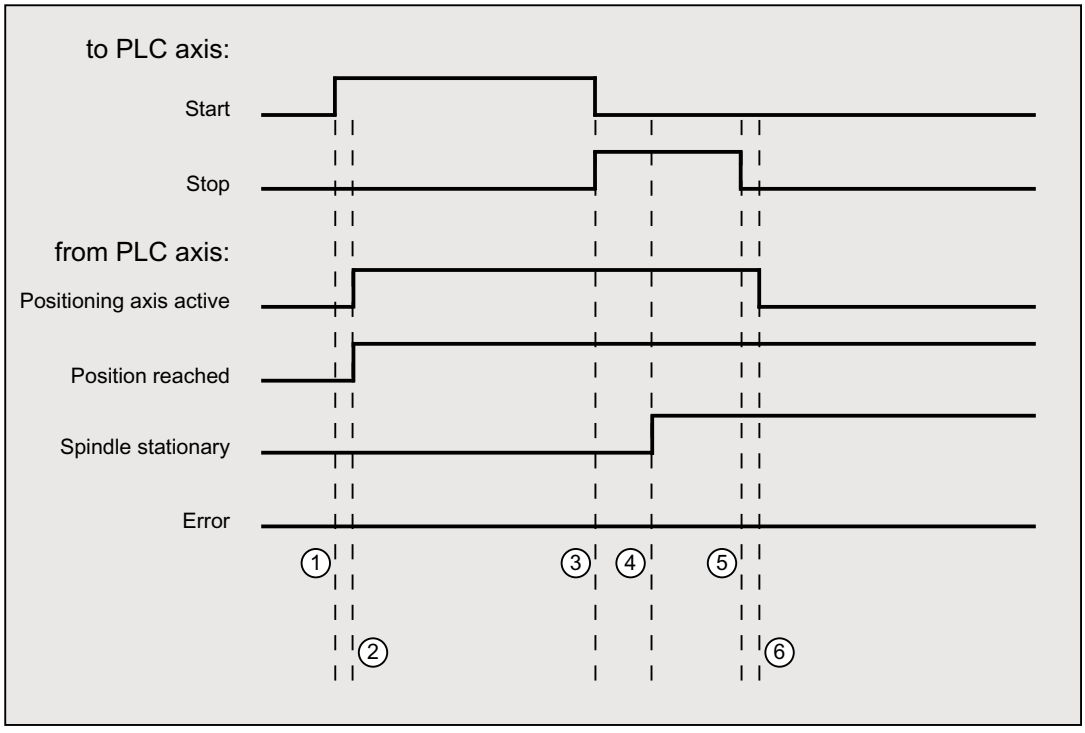
⑤ The user then resets *Stop*.

⑥ Reset of *Stop* causes *Positioning axis active* to be reset.

8.4.13 Rotate spindle with constant cutting rate [m/min]

DB380x	PLC → NC control signals	Remark
DBX3002.0	Incremental traversing	-
DBX3002.1	Traverse along the shortest path	-
DBX3002.5	Direction of rotation as for M4	1: Direction of rotation specified by M4 0: Direction of rotation specified by M3
DBX3003.0	Absolute, negative direction	-
DBX3003.1	Absolute, positive direction	-
DBX3002.2	Traversing dimension inch	**0**: Traversing dimension, metric
DBX3002.6	Const. Cutting rate	**1**: Constant cutting speed ON
DBD3008	Feedrate	Spindle speed
DBX3000.5	Start spindle rotation	-
DBX3001.5	Stop spindle rotation	-

DB390x	NC → PLC status signals	Remark
DBX3000.7	Positioning axis active	1: For start or stop == 1
DBX3000.6	Position reached	1: Setpoint speed is output
DBX3000.1	Error	1: Error when traversing, evaluate error number in DBB3003!
DBB3003	Error number	-
DBX1.4	Axis/spindle stationary	-



① Function activated by user with a positive edge of *Start*.

② Messages *Positioning axis active* and *Position reached* are signaled back, *Position reached* is in this case irrelevant.

③ The user stops spindle rotation by resetting *Start* and setting *Stop*.

④ The spindle stops and the *Spindle stationary* signal is set.

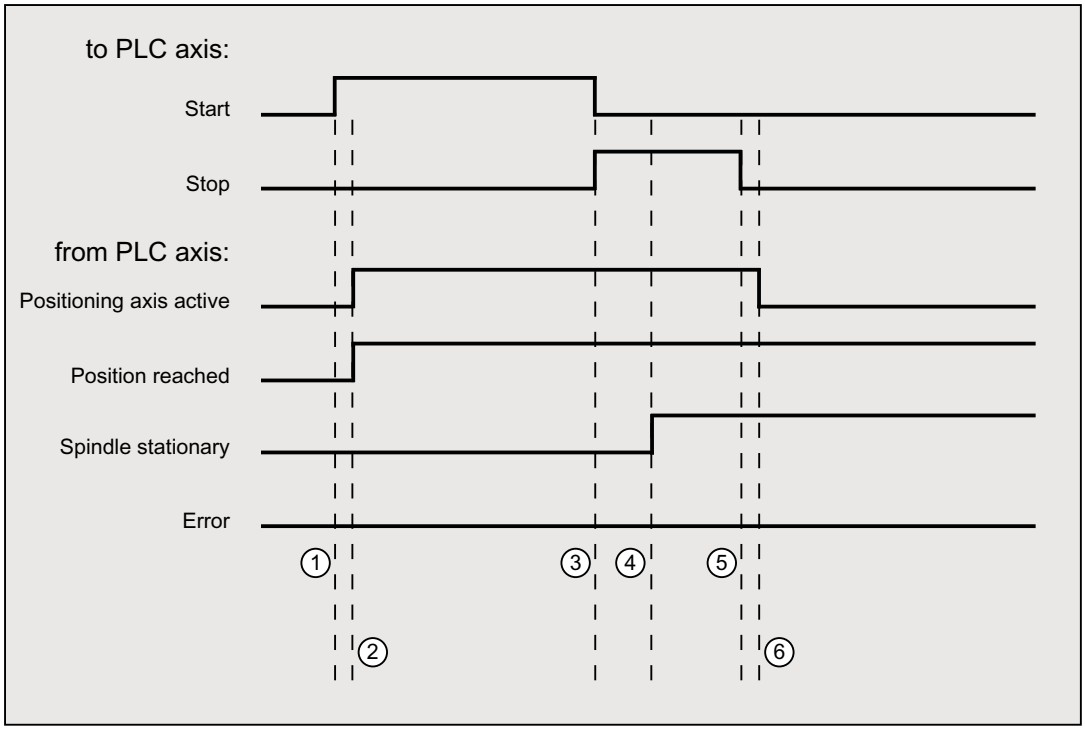
⑤ The user then resets *Stop*.

⑥ Reset of *Stop* causes *Positioning axis active* to be reset.

8.4.14 Rotate spindle with constant cutting rate [feet/min]

DB380x	PLC → NC control signals	Remark
DBX3002.0	Incremental traversing	-
DBX3002.1	Traverse along the shortest path	-
DBX3002.5	Direction of rotation as for M4	1: Direction of rotation specified by M4 0: Direction of rotation specified by M3
DBX3003.0	Absolute, negative direction	-
DBX3003.1	Absolute, positive direction	-
DBX3002.2	Traversing dimension inch	1: Traversing dimension inch
DBX3002.6	Const. Cutting rate	1: Constant cutting speed ON
DBD3008	Feedrate	Spindle speed
DBX3000.5	Start spindle rotation	-
DBX3001.5	Stop spindle rotation	-

DB390x	NC → PLC status signals	Remark
DBX3000.7	Positioning axis active	1: For start or stop == 1
DBX3000.6	Position reached	1: Setpoint speed is output
DBX3000.1	Error	1: Error when traversing, evaluate error number in DBB3003!
DBB3003	Error number	-
DBX1.4	Axis/spindle stationary	-



① Function activated by user with a positive edge of *Start*.

② Messages *Positioning axis active* and *Position reached* are signaled back, *Position reached* is in this case irrelevant.

③ The user stops spindle rotation by resetting *Start* and setting *Stop*.

④ The spindle stops and the *Spindle stationary* signal is set.

⑤ The user then resets *Stop*.

⑥ Reset of *Stop* causes *Positioning axis active* to be reset.

8.4.15 Error messages

If a function could not be executed, the following signals are set depending on the error:

- DB390x .DBX3000.0 == 1 (axis cannot be started)
- DB390x.DBX3000.1 == 1 (error during travel)

The exact error cause is indicated as:

- DB390x.DBB3003 (error number)

Error number		Meaning
Decimal	**Hex**	
1	01	Several functions of the axis/spindle were activated simultaneously
20	14	A function was started without the position being reached
30	1E	The axis/spindle was transferred to the NC while still in motion
40	28	The axis is programmed by the NC program, NC internal error
50	32	Permanently assigned PLC axis: Traverses (JOG) or references
60	3C	Permanently assigned PLC axis: Channel status does not permit a start
100	64	False position programmed for axis/spindle (alarm number[1)] 16830)
101	65	Programmed speed is too high
102	66	Incorrect value range for constant cutting rate (alarm number[1)] 14840)
104	68	Following spindle: Illegal programming (alarm number[1)] 22030)
105	69	No measuring system available (alarm number[1)] 16770)
106	6A	Positioning process of the axis still active (alarm number[1)] 22052)
107	6B	Reference mark not found (alarm number[1)] 22051)
108	6C	No transition from speed control to position control (alarm number[1)] 22050)
109	6D	Reference mark not found (alarm number[1)] 22051)
110	6E	Velocity/speed is negative
111	6F	Speed setpoint is zero
112	70	Invalid gear stage
115	73	Programmed position has not been reached
117	75	G96/G961 is not active in the NC
118	76	G96/G961 is still active in the NC
120	78	Axis is not an indexing axis (alarm number[1)] 20072)
121	79	Indexing position error (alarm number[1)] 17510)
125	7D	DC (shortest distance) not possible (alarm number[1)] 16800)
126	7E	Absolute value minus not possible (alarm number[1)] 16820)
127	7F	Absolute value plus not possible (alarm number[1)] 16810)
128	80	No transverse axis available for diameter programming (alarm number[1)] 16510)
130	82	Software limit switch plus (alarm number[1)] 20070)
131	83	Software limit switch minus (alarm number[1)] 20070)
132	84	Working area limitation plus (alarm number[1)] 20071)
133	85	Working area limitation minus (alarm number[1)] 20071)
134	85	Frame not permitted for indexing axis
135	87	Indexing axis with "Hirth joint" is active (alarm number[1)] 17501)
136	88	Indexing axis with "Hirth joint" is active and axis not referenced (alarm number[1)] 17503)
137	89	Spindle operation not possible for transformed spindle/axis (alarm number[1)] 22290)
138	8A	The corresponding effective coordinate-system-specific working area limit plus violated for the axis (alarm number[1)] 20082)
139	8B	The corresponding effective coordinate-system-specific working area limit minus violated for the axis (alarm number[1)] 20082)

Error number		Meaning
Decimal	Hex	
200	C8	System alarm number[1)] 450007
1) The detailed alarm description is contained in: Alarms diagnostics manual; SINUMERIK 828D, SINAMICS S120		

8.5 Start ASUB

8.5.1 Job start

DB340x	ASUP: Job [r/w] (PLC → NC)							
Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
DBB0	-	-	-	-	-	-	-	Start INT1
DBB1	-	-	-	-	-	-	-	Start INT2
DBB2	-	-	-	-	-	-	-	Start INT3
DBB3	-	-	-	-	-	-	-	Start INT4

Interrupts

"Start INT1":

- DBX0.0 = 1: Request to start the interrupt program (ASUP) assigned to INT1.
- DBX0.0 = 0: Reset the ASUP request after acknowledgment in the result interface DB340x.DBB1000.0 - 3.

"Start INT2":

- DBX1.0 = 1: Request to start the interrupt program (ASUP) assigned to INT2.
- DBX1.0 = 0: Reset the ASUP request after acknowledgment in the result interface DB340x.DBB1001.0 - 3.

"Start INT3":

- DBX2.0 = 1: Request to start the interrupt program (ASUP) assigned to INT3.
- DBX2.0 = 0: Reset the ASUP request after acknowledgment in the result interface DB340x.DBB1002.0 - 3.

"Start INT4":

- DBX3.0 = 1: Request to start the interrupt program (ASUP) assigned to INT4.
- DBX3.0 = 0: Reset the ASUP request after acknowledgment in the result interface DB340x.DBB1003.0 - 3.

8.5.2 Job result

DB340x	ASUP: Result [r] (NC → PLC)							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB1000	Signals to start INT1 (DB340x.DBX0.0)							
					ASUP cannot be executed [1]	Interrupt no. not assigned [2]	ASUP is being executed	ASUP completed [3]
DBB1001	Signals to start INT2 (DB340x.DBX1.0)							
					ASUP cannot be executed [1]	Interrupt no. not assigned [2]	ASUP is being executed	ASUP completed [3]
DBB1002	Signals to start INT3 (DB340x.DBX2.0)							
					ASUP cannot be executed [1]	Interrupt no. not assigned [2]	ASUP is being executed	ASUP completed [3]
DBB1003	Signals to start INT4 (DB340x.DBX3.0)							
					ASUP cannot be executed [1]	Interrupt no. not assigned [2]	ASUP is being executed	ASUP completed [3]

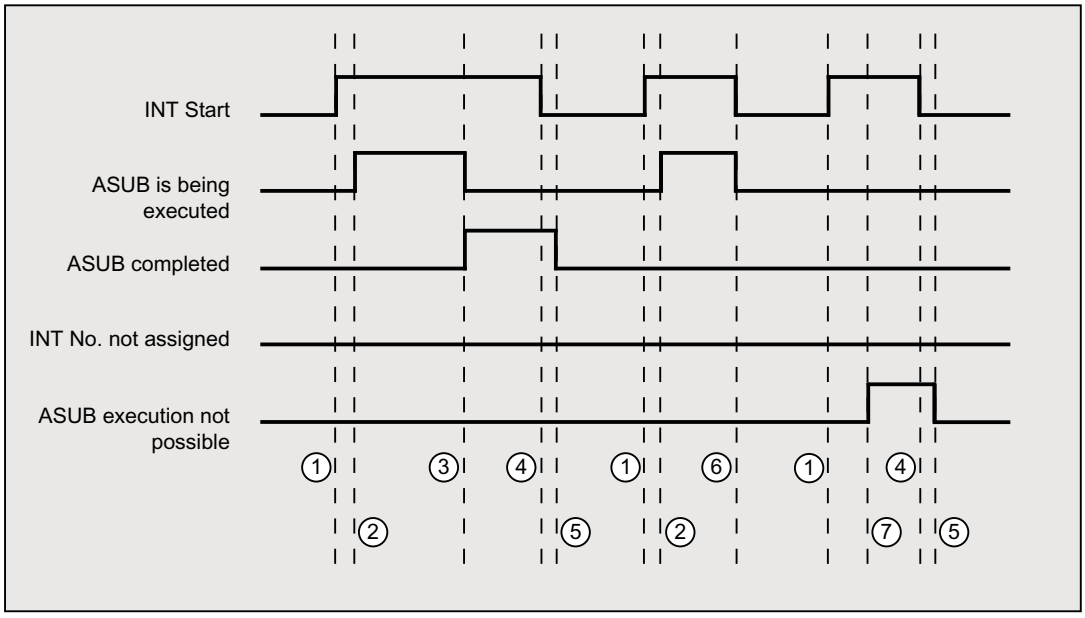
[1] Negative acknowledgment: E.g. for emergency stop or channel reset request.

[2] Negative acknowledgment**:** Number has not been assigned yet. Remedy: Execute PI service "ASUP".

[3] Positive acknowledgment**:** ASUP successfully completed. Reset start signal: DB340x.:DBXn.0 = 0, with n = 0, 1, 2, 3

8.5.3 Signal flow

Signal flow



① Function activated by user with a positive edge of *Start*.
② *ASUP is being executed* is signaled back.
③ The acknowledgement *ASUP completed* indicates the successful execution, *ASUP is being executed* is withdrawn.
④ The signal to initiate the function is reset after receiving the acknowledgement from the user.
⑤ Signal change by the firmware.
⑥ Not permitted! If function activation is reset prior to receipt of acknowledgement, the output signals are not updated – without the operational sequence of the activated function being affected.
⑦ *ASUP cannot be executed*: Negative acknowledgement, error occurred.

Figure 8-1 Example: Signal flow

8.6 Channel selection on the HMI

Function

The channel displayed on the HMI, e.g. in the machine start screen, can be selected from the PLC user program via the HMI/PLC interface.

Requirement

More than one channel is parameterized in the NC.

Job and acknowledgment interface

DB1900			**Channel selection [r/w] (PLC ↔ HMI)**					
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB5011	Error identification (see subsection below) (HMI → PLC)							
...	...							
DBB5021	Status (HMI → PLC)	Require-ment (PLC ↔ HMI)	Function number (PLC → HMI)					
DBB5022	Channel number (see subsection below) (PLC → HMI)							

Channel number

- Channel number: 1, 2, ... max. number of channels
- Next channel: FF_H

Error identification

- 0: No error
- 1: Invalid function number (DBX32.0 - .5)
- 2: Invalid parameter (DBB33 - DBB35)
- 3: Error when writing to HMI-internal variable
- 10: Channel not present (DBB33)

Functional sequence

PLC → HMI

The PLC user program must maintain the following execution sequence:

1. Check whether the interface is free for a new job:
   - `DB1900.DBX`**`5021`**`.6 == 0` (function request)
   - `DB1900.DBX`**`5021`**`.7 == 0` (status)
2. If the interface is free, the job data must be entered and the function request set:
   - `DB1900.DBB`**`5022`** `= <channel number>`
   - `DB1900.DBX`**`5021`**`.0 - .5 = 1` (function number: channel selection)
   - `DB1900.DBX`**`5021`**`.6 = 1` (function request)

HMI → PLC

The HMI makes the following responses for **error-free** parameterization:

1. Once the HMI has recognized the function request for channel selection, the status is set to "function being performed" and the function request reset:
   - `DB1900.DBX`**`5021`**`.7 = 1` (status)
   - `DB1900.DBX`**`5021`**`.6 = 0` (function request)
2. Once the channel selection has been performed, the status is reset again and value 0 is set as error identification:
   - `DB1900.DBX`**`5021`**`.7 = 0` (status)
   - `DB1900.DBX`**`5011`** `= 0` (error identification)

The HMI makes the following responses for **faulty** parameterization:

- The function request is reset and the appropriate error identification is set:
  - `DB1900.DBX`**`5021`**`.6 = 0` (function request)
  - `DB1900.DBX`**`5021`**`.7 = 0` (status)
  - `DB1900.DBX`**`5011`** `= <error identification>`

CNC lock function (option) 9

9.1 Function

Note

The "CNC lock function" is a licensed option (article number: 6FC5800-0AP76-0YB0).

The use of the CNC lock function requires purchase of the appropriate license from SIEMENS. The use of the lock function with a trial license is **not** possible.

NOTICE
License certificate The company that created the CNC lock function (machine manufacturer or dealer) must retain the license certificate for this option (CoL)! This certificate can be used as legitimation for SIEMENS should the PIN be forgotten. The owner of the certificate (CoL) can have the machine unlocked.

The machine manufacturer can use the "CNC lock function" and the encrypted file that created with SINUMERIK Access MyMachine (AMM) Integrate application to activate a lock date in the control system. This allows the use of the machine to be limited to the time until the lock date is reached. The NC Start function of the control system is locked when the lock date is exceeded.

The CNC lock function can be lengthened or deactivated with an additional encrypted file. The machine manufacturer sends this file to the end user if the user has fulfilled the agreed obligations.

9.2 Requirements

The following preconditions must be met for using the "CNC lock function":

- The "CNC lock function" option must be set.
- A PLC project of CPU type "828D Step 2 x.yy" must be used.
  Compatibility mode must be deactivated.
- The SINUMERIK Integrate Access MyMachine/ P2P (PC) application must be installed.

9.3 Restrictions

The CNC lock function supports the business model with time-limited use. This protects against unauthorized use beyond the set interval. The direct access to the CNC, however, makes it possible to circumvent the function. The CNC lock function does not offer an absolute protection against manipulation. Unauthorized use of the machine is precluded by locking the automatic mode of the CNC. Because a running automatic program cannot be interrupted, this can extend the runtime beyond the lock date. All other functions of the SINUMERIK control system remain available.

To permit the CNC lock function to act, support of the machine manufacturer is required. Consequently, the following note and supplementary conditions must be observed when the CNC lock function is used!

Note

The CNC lock function is based on a connection of the PLC project to the associated SINUMERIK control system. The SINUMERIK controller consists of a combination of (P)PU and CF card/SD Card with system software.

Constraints

- Manipulation attempts and/or inconsistencies can lead to the CNC lock function causing a machine standstill.
- The use of the CNC lock function may require additional service calls of the machine manufacturer or dealer at the customer site.
- The PLC project should never be given to the customer without saved OEM PIN. The use of a "free" PLC project allows circumvention of the CNC lock function!
- A reimplementation of the PLC project of the associated machine tool allows circumvention of the CNC lock function!
- The protection of the program organization units in the PLC of the SINUMERIK must be used. Activation in the PLC Programming Tool is possible. The coding of the PLC project must be kept secret.
- To provide better protection, each machine must be given its own OEM PIN.
- Before setting up the lock function for the first time (see Chapter "Initial creation of the CNC lock function (Page 107)"), the setting up engineer must correctly set the date and the time in the SINUMERIK control. If the date lies in the past, then the operating time of the machine extends corresponding to the difference to the real date.
- The CNC lock function is built on the real-time clock of the SINUMERIK 828D. The maintenance-free design of the SINUMERIK 828D can cause the time of day to be lost. The CNC lock function performs a computerized numerical plausibility check of the time of day. This check can be impaired by power loss to the real-time clock. In this case, the time without power supply is ignored.
- The company that created the CNC lock function retains the associated license certificate (CoL). This certificate serves as proof as authorized function creator to SIEMENS and so implicitly as authorized user of the machine.
- A software malfunction can cause unintentional locking of the control system.

9.4 Protection from manipulation

The CNC lock function as part of the currently expected use and misuse of the CNC serves to permit use only within the set time period. Despite the available protective mechanisms against an impermissible manipulation of the CNC lock function, a residual risk that the protective mechanisms can be circumvented remains. The CNC lock function cyclically checks the installed combination of (P)PU, CF card/SD Card and PLC project. The lock function is not applicable when replacing all three components. To protect against manipulation, it is absolutely essential that the secondary conditions listed in Chapter "Restrictions (Page 106)" are carefully complied with.

Note

The CNC lock function uses a cryptographic technique. When first marketed, the technique used corresponds to state-of-the-art technology. As time goes by, the probability that this technique will be able to be bypassed (manipulated) increases.

9.5 Initial creation of the CNC lock function

The initial setup of the CNC lock function couples the control hardware, the (P)PU, together with the system software on the SD Card and the PLC project that belongs to the machine. An initial lock date is also set at the same time.

To create the lock function, an encrypted lockset file (lockset.clc) appropriate for the hardware must be generated. The file is created with the SINUMERIK Integrate Access MyMachine (AMM) application.

Generating the lockset file

The following data is required to generate the lockset file:

- Serial number of the CF card/SD Card
- Serial number of the controller ((P)PU)
- OEM PIN
- Lock date

Note

The **serial number** of the CF card/SD Card and of the controller ((P)PU) can be found on the SINUMERIK Operate user interface in the "Diagnostics" > "Version" > "Hardware" > "NCU/PLC" > "ncu1" operating area:

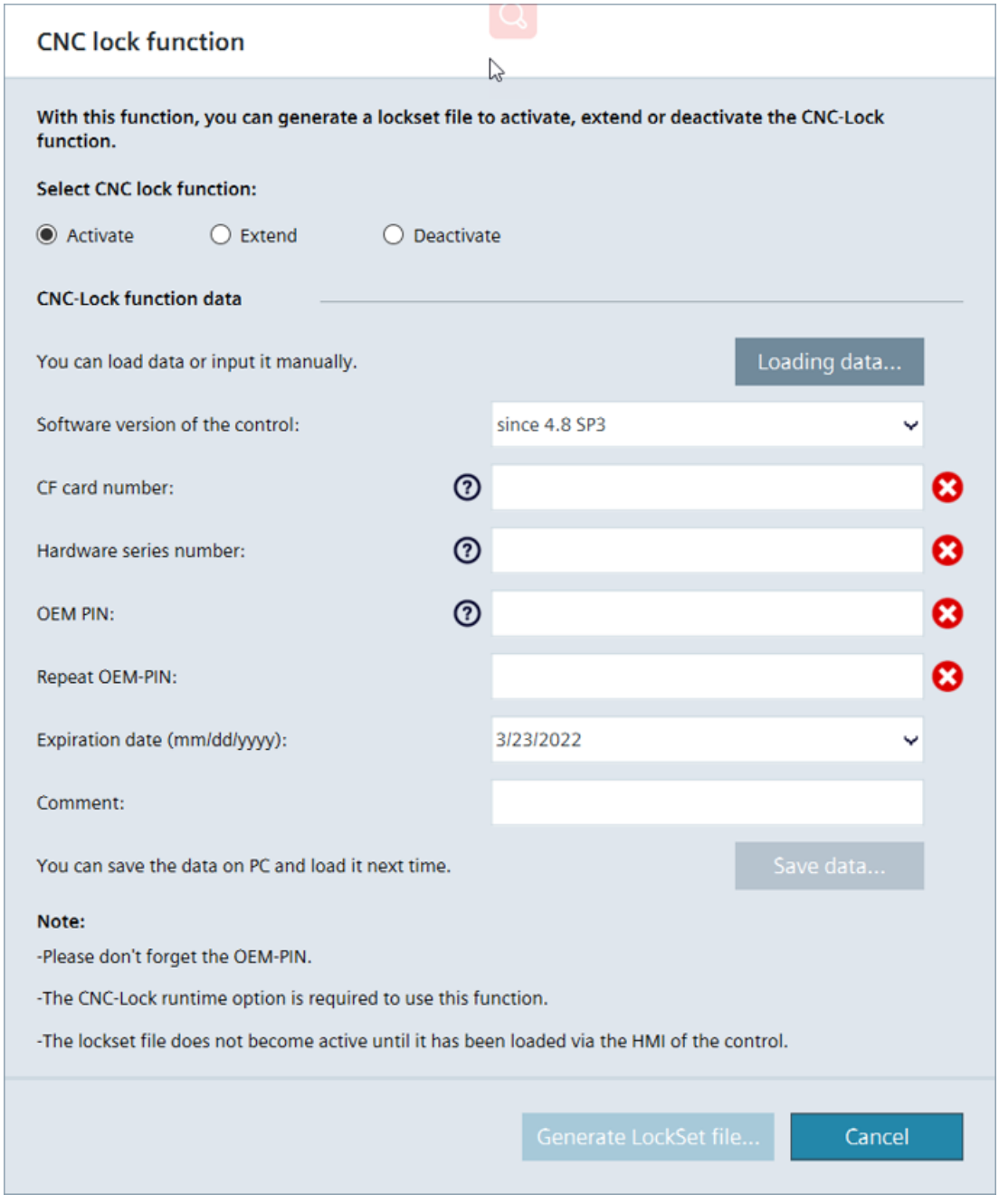
- **CF card:** "CF card" > "SerialNo." area
- **(P)PU:** area "SINUMERIK 828D (P)PU" > "SerialNo."

Note

The **OEM PIN** increases the protection against manipulation of the CNC lock function.

The OEM PIN is stored by the system when activating the CNC lock function in the PLC user program. The OEM PIN cannot be viewed, changed or deleted by the user in the PLC user program.

The data is entered via Access MyMachine in the "CNC lock function" dialog window (called from the main menu: "Tools" > "CNC lock function"). The "**Activate**" option must be selected:



After entering all of the data required, the lockset file to activate is generated using the "Creating lockset file...".

Transferring the lockset file

The lockset file must then be transferred to the control system either directly via an Ethernet connection or alternatively via a storage medium, e.g. USB flash drive.

The file is located at:

/card/user/sinumerik\data\licences or

C:\Program Files (x86)\Siemens\MotionControl\user\sinumerik\data\licences

Reading in the lockset file

Before the lockset file is imported into the control system, the machine manufacturer must set the time of day of the control system correctly, because the time of day at the point in time of activating the CNC lock function is saved as the start value for monitoring. The import can then be started from the user interface: "Commissioning" > "Licenses" > "Import license key" operating area.

No access level is required for reading in.

If no error occurs when importing the lockset file, the CNC lock function is active in the control system.

Note

If an error occurs when importing the lockset file, an error-specific alarm will be issued. The state of the CNC lock function remains unchanged.

Note

We recommend that the machine manufacturer after commissioning the machine and activating the CNC lock function creates a complete **commissioning archive** over all control system components. This ensures data consistency for the CNC lock function. If necessary, this commissioning archive can be used to recommission the control system without requiring a service call to reactivate the CNC lock function.

Note

To read in "*.clc" files, the NC channels of the controller must be in the "reset" state. Otherwise, the "*.clc" file will not be read in.

Checking the lock date

The activation of the CNC lock function is apparent with the lock date entered in the lockset file being displayed on the user interface:

SINUMERIK Operate user interface: "Commissioning" > "Licenses" operating area

Setting the prewarning time

The prewarning time is the time range before reaching the lock date above which alarm 8063 is displayed once daily. The alarm indicates that the lock date has initially been reached and NC Start is locked for the control system. The prewarning time is set via the machine data:

MD17300 $MN_CNC_LOCK_WARNING_TIME

Important notes

The following information must be heeded for the correct and reliable functioning of the CNC lock function!

Note

Before activating the CNC lock function, the **time of day** must be set correctly on the control system.

Note

The PLC user program should always be given the **POU password protection**. This prevents users from copying the machine-specific know-how and using it in their own PLC user program, and then replacing the PLC user program with the PLC user program of the machine manufacturer that contains the PLC key of the CNC lock function.

Note

The **commissioning archive** for the end user may be exported only **after activation** of the CNC lock function.

Note

After deactivation of the CNC lock function (see "Deactivating the CNC lock function (Page 113)"), a **new commissioning archive** must be exported and replaced with the original archive. Only this guarantees that no inadvertent reactivation of the CNC lock function occurs. This would cause an alarm and disable of the NC Start. To revoke this, the lock set file for deactivating the CNC lock function must be reimported.

Note

The machine manufacturer has sole responsibility for the correct and reliable functioning of the CNC lock function.

9.6 Extending the CNC lock function

To extend the CNC lock function, the machine manufacturer must use Access MyMachine (AMM) to create a new lockset file (lockset.clc) **with new lock date** for the CNC lock function.

Generating the lockset file

The following data is required to generate the lockset file:

- Serial number of the CF card/SD Card
- Serial number of the controller ((P)PU)
- OEM PIN
- **New lock date**

Note

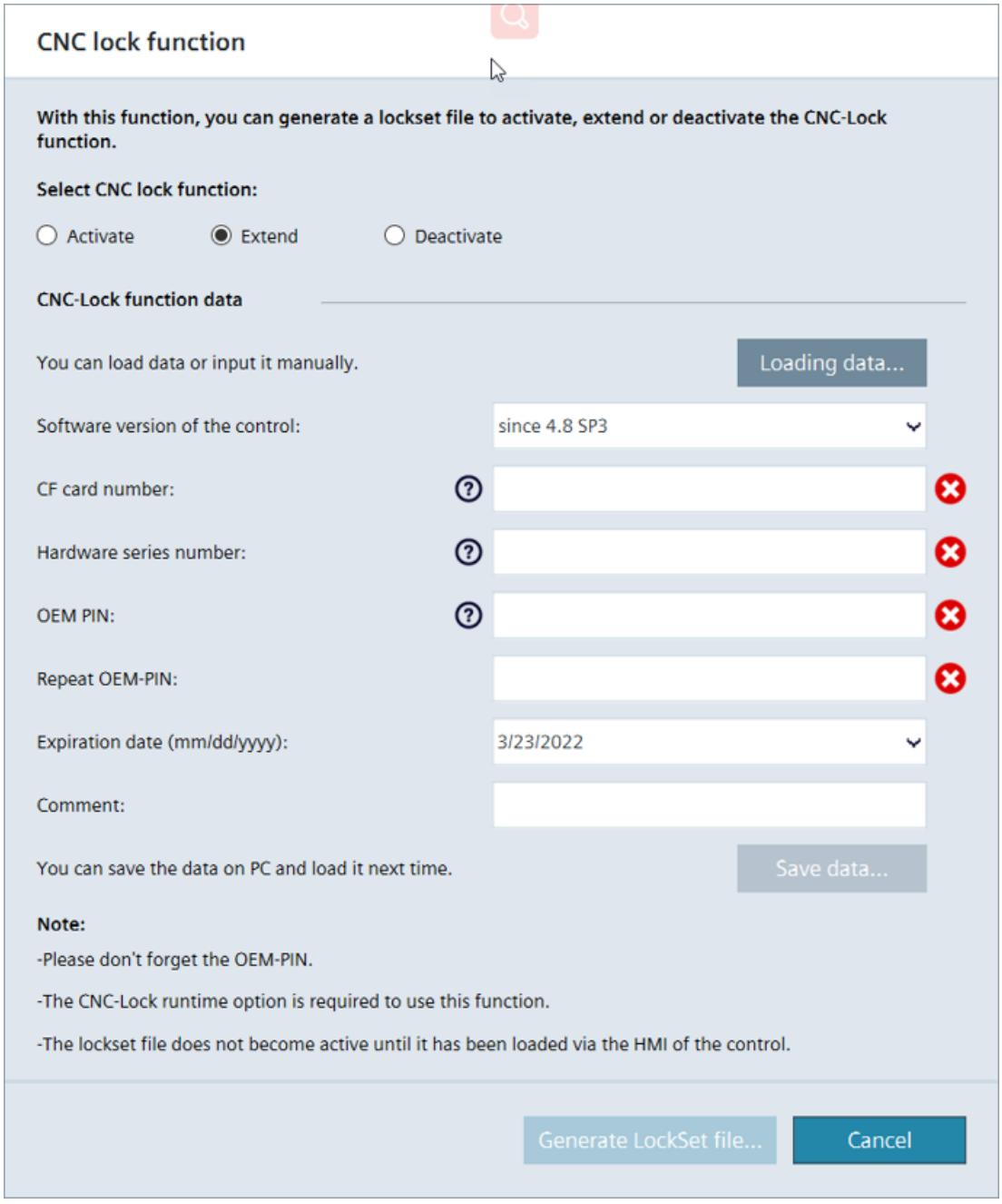
The serial numbers of the CF card/SD Card and the control ((P)PU) as well as the OEM PIN must match the values used to activate the CNC lock function during initial setup.

Note

The **serial number** of the CF card/SD Card and of the controller ((P)PU) can be found on the SINUMERIK Operate user interface in the "Diagnostics" > "Version" > "Hardware" > "NCU/PLC" > "ncu1" operating area:

- **CF card:** "CF card" > "SerialNo." area
- **(P)PU:** area "SINUMERIK 828D (P)PU" > "SerialNo."

The data is entered via Access MyMachine in the "CNC lock function" dialog window (called from the main menu: "Tools" > "CNC lock function"). The "**Extend**" option must be selected:



After entering all of the data required, the lockset file to extend is generated using the "Creating lockset file...".

Transferring the lockset file

The new lockset file must be transferred to the control system. The transfer can be made by the machine manufacturer directly via an Ethernet connection to the control system.

The file is located at:

/card/user/sinumerik\data\licences or

C:\Program Files (x86)\Siemens\MotionControl\user\sinumerik\data\licences

Or the machine manufacturer sends the new lockset file to the end user who transfers the file to the control system.

Reading in the lockset file

The lockset file import is started from the user interface: "Commissioning" > "Licenses" > "Import license key" operating area.

No access level is required for reading in.

If no error occurs when importing the lockset file, the CNC lock function with the new lock date is active in the control system.

Note

If an error occurs when importing the lockset file, an error-specific alarm will be issued. The state of the CNC lock function remains unchanged.

Checking the changed lock date

The successful change of the lock date in the control system can be checked on the user interface:

SINUMERIK Operate user interface: "Commissioning" > "Licenses" operating area

9.7 Deactivating the CNC lock function

To deactivate the CNC lock function, the machine manufacturer must use Access MyMachine (AMM) to create a lockset file (lockset.clc) **without lock date**.

Generating the lockset file

The following data is required to generate the lockset file:

- Serial number of the CF card/SD Card
- Serial number of the controller ((P)PU)
- OEM PIN

Note

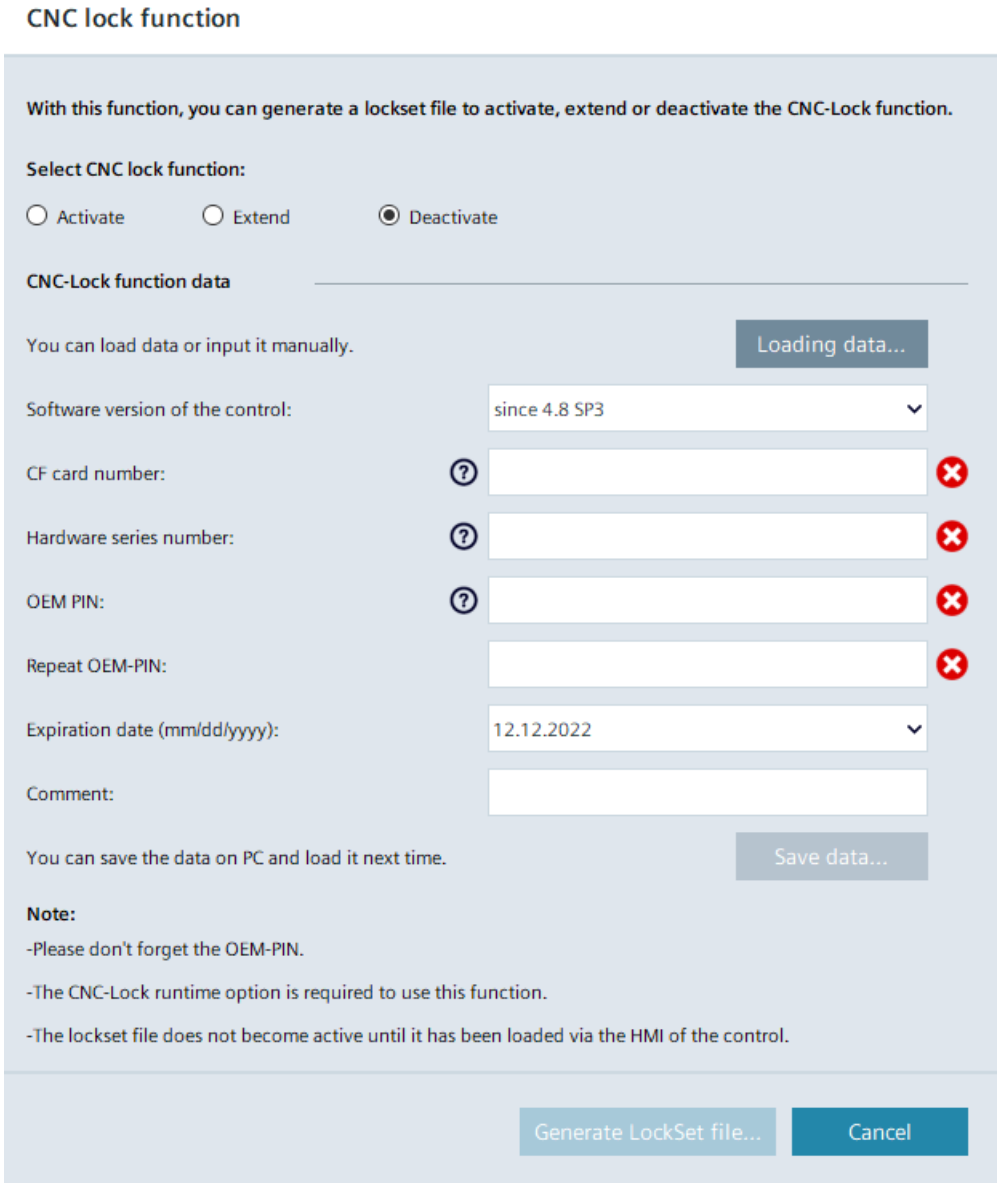
The serial numbers of the CF card/SD Card and the control ((P)PU) as well as the OEM PIN must match the values used to activate the CNC lock function during initial setup.

Note

The **serial number** of the CF card/SD Card and of the controller ((P)PU) can be found on the SINUMERIK Operate user interface in the "Diagnostics" > "Version" > "Hardware" > "NCU/PLC" > "ncu1" operating area:

- **CF card:** "CF card" > "SerialNo." area
- **(P)PU:** area "SINUMERIK 828D (P)PU" > "SerialNo."

The data is entered via Access MyMachine in the "CNC lock function" dialog window (called from the main menu: "Tools" > "CNC lock function"). The "**Deactivate**" option must be selected:



After entering all of the data required, the lockset file to deactivate is generated using the "Creating lockset file...".

Transferring the lockset file

The new lockset file must be transferred to the control system. The transfer can be made by the machine manufacturer directly via an Ethernet connection to the control system.

The file is located at:

//card/user/sinumerik\data\licences or

C:\Program Files (x86)\Siemens\MotionControl\user\sinumerik\data\licences

Or the machine manufacturer sends the new lockset file to the end user who transfers the file to the control system.

Reading in the lockset file

The lockset file import is started from the user interface: "Commissioning" > "Licenses" > "Import license key" operating area.

No access level is required for reading in.

If no error occurs when importing the lockset file, the CNC lock function is deactivated.

Note

If an error occurs when importing the lockset file, an error-specific alarm will be issued. The state of the CNC lock function remains unchanged.

Note

We recommend that the end user **after deactivating** the lock date creates a complete **commissioning archive** over all control system components. If necessary, this commissioning archive can be used to recommission the control system without reactivating the CNC lock function.

Check

The successful deactivation of the lock date in the control system can be checked by the lock date no longer being displayed on the user interface:

SINUMERIK Operate user interface: "Commissioning" > "Licenses" operating area

9.8 Replacing a defective control hardware ((P)PU)

When replacing a defective control hardware ((P)PU), the user SD Card must remain in the machine so it can be deployed in the new control hardware.

After the initial power up of the control system with the new hardware, an existing commissioning archive created with the previous control system hardware must be imported.

After the next power up of the control system, alarm 8062: "CNC lock function: The execution of the function failed: Cause 2" (the hardware has been replaced) is displayed and NC Start disabled. The cause of the alarm is the new serial number of the new control system hardware.

Requesting a new lockset file

To unlock the control system again, the end user must request a new lockset file (lockset.clc) appropriate for the control system from the company that created the CNC lock function (machine manufacturer or dealer).

Generating the lockset file

The following data is required to generate the lockset file:

- Serial number of the CF card/SD Card remaining with the machine
- Serial number of the **new** controller ((P)PU)
- The originally assigned OEM PIN
- Last lock date or new lock date

Note

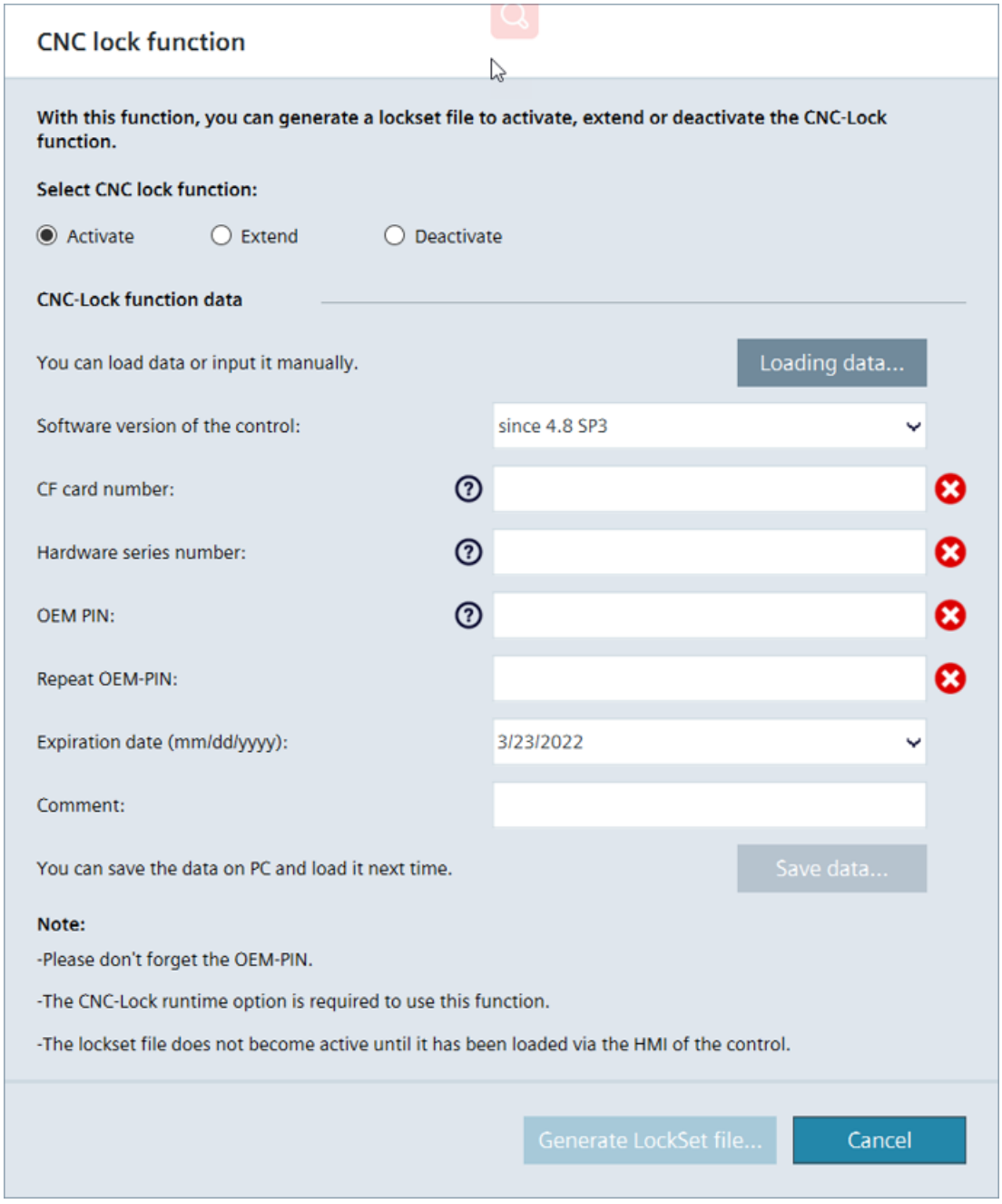
The originally assigned **OEM PIN** must be known for the replacement of a defective control hardware ((P)PU) by the CNC lock function setter!

Note

The **serial number** of the CF card/SD Card and of the controller ((P)PU) can be found on the SINUMERIK Operate user interface in the "Diagnostics" > "Version" > "Hardware" > "NCU/PLC" > "ncu1" operating area:

- **CF card:** "CF card" > "SerialNo." area
- **(P)PU:** area "SINUMERIK 828D (P)PU" > "SerialNo."

The data is entered via Access MyMachine in the "CNC lock function" dialog window (called from the main menu: "Tools" > "CNC lock function"). The "**Activate**" button must be selected:



After entering all of the data required, the lockset file to unlock is generated using the "Create lockset file... button".

Transferring the lockset file

The new lockset file must be transferred to the control system. The transfer can be made by the machine manufacturer directly via an Ethernet connection to the control system.

The file is located at:

//card/user/sinumerik\data\licences or

C:\Program Files (x86)\Siemens\MotionControl\user\sinumerik\data\licences

Or the machine manufacturer sends the new lockset file to the end user who transfers the file to the control system.

Reading in the lockset file

Note

Before the lockset file **is imported**, the **time of day** of the new control system hardware must be set correctly, because the time of day at the time of the activation of the CNC lock function is saved as the start value for monitoring. The company that created the CNC lock function can protect the action by the replacement and the setting of the time of day being made by the service personnel.

The lockset file import is started from the user interface: "Commissioning" > "Licenses" > "Import license key" operating area.

No access level is required for reading in.

If no error occurs when importing the lockset file, the CNC lock function is active in the new control system.

9.9 Replacing a defective SD Card

After replacing a defective user SD Card, it must be sent to SIEMENS. In return, SIEMENS supplies a new SD Card.

After the initial power up of the control system with the new SD Card, an existing commissioning archive created with the previous control system hardware must be imported. After the next power up of the control system, alarm 8062: "CNC lock function: The execution of the function failed: Cause 1" (the SD Card has been replaced) is displayed and the NC-Start locked. The cause of the alarm is the new serial number of the new SD Card.

Requesting a new lockset file

To unlock the control system again, the end user must request a new lockset file (lockset.clc) appropriate for the control system from the company that created the CNC lock function (machine manufacturer or dealer).

Generating the lockset file

The following data is required to generate the lockset file:

- Serial number of the **new** CF card/SD Card
- Serial number of the controller ((P)PU)
- The originally assigned OEM PIN
- The lock date in accordance with the status of the CNC lock function (last lock date, new lock date, no lock date)

Note

The originally assigned **OEM PIN** must be known to the company that created the CNC lock function for the replacement of defective SD Card!

Note

The **serial number** of the CF card/SD Card and of the controller ((P)PU) can be found on the SINUMERIK Operate user interface in the "Diagnostics" > "Version" > "Hardware" > "NCU/PLC" > "ncu1" operating area:

- **CF card:** "CF card" > "SerialNo." area
- **(P)PU:** "SINUMERIK 828D PPU" > "SerialNo." area

The data is entered via Access MyMachine in the "CNC lock function" dialog window (called from the main menu: "Tools" > "CNC lock function"). The "**Extend**" or "**Deactivate**" button must be selected:

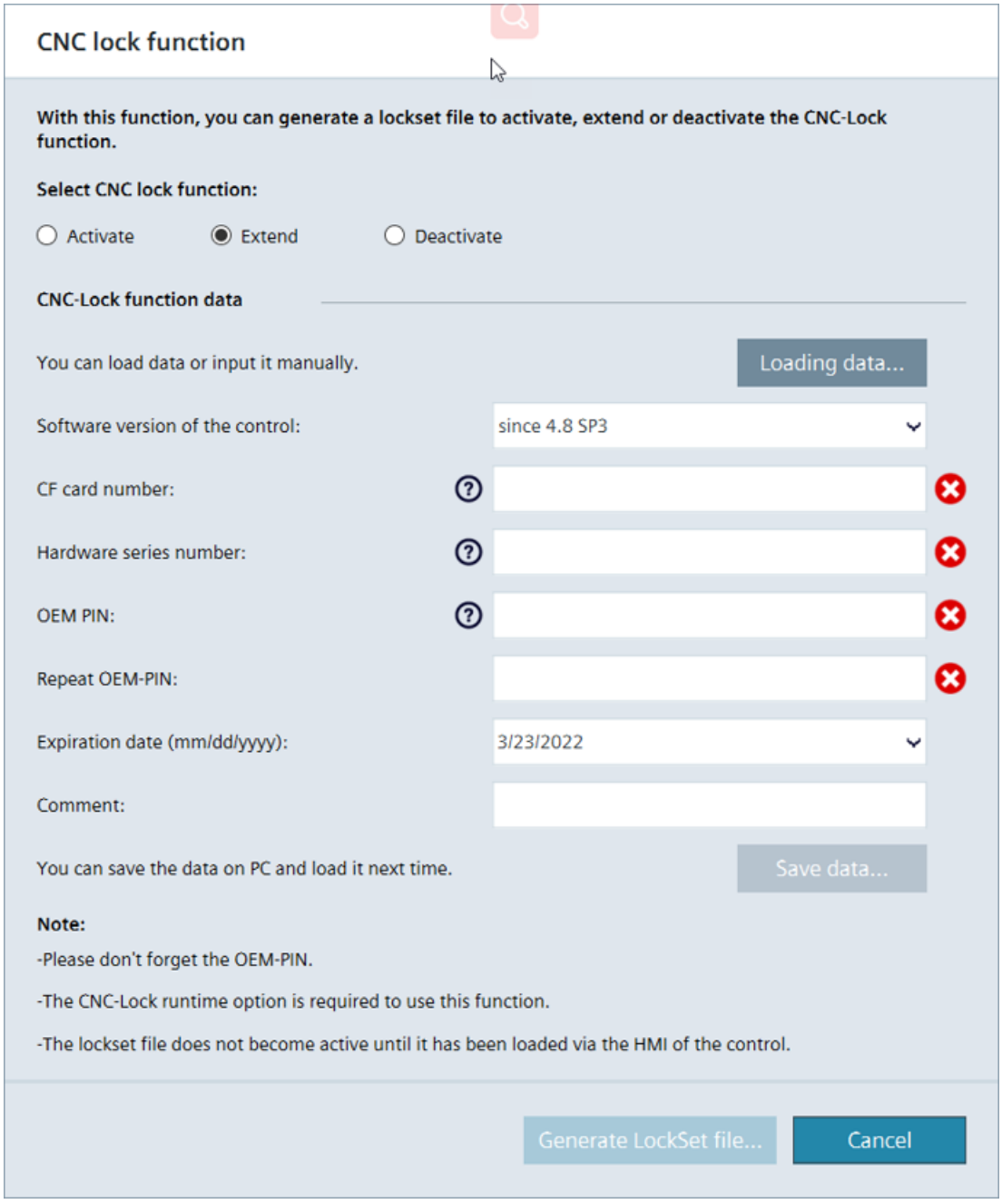


Figure 9-1 Update CNC lock function

After entering all of the data required, the lockset file to unlock is generated using the "Create lockset file... button".

Transferring the lockset file

The new lockset file must be transferred to the control system. The transfer can be made by the machine manufacturer directly via an Ethernet connection to the control system.

The file is located at:

/card/user/sinumerik\data\licences or

C:\Program Files (x86)\Siemens\MotionControl\user\sinumerik\data\licences

Or the machine manufacturer sends the new lockset file to the end user who transfers the file to the control system.

Reading in the lockset file

Note

Before the lockset file **is imported**, the **time of day** of the new control system hardware must be set correctly, because the time of day at the time of the activation of the CNC lock function is saved as the start value for monitoring. The company that created the CNC lock function can protect the action by the replacement and the setting of the time of day being made by the service personnel.

The lockset file import is started from the user interface: "Commissioning" > "Licenses" > "Import license key" operating area.

No access level is required for reading in.

If no error occurs when importing the lockset file, the CNC lock function is active in the new control system.

9.10 OEM PIN forgotten

The company that created the CNC lock function (machine manufacturer or dealer) has forgotten the OEM PIN that was assigned during the initial creation and so can no longer create a valid lockset file for the associated control system.

Unlocking the machine

To allow the company that created the CNC lock function to operate the machine, the technician must contact the SIEMENS Hotline and provide the following information:

- License certificate (CoL) for the "CNC lock function" option
- Serial number of the CF card/SD Card
- Serial number of the controller ((P)PU)
- Software version of the CNC software

Note

The **serial number** of the CF card/SD Card and of the controller ((P)PU) can be found on the SINUMERIK Operate user interface in the "Diagnostics" > "Version" > "Hardware" > "NCU/PLC" > "ncu1" operating area:

- **CF card:** "CF card" > "SerialNo." area
- **(P)PU:** area "SINUMERIK 828D (P)PU" > "SerialNo."

The **software version of the CNC software** can be found on the SINUMERIK Operate user interface in the "Diagnostics" > "Version" > "Actual version" operating area.

The original license certificate (CoL) must be sent to SIEMENS. Unlocking by SIEMENS involves a fee.

The company that created the CNC lock function receives from the Hotline the lockset file to unlock the machine. The unlocking acts, however, only on the hardware of the control system ((P)PU). The PLC project is not unlocked. For this reason, the original PLC project appropriate for the machine must be available.

The unlocking of the machine requires the on-site presence of a service technician of the creator of the CNC lock function and the end user (operating company) of the machine.

More information concerning the procedure can be obtained from the SIEMENS Hotline.

9.11 Other information

Project file

Note

The machine manufacturer is responsible for documenting the assignments of the serial numbers and OEM PINs.

Access MyMachine can be used to create an unencrypted project file ("ucls" for "**U**ser-**C**NC-**L**ock-**S**et file") that contains the following data:

- Serial number of the CF card/SD Card
- Serial number of the controller ((P)PU)
- OEM PIN
- Creation date
- Lock date

This function is called using the "Save data..." button in the "CNC lock function" dialog window.

Clicking the "Load data..." button reimports the unencrypted data stored in the project file.

Faulty settings for date or time of day

If incorrect settings for date or time of day are determined for activated CNC lock function, then the following actions are initiated:

- Alarm 8065 is output: "CNC lock function: Please correctly set the date/time of day!"
- Blocking an NC start

The incorrect settings must be corrected before switching off the control in order to withdraw the lock.

NOTICE
Permanent lock The incorrect date or time of day setting must be corrected before switching off the control. Otherwise there is a risk of a permanent lock through alarm 8064: "CNC lock function: The lock date has been reached, the NC cannot be started!" Remedy: Correctly set the date/time of day **before** switching off the control.

If, with the CNC lock function activated, a future date is set, then the following alarm is output:

Alarm 8066 "CNC lock function: Changing the date would reduce the remaining runtime!"

The date can still be corrected as long as the control system was not switched off.

NOTICE
Shorter service life After switching off the control system, a date set in the future is considered as being an actual date and can no longer be reset. This reduces the service life until the lock date. Remedy: Correctly set the date **before** switching off the control.

More information

See:

- Online help for SINUMERIK Integrate Access MyMachine / P2P (PC)
- Online help for the PLC Programming Tool

Interface signals 10

10.1 Interface signals - overview

10.1.1 Explanations on the interface signals

10.1.1.1 Addressing range of the target system

The address range of a memory type is the range that spans the lowest and highest possible address numbers. The lowest and highest possible address number depends on the particular memory type.

If you execute operations which communicate with the target system, then the Programming Tool PLC828 recognizes your CPU version. When generating your program, you must ensure that you only use the address range valid for this CPU. If you attempt to load a program that accesses address ranges which are not valid for this CPU, then an error message is output.

See the following online help for the address number ranges of the individual addresses: "SINUMERIK 828D PLC Programming Tool".

Address ranges in the variable memory

Table 10-1 Address ranges

Access	Address identifier memory type	Description
Bit (byte.bit)	I	Image of digital inputs
	Q	Image of digital outputs
	M	Bit memory
	SM	Special bit memory
	T	Times
	C	Counter
	L	
	V	
Byte	IB	
	QB	
	MB	
	SMB	
	LB	
	AC	

Access	Address identifier memory type	Description
Word	IW	
	QW	
	MW	
	T	
	C	
	LW	
	AC	
Double word	ID	
	QD	
	MD	
	LD	
	AC	
User interface	DB	Data
User data blocks	DB	Data
Special data blocks	DB	Data

The access type is part of the address notation and must not be considered to be the same as the data type or confused with it, see Section: Data types (Page 129)

Note

The permitted **offset** for an address is dependent on the access:

- Bit or byte access: Any offset permitted.
  Byte-size variables are placed one beside another seamlessly in a DB.
- Word access: Offset must be divisible by 2.
  Word variables (2 bytes) are always saved on even offsets.
- Double word access: Offset must be divisible by 4.
  Double word variables (4 bytes) are always saved on offsets which are divisible by 4.

See Section: Data types (Page 129)

User interface is an interface comprising data blocks that the firmware creates on the target system. It is used to exchange data between the PLC on one side and the NC and HMI on the other side.

This DB neither has to be loaded from the CPU nor into the CPU because it is created by the firmware and therefore belongs to the system.

User data blocks are exclusively created by the user. If it is intended to indirectly access blocks of the same structure, then these should be located one after the other regarding the numbering.

Special data blocks are permanently specified as far as their structure is concerned from the system and can be found in the Programming Tool PLC828 in "Libraries". However, whether they are integrated in the user program, assigned to a data class and loaded into the CPU is the responsibility of the users and their design philosophy (if e.g. a maintenance planner is not used, then these do not have to be integrated as far as the DB is concerned).

10.1.1.2 Addressing

Direct addressing

For direct addressing, the *memory type* as well as the *address number* must be specified.

The CPU memory (V, I, Q, M and SM) can be accessed bit by bit as well as in the byte, word and double-word format. The direct address comprises the memory type and a valid address number.

To access a bit in a memory area, enter the byte address and the number of the bits. Separate the byte from the bit using a decimal point.

Examples:

DB9900.DBX20.0	Bit 0 in byte 20 of DB9900
MB21,	Flag byte 21
QD16,	Output double word 16
I1.7,	Bit 7 in input byte 1

Indirect addressing

Indirect addressing can only be used for data blocks with the same structure (the same type). These are used so that when accessing data blocks, the number of the data block can be variably addressed. The data block number must be located in one of the accumulators AC0 ... AC3.

Absolute and symbolic addressing

You can identify the operands of the instructions in your program absolutely or symbolically.

An *absolute address* specifies the memory type and the address number.

A *symbolic address* (briefly: symbol) specifies the address using a name (a combination of alphanumeric characters).

Global symbols are assigned in the symbol tables to their absolute address values and are valid throughout the project (global). This assignment can be made at any time.

Local symbols are assigned in the local variable table of the particular program and are only valid in this program (local).

Examples for displaying addresses in the program editor:

I0.0	An absolute address specifies the memory type and address number.
#Input1	The # character is located in front of a local symbol.
INPUT1	Global symbol
??.? or ????	Red question marks indicate an undefined address (must be defined before the program is compiled).

Both addressing types – absolute and symbolic – are coupled to the particular view:

Menu "View" > "Symbolic addressing (Ctrl +Y)"

This setting should always be set using the menu "View" > "Symbol table (Ctrl +T)".

Recommendation: Decide on one of the two addressing types and then stick to it.

Global and local range of validity

Symbolic addresses that were assigned in the symbol table are globally valid. Symbolic addresses that were assigned in a local variable table are locally valid.

Local variables

Local variables are assigned in the local variable table of the particular POU and are limited to the validity range of the POU in which they were set-up. Each program organizational unit has its own local variable table.

Example:

You define a variable with the name INPUT1 in the local variable table of a subprogram called SBR1.

If you refer to INPUT1 from SBR1, then the program editor identifies INPUT1 as a local variable from SBR1.

However, if you refer to INPUT1 at another location in the program (e.g. in MAIN or in a second program), the program editor does not recognize INPUT1 as a local variable and treats INPUT1 as a non-defined global symbol.

Note

Assigning names to local and global symbols

If you use the same name for an address at the local and at the global level, then the local use has priority. This means that if the program editor defines a definition for the name in the local variable table of a certain program block, then this definition is used. If a definition is not found, then the program editor checks the symbol table.

Example:

You define the global symbol "PumpOn". You also define "PumpOn" as local variable in SBR2, however, not in SBR1.

If the program is compiled, the local definition for "PumpOn" in SBR2 is used. The global definition is used for "PumpOn" in SBR1.

Note

Using local and global symbols

Local variables use the temporary, local memory of the target system. Subprograms that only use local variables and transfer parameters, are easy to port and can be flexibly used.

If you wish to use a parameter in several program organizational units, then it makes sense to define this parameter as global symbol in the symbol table - and not in the local variable table. The reason for this is that you would have to include the parameter in every local variable table of the individual POUs.

Note

Initialization of local variables

As local variables occupy temporary memories, you must initialize the local variables in the POU each time the POU is called. You **cannot** assume that a local variable keeps a data value from one POU call to the next.

10.1.1.3 Data types

When defining symbols in the global symbol table, a data type does not have to be explicitly specified, as it is implicitly specified by the data associated with the symbol.

If you assign values in the local variable table, then you must specify a data type for every local variable.

By explicitly specifying a data type for a value, you give the Programming Tool PLC828 clear instructions how much memory must be assigned for the value (e.g. the value 100 can be stored as byte, word or doubleword) and how the value is to be represented (e.g. should 0 be interpreted as BOOL or as numerical value?).

The operations and parameterized subprograms are recognized using a precise definition. This definition is also called signature. For all standardized operations, the data types permissible for the addresses of the operation are specified in the signature. For parameterized subprograms, the signature of the subprogram is generated by the user in the local variable table.

Data type check

The Programming Tool PLC828 offers a simple data type check. If a data type is specified for a local or global variable, the software checks that the data type of the address corresponds to the signature of the operation.

Elementary data types	Description	Memory area
BOOL (bit)	Boolean	0 ... 1
BYTE	Byte, unsigned	0 ... 255
WORD	Integer number (16-bit)	-32768 ... +32767
DWORD (Double Word)	Integer number (32-bit)	-2147483648 ... +2147483647
REAL	32-bit floating point	$+/- 10^{-37}$ ... $+/- 10^{+38}$

Complex data types	Description	Memory area
TON	Switch-on delay	100 ms T0 ... T15 10 ms from T16
TOF	Switch-off delay	100 ms T0 ... T15 10 ms from T16
TONR	Switch-on delay, latching	100 ms T0 ... T15 10 ms from T16
CTU	Up counter	C0 ... C63

Complex data types	Description	Memory area
CTD	Down counter	C0 ... C63
CTUD	Up-down counter	C0 ... C63

The Programming Tool PLC828 has two data type check stages:

1. Elementary data type check

For the elementary data type check, if a symbol or a variable is assigned a data type, then all data types are automatically assigned, which correspond to the bit size of the user-defined data type. If, for instance, you specify DINT as data type, then the local variable is also automatically assigned the DWORD data type, because both data types are 32-bit types. The REAL data type is not automatically assigned although it also involves a 32-bit data type. The REAL data type is defined so that it does not have any equivalent data types: it is always clear. The elementary data type check is only performed when using local variables.

User-defined data types	Equivalent data type
BOOL	BOOL
BYTE	BYTE
WORD	WORD, INT
INT	WORD, INT
DWORD	DWORD, INT
DINT	DWORD, DINT
REAL	REAL

2. No data check

This mode is only available for global variables where no data types can be specified. If a data type check is not active, all data types of the same size are automatically assigned to the symbol.

Example:

If a symbol is assigned to address DB1400.DBD4, then the following data types are automatically assigned by the programming software: DWORD, DINT and REAL.

User-defined address	Assigned equivalent data type
DB1400.DBX0.0	BOOL
DB1400.DBB0	BYTE
DB1400.DBW2	WORD, INT
DB1400.DBD4	DWORD, DINT, REAL

Advantages of the data type check

The data type check helps you to avoid programming errors that have been widely propagated through the program. If an operation supports numbers with signs, the Programming Tool PLC828 designates the use of unsigned numbers in addresses of operations.

Example:

The comparison < I is an operation with sign. -1 is less than 0 for addresses with sign. However, if the operation < I supports unsigned data types, then the programming itself must ensure that the following does not occur: While a program is being executed, an

unsigned value of 40.000 is actually smaller than 0 for the operation < I. If it cannot be guaranteed that the unsigned numbers for signed operations do not exceed the positive and negative limit values, then unpredictable events can occur in your program or in the mode of operation of the control.

Working with operations to convert the data type

Conversion operations convert one data type into another. The Programming Tool PLC828 supports the following conversion operations to transfer values between the elementary data types.

Conversion of data types	Conversion operations	Complete data type check, permissible addresses	Data check, permissible addresses
INT in BCD	I_BCD	IN: INT OUT: INT	IN: WORD, INT OUT: WORD, INT
BCD in INT	BCD_I	IN: INT OUT: INT	IN: WORD, INT OUT: WORD, INT
DINT in REAL	DI_R	IN. DINT OUT: REAL	IN: DWORD, DINT OUT: REAL
REAL in DINT (ROUND)	TRUNC	IN: REAL OUT: DINT	IN: REAL OUT: DWORD, DINT

10.1.1.4 Special bit memories and their functions

Special bit memories SMB0 (SM0.0 ... SM0.6) contain seven bits that are updated by the PLC firmware at the end of each cycle. You can implement various functions in your program with these bits.

Special bit memories (write protected)	Description
SM0.0	This bit is always switched on.
SM0.1	This bit is switched on in the first cycle. It is used, for example, to call an initialization subprogram.
SM0.2	This bit is switched on for the length of a cycle, if retentive data has been lost. It can be used either as an error bit memory or as a mechanism for calling up special startup sequences.
SM0.3	This bit is switched on for the length of a cycle if the RUN operating mode has been set after switching on (power on). This permits a warm-up time for the system before starting operation.
SM0.4	This bit ensures a cycle that is switched-on for 30 seconds and switched-off for 30 seconds. And more precisely for a cycle time of 1 minute. This way you have an easy to program delay or a cycle time of 1 minute.
SM0.5	This bit ensures a cycle that is switched-on for 0.5 seconds and switched-off for 0.5 seconds. And more precisely for a cycle time of 1 second. This means that you have an easy way of programming a delay time or a cycle time of 1 second.
SM0.6	This bit represents a clock cycle. It is switched-on for one cycle and switched-off for the next cycle. So you can use this bit as a cycle counter input.
SM0.7	Reserved

10.1.2 User data

10.1.2.1 User data 1

Input image MCP 483 USB and MCP 310 USB

Table 10-2 DB1000 ... 100x, user data 1

DB1000 ... 100x	**User data 1**							
Byte	**Bit7**	**Bit6**	**Bit5**	**Bit4**	**Bit3**	**Bit2**	**Bit1**	**Bit0**
DBB0000	Spindle override				Mode			
	D (2^3)	C (2^2)	B (2^1)	A (2^0)	JOG	TEACH IN	MDA	AUTO
DBB0001	Machine function							
	REPOS	REF.	Var. INC					
DBB0002			Spindle start	Spindle stop[1)]	Feed start	Feed stop[1)]	NC start	NC stop[1)]
DBB0003	RESET		Single block	Feed override				
				E (2^4)	D (2^3)	C (2^2)	B (2^1)	A (2^0)
DBB0004	S24	S22	S23		S31	S34	S37	
DBB0005	S32	S33	S35	Travel command in MCS/WCS		S39	S38	S36
DBB0006	Freely assignable customer keys				Reserved			
	S18	S40 (res.)[3)]	S7[2)]	S21				
DBB0007	Freely assignable customer keys							
	S10	S11	S12	S13	S14	S15	S16	S17
DBB0010	User data							
DBB0011	User data							
DBB0012	User data							
DBB0013	User data							

1) These signals are inverted

2) For MCP 310 USB, preassigned with "Coolant", for MCP 483 USB freely assignable customer key.

3) Key not available for MCP 310 USB, for MCP 483 USB freely assignable customer key.

More information:

- Equipment Manual for SINUMERIK 828D PU and components

Input image MCP 483 USB and MCP 310 USB

Table 10-3 DB1000 ... 100x, user data 1

DB1000 ... 100x	User data 1							
Byte	**Bit7**	**Bit6**	**Bit5**	**Bit4**	**Bit3**	**Bit2**	**Bit1**	**Bit0**
DBB1000	Version information of the MCP USB - byte 0							
DBB1001	Version information of the MCP USB - byte 1							
DBB1002	Version information of the MCP USB - byte 2							
DBB1003	Version information of the MCP USB - byte 3							

More information:

- Equipment Manual for SINUMERIK 828D PU and components

DB1000 ... 100x, input image HT 10

Input image HT 10

Table 10-4 DB1000 ... 100x, signals from the handheld unit HT 10 → PLC

DB1000 ... 100x	Input image HT 10							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB0000							Reset	(WCS/MCS)
DBB0001	U U key	{U4}	{U3}		{U2}	{U1}		
DBB0002								
DBB0003	JOG keys HT 10							
	Plus	Minus						
DBB0004	{U9}	{U10}	{U11}	{U12}	{U13}	{U14}	{U15}	{U16}
DBB0005		{U8}	{U7}	{U6}	{U5}	(SBL)		Rapid traverse
DBB0006	HW1*)	HW0*)	(SF2)	(SF1)	(SF4)	(SF3)	Start	Stop
DBB0007				Feedrate override				
				E	D	C	B	A

The keys enclosed with ( ) are not available as hardware keys for HT 10, but are available as softkeys in the USER/CPF menu (vertical softkey bar).

The keys enclosed with { } are not available as hardware keys for HT 10, but are available as softkeys in the USER/CPF menu (horizontal softkey bar).

*) For HT 10, bit HW0=0 and HW1=1

More information:

- Equipment Manual HT 10 Handheld Terminal

DB1000 ... 100x, status signals HT 10

Status signals HT 10

Table 10-5 DB1000 ... 100x, status signals from HT 10 → PLC

DB1000 ... 100x	Status signals HT 10							
Byte	**Bit7**	**Bit6**	**Bit5**	**Bit4**	**Bit3**	**Bit2**	**Bit1**	**Bit0**
DBB1000							Establishing/disconnecting the connection	Connection active
DBB1001	Reserved							
DBB1002	Reserved							

More information:

- Equipment Manual HT 10 Handheld Terminal

10.1.2.2 User data 2

Output image, MCP 483 USB and MCP 310 USB

Table 10-6 DB1100 ... 110x, user data 2

DB1100 ... 110x	User data 2							
Byte	**Bit7**	**Bit6**	**Bit5**	**Bit4**	**Bit3**	**Bit2**	**Bit1**	**Bit0**
DBB0000					Mode			
					JOG	TEACH IN	MDA	AUTO
DBB0001					Machine function			
	Feed start	Feed stop[1)]	NC start	NC stop[1)]	REPOS	REF.	Var. INC	
DBB0002	S22	S31	S34	S37		Single block	Spindle start	Spindle stop[1)]
DBB0003	S33	S35	Travel command in MCS/WCS		S39	S38	S36	S24
DBB0004	Freely assignable customer keys							
	S18	S40 (res.)[3)]	S7[2)]	S21				S32
DBB0005	Freely assignable customer keys							
	S10	S11	S12	S13	S14	S15	S16	S17
DBB0006							RESET	S23
DBB0007								
DBB0008	7-segment display LED 1							

DB1100 ... 110x	User data 2							
Byte	**Bit7**	**Bit6**	**Bit5**	**Bit4**	**Bit3**	**Bit2**	**Bit1**	**Bit0**
DBB0009	7-segment display LED 2							
DBB0010								
DBB0011								
DBB0012					DP			
							DP2	DP1
DBB0013								
DBB0014	User data							
DBB0015	User data							

1) These signals are inverted

2) For MCP 310 USB, preassigned with "Coolant", for MCP 483 USB freely assignable customer key.

3) Key not available for MCP 310 USB, for MCP 483 USB freely assignable customer key.

More information:

- Equipment Manual for SINUMERIK 828D PU and components

DB1100 ... 110x, output image HT 10

Output image HT 10

Table 10-7 DB1100 ... 110x, signals from the PLC → handheld unit HT 10

DB1100 ... 110x	Output image HT 10							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB0000							Reset	(WCS/MCS)
DBB0001		{U4}	{U3}		{U2}	{U1}		
DBB0002	JOG+							
DBB0003		JOG-						
DBB0004	{U9}	{U10}	{U11}	{U12}	{U13}	{U14}	{U15}	{U16}
DBB0005		{U8}	{U7}	{U6}	{U5}	(SBL)		Rapid traverse
DBB0006							Start	Stop
DBB0007								

(WCS/MCS) and (SBL): The status bit address can be defined - different from the output image using entries in the "slckcpf.ini" file.

{U1} to {U16}: Small LEDs, for example, can be mapped on the configurable user keys (softkeys). You configure the function in the "slckcpf.ini" file

More information:

- Equipment Manual HT 10 Handheld Terminal

DB1100 ... 110x, status signals HT 10

Status signals HT 10

Table 10-8 DB1100 ... 110x, status signals from the PLC → HT 10

DB1100 ... 110x	**Status signals HT 10**							
Byte	**Bit7**	**Bit6**	**Bit5**	**Bit4**	**Bit3**	**Bit2**	**Bit1**	**Bit0**
DBB1000								Activate connection
DBB1001	Reserved							
DBB1002	Device address (box ID)							

More information:

- Equipment Manual HT 10 Handheld Terminal

10.1.2.3 Read/write NC data: Job/result

Table 10-9 DB1200, read/write NC variables: Job

DB1200	**Read/write NC data [r/w]** **Signals from PLC → NC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB0000							Write variables	Job: Start
DBB0001	Number of variables to be processed in the job							
DBB0002	Reserved							
DBB0003	Reserved							

Table 10-10 DB1200, read/write NC variables: Job

DB1200	**Read/write NC data [r/w]** **Signals from PLC → NC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB1000	Variable index							
DBB1001	Area number							
DBW1002	Line index for the NC variable x (WORD)							
DBW1004	Column index for the NC variable x (WORD)							
DBW1006	Reserved							
DBD1008	Write: Data from NC variable x (data type of the variables: 1...4 bytes) for predefined variables of the "Read/write NC variable" user interface.							
DBD1012	Reserved							

DB1200	**Read/write NC data [r/w]** **Signals from PLC → NC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBD1016	Write: Data from NC variable data from x (REAL) for variables from the following data blocks: DB9910 (Page 210) DB9911 (Page 211) DB9912 (Page 212)							
DBD1020	Write: Data from NC variable x (DWORD / DINT) for variables from the following data blocks: DB9910 (Page 210) DB9911 (Page 211) DB9912 (Page 212)							
DBW1024	Write: Data from NC variable x (WORD / INT) for variables from the following data blocks: DB9910 (Page 210) DB9911 (Page 211) DB9912 (Page 212)							
DBB1026	Write: Data from NC variable x (BYTE) for variables from the following data blocks: DB9910 (Page 210) DB9911 (Page 211) DB9912 (Page 212)							
DBB1027								Write: Data from NC variable x (BOOL) for predefined variable from the following DBs: DB9910 (Page 210) DB9911 (Page 211) DB9912 (Page 212)

Table 10-11 DB1200, read/write NC data: Result

DB1200	**Read/write NC data [r]** **Signals from NC → PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB2000							Error in job	Job completed
DBB2001	Reserved							
DBW2002	Reserved							

Table 10-12 DB1200, read/write NC data: Result

DB1200	**Read/write NC data [r]** **Signals from NC → PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB3000							Error has occurred	Variable valid
DBB3001	Access result							
DBW3002	Reserved							
DBD3004	Read: Data from NC variable x (data type of the variables: 1...4 bytes), for predefined variables of the "Read/write NC variable" user interface							
DBD3008	Reserved							
DBD3012	Reserved							
DBD3016	Read: Data from NC variable data from x (REAL) for variables from the following data blocks: DB9910 (Page 210) DB9911 (Page 211) DB9912 (Page 212)							
DBD3020	Read: Data from NC variable x (DWORD / DINT) for variables from the following data blocks: DB9910 (Page 210) DB9911 (Page 211) DB9912 (Page 212)							
DBW3024	Read: Data from NC variable x (WORD / INT) for variables from the following data blocks: DB9910 (Page 210) DB9911 (Page 211) DB9912 (Page 212)							
DBB3026	Read: Data from NC variable x (BYTE) for variables from the following data blocks: DB9910 (Page 210) DB9911 (Page 211) DB9912 (Page 212)							
DBB3027								Read: Data from NC variable x (BOOL) for predefined variable from the following DBs: DB9910 (Page 210) DB9911 (Page 210) DB9912 (Page 210)

Table 10-13 Access result: DBB3001

Value	Meaning
0	No error
3	Access to object is not permitted
5	Invalid address
10	Object does not exist

10.1.2.4 PI service: Job/result

Table 10-14 DB1200, PI service: Job

DB1200	**PI service: Job [r/w]** **Signal from the PLC → NC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB4000								PI service start
DBB4001	PI index							
DBB4002	Reserved							
DBB4003	Reserved							
DBW4004	PI parameter 1							
DBW4006	PI parameter 2							
DBW4008	PI parameter 3							
DBW4010	PI parameter 4							
DBW4012	PI parameter 5							
DBW4014	PI parameter 6							
DBW4016	PI parameter 7							
DBW4018	PI parameter 8							
DBW4020	PI parameter 9							
DBW4022	PI parameter 10							

Table 10-15 DB1200, PI service: Result

DB1200	**PI service: Job [r]** **Signal from the NC → PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB5000							Error in job	Job completed
DBB5001	Reserved							
DBB5002	Reserved							

More information

See section Job feedback (Page 66)

10.1.3 Retentive data area

Table 10-16 DB1400, retentive data area

DB1400	**Retentive data [r/w]**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB0000	User data							
DBB0001	User data							
DBB0002	User data							
...	...							
DBB0032	User data							
...	...							
DBB0126	User data							
DBB0127	User data							

10.1.4 User alarms

10.1.4.1 Activation user alarms 700000 ... 700247

Table 10-17 DB1600, activation user alarms

DB1600	**Activation of alarm [r/w]** **Signal from PLC → HMI**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB0000	Activation of alarm no.							
	700007	700006	700005	700004	700003	700002	700001	700000
DBB0001	Activation of alarm no.							
	700015	700014	700013	700012	700011	700010	700009	700008
DBB0002	Activation of alarm no.							
	700023	700022	700021	700020	700019	700018	700017	700016
DBB0003	Activation of alarm no.							
	700031	700030	700029	700028	700027	700026	700025	700024
DBB0004	Activation of alarm no.							
	700039	700038	700037	700036	700035	700034	700033	700032
DBB0005	Activation of alarm no.							
	700047	700046	700045	700044	700043	700042	700041	700040
...	....							
DBB0030	Activation of alarm no.							
	700247	700246	700245	700244	700243	700242	700241	700240

10.1.4.2 Variable for user alarms 700000 ... 700247

Table 10-18 DB1600, variables for alarms

DB1600	**Variable for alarm [r/w]** **Signals from PLC → HMI**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBD1000	Variable for alarm 700000							
DBD1004	Variable for alarm 700001							
DBD1008	Variable for alarm 700002							
...	...							
DBD1980	Variable for alarm 700245							
DBD1984	Variable for alarm 700246							
DBD1988	Variable for alarm 700247							

10.1.4.3 Active alarm response

Table 10-19 DB1600, active alarm response

DB1600	**Active alarm response [r]**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB2000	POWER ON	Canceled with following DB DB1600.DBX3000 (Page 142)		PLC stop	Emergency stop	Channel 1 Feed disable for all axes	Read-in disable see also (Page 215)	NC start disable see also (Page 215)
DBB2001						Channel 2 Feed disable for all axes	Read-in disable	NC start disable
DBB2002						Channel 3 Feed disable for all axes	Read-in disable	NC start disable
DBB2003						Channel 4 Feed disable for all axes	Read-in disable	NC start disable

10.1.4.4 Alarm acknowledgement

Table 10-20 DB1600, alarm acknowledgement

DB1600	**Alarm acknowledgment [r/w]**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB3000								Ackn
DBB3001	Reserved							
DBB3002	Reserved							
DBB3003	Reserved							

10.1.4.5 Activation user alarms 701000 ... 701999

Table 10-21 DB1600, activation user alarms

DB1600	**Activation of alarm [r/w]** **Signal from PLC → HMI**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB4000	Activation of alarm no.							
	701007	701006	701005	701004	701003	701002	701001	701000
DBB4001	Activation of alarm no.							
	701015	701014	7010013	701012	7010011	701010	701009	701008
DBB4002	Activation of alarm no.							
	701023	7010022	701021	701020	701019	701018	701017	701016
DBB4003	Activation of alarm no.							
	701031	7010030	701029	701028	701027	701026	701025	701024
DBB4004	Activation of alarm no.							
	701039	701038	701037	701036	701035	701034	701033	701032
DBB4005	Activation of alarm no.							
	701047	701046	701045	701044	701043	701042	701041	701040
...	...							
DBB4124	Activation of alarm no.							
	701999	701998	701997	7010996	701995	701994	701993	701992

10.1.4.6 Variable for user alarms 701000 ... 701999

Table 10-22 DB1600, variables for user alarms

DB1600		Variable for alarm [r/w] Signal from PLC → HMI						
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBD5000	Variable for alarm 701000							
DBD5004	Variable for alarm 701001							
DBD5008	Variable for alarm 701002							
	...							
DBD5980	Variable for alarm 701245							
DBD5984	Variable for alarm 701246							
DBD5988	Variable for alarm 701247							

10.1.5 Signals from/to HMI

Table 10-23 DB1700 ...170x, program control from HMI

DB1700 ... DB170x	Signals from HMI [r/w] HMI → PLC							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB0000		Dry run feedrate selected see also (Page 217)	M01 selected see also (Page 216)		DRF selected see also (Page 216)		Configured stop funct. (CST) selected see also (Page 216)	
DBB0001	Program test selected see also (Page 217)				Feedrate override selected for rapid traverse see also (Page 217)			
DBB0002	Skip block selected see also (Page 218)							
	7	6	5	4	3	2	1	0
DBB0003							Skip block selected see also (Page 218)	
							9	8
DBB0004	Reserved							
DBB0005	Reserved							

DB1700 ... DB170x	**Signals from HMI [r/w] HMI → PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB0006	Reserved							
DBB0007	Reset see also (Page 219)				NC stop see also (Page 218)		NC start see also (Page 218)	

Table 10-24 DB1700, program selection

DB1700	**Program selection [r/w] Signals from PLC → HMI**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB1000	Program selection see also (Page 219)							Disable teach transfer
DBB1001	Always 1 see also (Page 219)	Program selection from the PLC: Index of the program list see also (Page 219)						
DBB1002	Program selection from the PLC: Program number within the program list see also (Page 220)							
DBB1003	Reserved							

Table 10-25 DB1700, program selection

DB1700	**Program selection [r] Signals from HMI → PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB2000	Program selection from the PLC: Status signals							
	Selection see also (Page 222)	Load see also (Page 222)	Unload see also (Page 222)		Active see also (Page 221)	Error See also (Page 221)	Job completed see also (Page 221)	
DBB2001	Program selection from the PLC: Error code see also (Page 222)							
DBB2002	Reserved							
DBB2003	Reserved							

10.1.5.1 DB1700, axis selection

Table 10-26 DB1700, axis selection

DB1700	Program selection [r/w] Signals from HMI → PLC							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB4000	Axis selection type see also (Page 223)							
DBB4001	Axis number see also (Page 224)							
DBB4002								Axis selection key see also (Page 224)

Table 10-27 DB1700, axis selection

DB1700	Program selection [r] Signals from PLC → HMI							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB5000	Active axis selection (feedback message to the HMI) see also (Page 224)							
DBB5001	Active axis number (feedback message to the HMI) see also (Page 225)							

Table 10-28 DB1800 ... 180x, signals from HMI

DB1800 ... DB180x	Signals from HMI [r] HMI → PLC							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB0000	Reset see also (Page 226)					Mode		
						JOG see also (Page 226)	MDA see also (Page 226)	AUTOMATIC see also (Page 225)
DBB0001					Active machine function			
						REF see also (Page 227)		TEACH IN see also (Page 226)
DBB0002	Reserved							
DBB0003	Reserved							

Table 10-29 DB1800, signals from the PLC

DB1800	**Signals from the PLC [r]**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB1000		Commissioning archive was read in  see also (Page 227)					Run-up with saved data  see also (Page 227)	Run-up with default values  see also (Page 227)
DBB1001	Reserved							
DBB1002	Reserved							
DBB1003	Reserved							
DBD1004	PLC cycle time in µs [DINT]							
DBB1008	Year: Tens digit, BCD				Year: Units digit, BCD			
DBB1009	Month: Tens digit, BCD				Month: Units digit, BCD			
DBB1010	Day: Tens digit, BCD				Day: Units digit, BCD			
DBB1011	Hour: Tens digit, BCD				Hour: Units digit, BCD			
DBB1012	Minute: Tens digit, BCD				Minute: Units digit, BCD			
DBB1013	Second: Tens digit, BCD				Second: Units digit, BCD			
DBB1014	Millisecond: Hundreds digit, BCD				Millisecond: Tens digit, BCD			
DBB1015	Millisecond: Units digit, BCD				Weekday, BCD {1, 2, ... 7} (1 = Sunday)			
DBW1016	Configured number of mode groups							
DBW1018	Maximum channel number							
DBW1020	Maximum axis number							
DBB1022	Current channel distribution							
							Channel 2	Channel 1
DBB1023	Reserved							
DBB1024	Current axis distribution							
	Axis 8	Axis 7	Axis 6	Axis 5	Axis 4	Axis 3	Axis 2	Axis 1
DBB1025	Current axis distribution							
					Axis 12	Axis 11	Axis 10	Axis 9
DBW1026	Reserved							

Table 10-30 DB1800, signals to the maintenance planner

DB1800	**Deactivation [w/r]** **PLC → HMI**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB2000	Deactivation							
	8	7	6	5	4	3	2	1
DBB2001	Deactivation							
	16	15	14	13	12	11	10	9

DB1800	**Deactivation [w/r]** **PLC → HMI**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB2002	Deactivation							
	24	23	22	21	20	19	18	17
DBB2003	Deactivation							
	32	31	30	29	28	27	26	25

Table 10-31 DB1800, signals from the maintenance planner, warnings/alarms

DB1800	**Warnings/Alarms [r]** **HMI → PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB3000	Alarm							
	8	7	6	5	4	3	2	1
DBB3001	Alarm							
	16	15	14	13	12	11	10	9
DBB3002	Alarm							
	24	23	22	21	20	19	18	17
DBB3003	Alarm							
	32	31	30	29	28	27	26	25

Table 10-32 DB1800, signals to the maintenance planner

DB1800	**Acknowledgements [w/r]** **HMI → PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB4000	Acknowledgements							
	8	7	6	5	4	3	2	1
DBB4001	Acknowledgements							
	16	15	14	13	12	11	10	9
DBB4002	Acknowledgements							
	24	23	22	21	20	19	18	17
DBB4003	Acknowledgements							
	32	31	30	29	28	27	26	25

Table 10-33 DB1800, signals to the maintenance planner

DB1800	**Acknowledgement locks [w/r]**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB5000	Acknowledgement locks							
	8	7	6	5	4	3	2	1
DBB5001	Acknowledgement locks							
	16	15	14	13	12	11	10	9

DB1800	**Acknowledgement locks [w/r]**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB5002	Acknowledgement locks							
	24	23	22	21	20	19	18	17
	Acknowledgement locks							
DBB5003	32	31	30	29	28	27	26	25

Table 10-34 DB1900, signals from the operator panel

DB1900	**Signals from operator panel [r]** **Signal from HMI → PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB0000	Switch over MCS/WCS see also (Page 228)	Simulation active see also (Page 228)				Cancel see also (Page 228)		
DBB0001	Current screen number							
DBB0002	Displayed channel number from HMI							
DBB0003					Proximity sensor active see also (Page 229)	Screen change active	Data transfer active	Keyboard has been used
DBW0004	The current screen number is displayed see also (Page 229)							
DBB0006	Reserved							
DBB0007	Reserved							
DBB0008	Reserved							
DBB0010	Reserved							
DBB0011 DBB0012 DBB0013 DBB0014 DBB0015	Fault detection see also (Page 229) Function selection from DB1900 DBB5021 (Page 152)							
DBB0016	Reserved							
DBB0017	Reserved							
DBB0018	Reserved							
DBB0019	Reserved							
DBW0020	Simulation state							

Table 10-35 DB1900, sidescreen - interface for the MCP function

DB1900	**Signals from operator panel [r]** **Signal from HMI → PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB0022	Customer keys							
	8	7	6	5	4	3	2	1
DBB0023	Customer keys							
	16	15	14	13	12	11	10	9
DBB0024	Customer keys							
	24	23	22	21	20	19	18	17
DBB0025	Customer keys							
	32	30	30	29	28	27	26	25
DBB0026	Customer keys							
	40	39	38	37	36	35	34	33
DBB0027	Customer keys							
	48	47	46	45	44	43	42	41
DBB0028	Customer keys							
	56	55	54	53	52	51	50	49
DBB0029	Customer keys							
	64	63	62	61	60	59	58	57
DBB0030	Reserved							
DBB0031	Reserved							

Table 10-36 DB1900, signals from HMI

DB1900	**Signals from HMI [r]** **Signal from HMI → PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB1000					Channel number for handwheel 1 see also (Page 230)			
					D	C	B	A
DBB1001					Channel number for handwheel 2 see also (Page 230)			
					D	C	B	A
DBB1002					Channel number for handwheel 3 see also (Page 230)			
					D	C	B	A

DB1900	**Signals from HMI [r]** **Signal from HMI → PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB1003	Handwheel 1				Axis number for handwheel 1 see also (Page 231)			
	Machine axis see also (Page 232)	Handwheel selected see also (Page 232)	Defined as contour handwheel see also (Page 231)		D	C	B	A
DBB1004	Handwheel 2				Axis number for handwheel 2 see also (Page 231)			
	Machine axis see also (Page 232)	Handwheel selected see also (Page 232)	Defined as contour handwheel see also (Page 231)		D	C	B	A
DBB1005	Handwheel 3				Axis number for handwheel 3 see also (Page 231)			
	Machine axis see also (Page 232)	Handwheel selected see also (Page 232)	Defined as contour handwheel see also (Page 231)		D	C	B	A
DBB1006	Reserved							
DBB1007	Set language ID from HMI **More information:** Commissioning Manual SINUMERIK 828D SINUMERIK Operate							
DBB1008	Collision avoidance: Deactivate protection area group see also (Page 230)							
	For operating mode: JOG				For operating mode: AUTOMATIC			
	Workpieces	Workholder	Tools	Machine	Workpieces	Workholder	Tools	Machine

10.1.5.2 DB1900, signals from/to HMI

Table 10-37 DB1900, interface HMI <-> PLC

DB1900	**Tool Ident Connection** **Transfer parameters**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBW 3000	Subtype of the tool (INT)							
DBW 3002	Duplo number (INT)							
DBB 3004	Maximum length of the tool identifier							
DBB 3005	Current length of the tool identifier							
DBB 3006	Tool identifier 1							
...	...							

DB1900	**Tool Ident Connection** **Transfer parameters**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB 3037	Tool identifier 32							
DBW 3038	T number (INT)							
DBW 3040	Magazine location number (INT)							
DBW 3042	Magazine location type (INT)							
DBB 3044	Tool size top in half locations							
DBB 3045	Tool size bottom in half locations							
DBB 3046	Tool size left in half locations							
DBB 3047	Tool size right in half locations							
DBB 3048	Channel number							
DBB 3049	Number of the loading/unloading location							
DBW 3050	Magazine number							
DBB 3052	Number of data storage medium							
DBB 3053	Number of data storage medium							
DBB 3052	Name of the NCU							
DBW 3054	File index (import/export) (INT)							
DBB 3056					Delete tool after unloading	Load tool after being created	Overwrite file	Hide status bit "Tool active"
	Return values							
DBW 3058	Subtype of the tool (INT)							
DBW 3060	Duplo number (INT							
DBB 3062	Maximum length of the tool identifier							
DBB 3063	Current length of the tool identifier							
DBB 3064	Tool identifier 1							
...	...							
DBB 3095	Tool identifier 32							
DBW 3096	T number (INT)							
DBW 3098	Tool state (INT)							
DBW 3100	Magazine location type (INT)							
DBB 3102	Tool size top in half locations							
DBB 3103	Tool size bottom in half locations							
DBB 3104	Tool size left in half locations							
DBB 3105	Tool size right in half locations							
DBB 3106	Magazine number (INT)							
DBB 3108	Magazine location number (INT)							
	Function call							
DBB 3110								Request job
DBB 3111	Command code							
DBB 3112	Status for power up					Job is being processed	Job ended with error	Job successfully completed
DBB 3113	Command code in case of error							

DB1900	**Tool Ident Connection** **Transfer parameters**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB 3114	Error code							
	Interface for the Parameter operating area							
DBB 3116								Request job
DBB 3117								
DBB 3118						Job is being processed	Job ended with error	Job successfully completed
DBB 3119					Selective writing	Read/write canceled	Write tool data to CT	Read tool data from CT
DBW 3120	Error code of the PLC (INT)							
	Transfer parameters							
DBW 3122	Magazine number (INT)							
DBW 3124	Magazine location number (INT)							
DBB 3126	T number (INT)							

Table 10-38 DB1900 / 1901, signals to HMI

DB1900	**Signals to HMI [r/w]** **Signal from PLC → HMI**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB5000	Actual value in the WCS 0=MCS see also (Page 234)	Save to action log see also (Page 234)				Key lock see also (Page 234)	Screen dark see also (Page 233)	
DBB5001							External viewers can only monitor	Do not permit external viewers
DBB5002	Reserved							
DBB5003	PLC hard keys (value range 1 .. 255, 0 is the initial state) **More information:** Commissioning Manual SINUMERIK 828D SINUMERIK Operate							
DBB5004								
DBB5005								
DBB5006	Analog spindle 1, utilization in percent							
DBB5007								
DBB5008								
DBB5009						HT10 handwheel active see also (Page 235)		
						Handwheel 3	Handwheel 2	Handwheel 2

DB1900	**Signals to HMI [r/w]** **Signal from PLC → HMI**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBW5010								
DBB5012								
DBB5013								
DBB5014								
DBB5015								
DBB5016								
DBB5017								
DBB5018								
DBB5019								
DBB5020								
DBB5021	Busy function	Strobe function	Function selection number from PLC					
DBB5022	Parameter 1 for function selection number, Function selection from DB1900.DBB5021 see also (Page 235)							
DBB5023	Parameter 2 for function selection number, Function selection from DB1900.DBB5021 see also (Page 235)							
DBB5024	Parameter 3 for function selection number, Function selection from DB1900.DBB5021 see also (Page 235)							

Table 10-39 DB1900 / 1901, sidescreen - interface for the MCP function

DB1900	**Signals to HMI [r/w]** **Signal from PLC → HMI**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB5026	Customer LED							
	8	7	6	5	4	3	2	1
DBB5027	Customer LED							
	16	15	14	13	12	11	10	9
DBB5028	Customer LED							
	24	23	22	21	20	19	18	17
DBB5029	Customer LED							
	32	31	30	29	28	27	26	25
DBB5030	Customer LED							
	40	39	38	37	36	35	34	33
DBB5031	Customer LED							
	48	47	46	45	44	43	42	41
DBB5032	Customer LED							
	56	55	54	53	52	51	50	49

DB1900	**Signals to HMI [r/w]** **Signal from PLC → HMI**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB5033	Customer LED							
	64	63	62	61	60	59	58	57
DBB5034	Customer keys deactivated							
	8	7	6	5	4	3	2	1
DBB5035	Customer keys deactivated							
	16	15	14	13	12	11	10	9
DBB5036	Customer keys deactivated							
	24	23	22	21	20	19	18	17
DBB5037	Customer keys deactivated							
	32	31	30	29	28	27	26	25
DBB5038	Customer keys deactivated							
	40	39	38	37	36	35	34	33
DBB5039	Customer keys deactivated							
	48	47	46	45	44	43	42	41
DBB5040	Customer keys deactivated							
	56	55	54	53	52	51	50	49
DBB5041	Customer keys deactivated							
	64	63	62	61	60	59	58	57
DBB5042	Reserved							
DBB5043	Reserved							

10.1.6 Auxiliary function transfer from the channel

Table 10-40 DB2500 / 250x, auxiliary function transfer from the channel

DB2500 ... DB250x	**Auxiliary functions from the channel [r]** **Signals from NC → PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB0000	Reserved							
DBB0001	Reserved							
DBB0002	Reserved							
DBB0003	Reserved							
DBB0004				M function change see also (Page 236)				
				5	4	3	2	1
DBB0005	Reserved							

DB2500 ... DB250x	**Auxiliary functions from the channel [r] Signals from NC → PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB0006								S function 1 change see also (Page 236)
DBB0007	Reserved							
DBB0008								T function 1 change see also (Page 236)
DBB0009	Reserved							
DBB0010								D function 1 change see also (Page 236)
DBB0011	Reserved							
DBB0012						H function change see also (Page 236)		
						3	2	1
DBB0013	Reserved							
...	...							
DBB0019	Reserved							

Table 10-41 DB2500 / 250x, M functions from the channel

DB2500 ... DB250x	**M functions from the channel [r] Signals from NC → PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB1000	Dynamic M functions see also (Page 236)							
	M07	M06	M05	M04	M03	M02	M01	M00
DBB1001	Dynamic M functions see also (Page 236)							
	M15	M14	M13	M12	M11	M10	M09	M08
DBB1002	Dynamic M functions see also (Page 236)							
	M23	M22	M21	M20	M19	M18	M17	M16
...	...							

DB2500 ... DB250x	**M functions from the channel [r] Signals from NC → PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB1012					Dynamic M functions see also (Page 236)			
					M99	M98	M97	M96
DBB1013								
DBB1014								
DBB1015								
DBB1012								
DBB1013								
DBB1014								
DBB1015								

PLC users must generate static M functions themselves from the dynamic M functions.

Dynamic M functions are decoded by the PLC user program (M00 to M99).

Note

The signals are output for the duration of a PLC cycle.

Table 10-42 DB2500 / 250x, T functions from the channel

DB2500 ... DB250x	**T functions from the channel [r] Signal from the NC → PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBD2000	T function 1 (DINT) see also (Page 237)							
DBB2004	Extended address T function 1 (byte) see also (Page 237)							
DBB2005								
DBB2006								
DBB2007								

Table 10-43 DB2500 / 250x, M functions from the channel

DB2500 ... DB250x	**M functions from the channel [r] Signal from the NC → PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBD3000	M function 1 (DINT) see also (Page 237)							
DBW3004	Extended address, M function 1 (16-bit INT) see also (Page 237)							
DBD3008	M function 2 (DINT) see also (Page 237)							

DB2500 ... DB250x	**M functions from the channel [r] Signal from the NC → PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBW3012	Extended address, M function 2 (16-bit INT) see also (Page 237)							
DBD3016	M function 3 (DINT) see also (Page 237)							
DBW3020	Extended address, M function 3 (16-bit INT) see also (Page 237)							
DBD3024	M function 4 (DINT) see also (Page 237)							
DBB3028	Extended address, M function 4 (16-bit INT) see also (Page 237)							
DBD3032	M function 5 (DINT) see also (Page 237)							
DBW3036	Extended address, M function 5 (16-bit INT) see also (Page 237)							

Table 10-44 DB2500 / 250x, S functions from the channel

DB2500 ... DB250x	**S functions from the channel [r] Signal from the NC → PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBD4000	S function 1 (REAL) see also (Page 238)							
DBW4004	Extended address, S function 1 (16-bit INT) see also (Page 238)							
DBD4008	S function 2 (REAL) see also (Page 238)							
DBW4012	Extended address, S function 2 (16-bit INT) see also (Page 238)							
DBD4016	S function 3 (REAL) see also (Page 238)							
DBW4020	Extended address, S function 3 (16-bit INT) see also (Page 238)							

Table 10-45 DB2500 / 250x, D functions from the channel

DB2500 ... DB250x	**D functions from the channel [r] Signal from the NC → PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBD5000	D function 1 (DINT) see also (Page 238)							
DBW5004								

Table 10-46 DB2500 / 250x, H functions from the channel

DB2500 ... DB250x	**H functions from the channel [r] Signal from the NC → PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBD6000	H function 1 (REAL or DINT) see also (Page 239)							
DBW6004	Extended address, H function 1 (16-bit INT) see also (Page 239)							
DBD6008	H function 2 (REAL or DINT) see also (Page 239)							
DBW6012	Extended address, H function 2 (16-bit INT) see also (Page 239)							
DBD6016	H function 3 (REAL or DINT) see also (Page 239)							
DBW6020	Extended address, H function 3 (16-bit INT) see also (Page 239)							

10.1.7 NC signals

Table 10-47 DB2600, general signals to the NC

DB2600	**General signals to the NC [r/w] Signals from PLC → NC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB0000	Protection level: Key-operated switch position 0 to 3 see also (Page 241)					Acknowledge emergency stop see also (Page 240)	Emergency stop see also (Page 239)	Braking on the contour with emergency stop
	4	5	6	7				
DBB0001		Request switch-on of reduced dynamic response mode see also (Page 242)				Request, axis distances-to-go	Request, axis actual values	INC inputs in the mode signal range active see also (Page 241)
DBB0002	Collision avoidance: Deactivate protection area group see also (Page 242)							
	For operating mode: JOG				For operating mode: AUTOMATIC			
	Workpieces	Workholder	Tools	Machine	Workpieces	Workholder	Tools	Machine
DBB0003								

DB2600	**General signals to the NC [r/w]** **Signals from PLC → NC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB0004	Collision avoidance: Activate protection area (bit) see also (Page 243)							
	7	6	5	4	3	2	1	0
DBB0005	Collision avoidance: Activate protection area (bit) see also (Page 243)							
	15	14	13	12	11	10	9	8
DBB0006	Collision avoidance: Activate protection area (bit) see also (Page 243)							
	23	22	21	20	19	18	17	16
DBB0007	Collision avoidance: Activate protection area (bit) see also (Page 243)							
	31	30	29	28	27	26	25	24
DBB0008	Collision avoidance: Activate protection area (bit) see also (Page 243)							
	39	38	37	36	35	34	33	32
DBB0009	Collision avoidance: Activate protection area (bit) see also (Page 243)							
	47	46	45	44	43	42	41	40
DBB00010	Collision avoidance: Activate protection area (bit) see also (Page 243)							
	55	54	53	52	51	50	49	48
DBB0011	Collision avoidance: Activate protection area (bit) see also (Page 243)							
	63	62	61	60	59	58	57	56

Table 10-48 DB2600, signals from robot

DB2600	**Signals from robot [r/w]** **Signals from PLC → NC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB1000	Robot state byte 0							
DBB1001	Robot state byte 1							
DBB1002	Robot state byte 2							
DBB1003	Robot state byte 3							
DBB1004	Robot state byte 4							
DBB1005	Robot state byte 5							
DBB1006	Robot state byte 6							
DBB1007	Robot state byte 7							

Table 10-49 DB2700, general signals from the NC

DB2700	**General signals from the NC [r]** **Signals from NC → PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB0000							Emergency stop active see also (Page 243)	
DBB0001	System Inch measuring system see also (Page 244)						Probe actuated see also (Page 244) Probe 2	Probe 1
DBB0002	NC ready see also (Page 245)	Drives ready see also (Page 245)	Drives in cyclic operation see also (Page 244)		HMI ready see also (Page 244)			
DBB0003		Air temperature alarm see also (Page 246)						NC alarm is present see also (Page 245)
DBB0004								
DBB0005								
DBB0006								
DBB0007								
DBB0008								
DBB0009								
DBB0010								
DBB0011								
DBB0012	Change counter for motion, handwheel 1							
DBB0013	Change counter for motion, handwheel 2							
DBB0014	Change counter for motion, handwheel 3							
DBB0015	Change counter, inch/metric measuring system							
DBB0016								
DBB0017								
DBB0018								
DBB0019								
DBB0020	Collision avoidance: Protection area active see also (Page 246)							
	7	6	5	4	3	2	1	0

DB2700	General signals from the NC [r] Signals from NC → PLC							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB0021	Collision avoidance: Protection area active  see also (Page 246)							
	15	14	13	12	11	10	9	8
DBB0022	Collision avoidance: Protection area active  see also (Page 246)							
	23	22	21	20	19	18	17	16
DBB0023	Collision avoidance: Protection area active  see also (Page 246)							
	31	30	29	28	27	26	25	24
DBB0024	Collision avoidance: Protection area active  see also (Page 246)							
	39	38	37	36	35	34	33	32
DBB0025	Collision avoidance: Protection area active  see also (Page 246)							
	47	46	45	44	43	42	41	40
DBB0026	Collision avoidance: Protection area active  see also (Page 246)							
	55	54	53	52	51	50	49	48
DBB0027	Collision avoidance: Protection area active  see also (Page 246)							
	63	62	61	60	59	58	57	56

Table 10-50 DB2700, signals from the robot

DB2700	Signals from robot [r/w] Signals from NC → PLC							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB1000	Robot state byte 0							
DBB1001	Robot state byte 1							
DBB1002	Robot state byte 2							
DBB1003	Robot state byte 3							
DBB1004	Robot state byte 4							
DBB1005	Robot state byte 5							
DBB1006	Robot state byte 6							
DBB1007	Robot state byte 7							

Table 10-51 Signals to fast inputs and outputs

DB2800	**Signals to fast inputs and outputs [r/w]** **Signals from PLC → NC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB0000	Disable of the digital NC inputs see also (Page 247)							
	Input 8	Input 7	Input 6	Input 5	Input 4	Input 3	Input 2	Input 1
DBB0001	Setting of the digital NC inputs from the PLC see also (Page 247)							
	Input 8	Input 7	Input 6	Input 5	Input 4	Input 3	Input 2	Input 1
DBB0002	Reserved							
DBB0003	Reserved							
DBB0004	Disable of the digital NC outputs see also (Page 248)							
	Output 8	Output 7	Output 6	Output 5	Output 4	Output 3	Output 2	Output 1
DBB0005	Overwrite mask of the digital NC outputs see also (Page 248)							
	Output 8	Output 7	Output 6	Output 5	Output 4	Output 3	Output 2	Output 1
DBB0006	Setting value of the digital NC outputs from the PLC see also (Page 249)							
	Output 8	Output 7	Output 6	Output 5	Output 4	Output 3	Output 2	Output 1
DBB0007	Input mask of the digital NC outputs see also (Page 249)							
	Output 8	Output 7	Output 6	Output 5	Output 4	Output 3	Output 2	Output 1

Table 10-52 Signals to fast inputs and outputs

DB2800	**Signals to fast inputs and outputs [r/w]** **Signals from PLC → NC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB1000	Disable of the external digital NC inputs see also (Page 250)							
	Input 16	Input 15	Input 14	Input 13	Input 12	Input 11	Input 10	Input 9
DBB1001	Setting of the external digital NC inputs from the PLC see also (Page 251)							
	Input 16	Input 15	Input 14	Input 13	Input 12	Input 11	Input 10	Input 9
DBB1002	Reserved							
...	...							
DBB1007	Reserved							
DBB1008	Disable of the digital NC outputs see also (Page 251)							
	Output 16	Output 15	Output 14	Output 13	Output 12	Output 11	Output 10	Output 9

DB2800	**Signals to fast inputs and outputs [r/w]** **Signals from PLC → NC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB1009	Overwrite mask of the digital NC outputs see also (Page 252)							
	Output 16	Output 15	Output 14	Output 13	Output 12	Output 11	Output 10	Output 9
DBB1010	Setting value of the digital NC outputs from the PLC see also (Page 252)							
	Output 16	Output 15	Output 14	Output 13	Output 12	Output 11	Output 10	Output 9
DBB1011	Input mask of the digital NC outputs see also (Page 253)							
	Output 16	Output 15	Output 14	Output 13	Output 12	Output 11	Output 10	Output 9

Table 10-53 Signals from fast inputs and outputs

DB2900	**Signals from fast inputs and outputs [r/w]** **Signals from NC → PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB0000	Actual value of the digital NC inputs see also (Page 254)							
	Input 8	Input 7	Input 6	Input 5	Input 4	Input 3	Input 2	Input 1
DBB0001	Reserved							
DBB0002	Reserved							
DBB0003	Reserved							
DBB0004	Setpoint of digital NC outputs see also (Page 254)							
	Output 8	Output 7	Output 6	Output 5	Output 4	Output 3	Output 2	Output 1

Table 10-54 Signals to fast inputs and outputs

DB2900	**Signals to fast inputs and outputs [r/w]** **Signals from NC → PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB1000	Actual value of the digital NC inputs see also (Page 255)							
	Input 16	Input 15	Input 14	Input 13	Input 12	Input 11	Input 10	Input 9
DBB1001	Reserved							
DBB1002	Reserved							
DBB1003	Reserved							
DBB1004	Setpoint of digital NC outputs see also (Page 255)							
	Output 16	Output 15	Output 14	Output 13	Output 12	Output 11	Output 10	Output 9

Table 10-55 DB3000 / 300x, mode signals to the NC

DB3000 ... DB300x	**Mode signals to the NC [r/w] Signals from PLC → NC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB0000	Mode group reset[1] see also (Page 257)	Mode group stop axes plus spindle[1]	Mode group stop[1]	Mode change disable see also (Page 256)		Mode		
						JOG see also (Page 256)	MDA see also (Page 256)	AUTOMATIC see also (Page 256)
DBB0001	Single block					Machine function		
	Type A see also (Page 258)	Type B see also (Page 258)				REF see also (Page 257)		TEACH IN see also (Page 257)
DBB0002		Machine function To use the machine function signals in the DB, signal DB2600.DBX0001.0 (Page 158) must be set to "1". see also (Page 259)						
		Continuous travel	INCvar	INC10000	INC1000	INC100	INC10	INC1
DBB0003	Reserved							

[1] Signals only available/valid with multi-channel configuration

Table 10-56 DB3100 / 310x, mode signals from the NC

DB3100 ... DB310x	**Mode signals from the NC [r] Signals from NC → PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB0000	All channels in the reset state[1] see also (Page 259)			Mode group reset executed[1]	Mode group ready see also (Page 260)	Active operating mode		
						JOG see also (Page 260)	MDA see also (Page 260)	AUTOMATIC see also (Page 259)
DBB0001						Active machine function		
						REF see also (Page 261)		TEACH IN see also (Page 261)
DBB0002		Active machine function						
		Continuous travel	INCvar	INC10000	INC1000	INC100	INC10	INC1
DBB0003	Reserved							

[1] Signals only available/valid with multi-channel configuration

10.1.8 Channel-specific signals

10.1.8.1 Signals to NC channel (DB 3200...320x)

Table 10-57 DB3200 / 320x, control signals to NC channel

DB3200 ... DB320x	Control signals to NC channel [r/w] Signals from PLC → NC							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB0000		Activate dry run feedrate see also (Page 263)	Activate M01 see also (Page 263)	Activate single block[1] see also (Page 263)	Activate DRF see also (Page 262)	Activate travel forward see also (Page 262)	Activate travel backward see also (Page 261)	
DBB0001	Activate program test see also (Page 265)	PLC action completed see also (Page 265)				Synchronous action off see also (Page 265)	Enable protection areas see also (Page 264)	Activate referencing see also (Page 264)
DBB0002	Activate skip block see also (Page 266)							
	7	6	5	4	3	2	1	0
DBB0003	Reserved							
DBB0004	Feedrate override[2] see also (Page 267)							
	H	G	F	E	D	C	B	A
DBB0005	Rapid traverse override[2] see also (Page 268)							
	H	G	F	E	D	C	B	A
DBB0006	Feedrate override active[3] see also (Page 272)	Rapid traverse override active see also (Page 271)		Program level abort see also (Page 271)	Delete UP number of passes	Delete distance-to-go see also (Page 271)	Read-in disable see also (Page 269)	Feedrate disable see also (Page 269)
DBB0007	Reset see also (Page 276)	Configured stop function activation see also (Page 275)	Suppress start lock	NC stop axes plus spindle see also (Page 274)	NC stop see also (Page 273)	NC stop at block limit see also (Page 273)	NC start see also (Page 273)	NC start disable see also (Page 272)
DBB0008	Activate machine-related protection area see also (Page 276)							
	Area 8	Area 7	Area 6	Area 5	Area 4	Area 3	Area 2	Area 1

DB3200 ... DB320x	**Control signals to NC channel [r/w] Signals from PLC → NC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB0009							Activate machine-related protection area see also (Page 276)	
							Area 10	Area 9
DBB0010	Activate channel-specific protection area see also (Page 277)							
	Area 8	Area 7	Area 6	Area 5	Area 4	Area 3	Area 2	Area 1
DBB0011							Activate channel-specific protection area see also (Page 277)	
							Area 10	Area 9
DBB0012	Reserved							
DBB0013	Do not disable tool see also (Page 279)		Deactivate workpiece counter see also (Page 278)		Activate fixed feedrate see also (Page 278)			
					Feedrate 4	Feedrate 3	Feedrate 2	Feedrate 1
DBB0014	No tool change commands	Jog circles see also (Page 280)	Associated Activate M01 see also (Page 280)	Neg. direction for sim. Contour handwheel see also (Page 280)	Sim. contour handwheel on	Activate contour handwheel (bit/binary-coded) see also (Page 279)		
						Handwheel 3	Handwheel 2	Handwheel 1
DBB0015	Activate skip block see also (Page 281)		Invert contour handwheel direction of rotation see also (Page 281)					
	9	8						
DBB0016								Control program branching (GOTOS) see also (Page 282)
DBB0017	Value from PLC for NC grinding inputs $AC_IN_KEY_G[1...8] see also (Page 282)							
DBB0018	Blocking the digital NC grinding inputs from the PLC see also (Page 282)							

DB3200 ... DB320x	**Control signals to NC channel [r/w] Signals from PLC → NC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB0019	Status of the digital NC grinding outputs from the PLC $AC_IN_KEY_G_RUN_IN[1...8] see also (Page 283)							

1) Single block type preselection (SBL1/SBL2) using the softkey.

2) 31 positions (Gray code).

3) Even if the feed override is not active (= 100%), the 0% position is still effective.

Table 10-58 DB3200 ... 32xx, control signals to axes in WCS

DB3200 ... DB32xx	**Control signals to axes in WCS [r/w] Signals from PLC → NC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB1000	Geometry axis 1							
	Traversing keys see also (Page 286)		Rapid traverse override see also (Page 285)	Traversing key disable see also (Page 284)	Feedrate stop see also (Page 284)	Activate handwheel[1] (bit/binary-coded) see also (Page 283)		
	plus	minus				3	2	1
DBB1001	Geometry axis 1							
		Machine function To use the machine function signals in the DB, signal DB2600.DBX0001.0 (Page 241) must be set to "1". see also (Page 287)						
		Continuous travel active	INCvar	INC10000	INC1000	INC100	INC10	INC1
DBB1002	Reserved							
DBB1003								Invert handwheel direction of rotation see also (Page 287)
DBB1004	Geometry axis 2							
	Traversing keys see also (Page 286)		Rapid traverse override see also (Page 285)	Traversing key disable see also (Page 284)	Feedrate stop see also (Page 284)	Activate handwheel[1] (bit/binary-coded) see also (Page 283)		
	plus	minus				3	2	1

DB3200 ... DB32xx	**Control signals to axes in WCS [r/w]** **Signals from PLC → NC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB1005	Geometry axis 2							
		Machine function To use the machine function signals in the DB, signal DB2600.DBX0001.0 (Page 158) must be set to "1". see also (Page 287)						
		Continuous travel active	INCvar	INC10000	INC1000	INC100	INC10	INC1
DBB1006	Reserved							
DBB1007								Invert handwheel direction of rotation see also (Page 288)
DBB1008	Geometry axis 3							
	Traversing keys see also (Page 286)		Rapid traverse override see also (Page 285)	Traversing key disable see also (Page 284)	Feedrate stop see also (Page 284)	Activate handwheel[1)] (bit/binary-coded) see also (Page 283)		
	plus	minus				3	2	1
DBB1009	Geometry axis 3							
		Machine function To use the machine function signals in the DB, signal DB2600.DBX0001.0 (Page 241) must be set to "1". see also (Page 287)						
		Continuous travel active	INCvar	INC10000	INC1000	INC100	INC10	INC1
DBB1010	Reserved							
DBB1011								Invert handwheel direction of rotation see also (Page 288)

[1)] The handwheel number is represented according to the MD11324 $MN_HANDWH_VDI_REPRESENTATION machine data, bit-coded (=0) or binary-coded (=1).

10.1.8.2 Signals from NC channel (DB 3300...330x)

Table 10-59 DB3300 ... 330x, status signals from NC channel

DB3300 ... DB330x	**Signals from NC channel [r] Status signals from NC → PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB0000		Last action block active see also (Page 292)	M0 / M1 active see also (Page 291)	Approach block active see also (Page 290)	Action block active see also (Page 290)	Forward travel active see also (Page 290)	Backward travel active see also (Page 289)	Execution from external active
DBB0001	Program test active see also (Page 294)	Transformation active see also (Page 294)	M2/M30 active see also (Page 293)	Block search active see also (Page 293)	Handwheel override active see also (Page 293)	Revolutional feedrate active see also (Page 292)		Referencing active see also (Page 292)
DBB0002	Reserved							
DBB0003	Channel status			Program status				
	Reset see also (Page 297)	Interrupted see also (Page 297)	Active see also (Page 297)	Canceled see also (Page 296)	Interrupted see also (Page 296)	Stopped see also (Page 296)	Waiting see also (Page 295)	Running see also (Page 295)
DBB0004	NC alarm with processing stop is present see also (Page 299)	Channel-specific NC alarm active see also (Page 299)	Channel ready see also (Page 298)		All axes stationary see also (Page 298)	All axes that have to be referenced are referenced see also (Page 298)	Stop request see also	Start request see also
DBB0005						Contour handwheel active (bit/binary-coded) see also (Page 299)		
						Handwheel 3	Handwheel 2	Handwheel 1
DBB0006	Reserved							
DBB0007	Stop at block end due to configured stop see also (Page 301)	Configured stop function is activated see also (Page 301)	Contour handwheel direction of rotation inverted see also (Page 301)	Stop at block end due to single block see also (Page 301)	Reduced dynamics mode is active see also (Page 300)		NC alarm with program stop see also (Page 300)	Protection areas not guaranteed
DBB0008	Machine-related protection zone preactivated see also (Page 302)							
	Area 8	Area 7	Area 6	Area 5	Area 4	Area 3	Area 2	Area 1

DB3300 ... DB330x	**Signals from NC channel [r] Status signals from NC → PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB0009							Machine-related protection zone preactivated see also (Page 302)	
							Area 10	Area 9
DBB0010	Channel-specific protection area preactivated see also (Page 302)							
	Area 8	Area 7	Area 6	Area 5	Area 4	Area 3	Area 2	Area 1
DBB0011							Channel-specific protection area preactivated see also (Page 302)	
							Area 10	Area 9
DBB0012	Machine-related protection zone violated see also (Page 303)							
	Area 8	Area 7	Area 6	Area 5	Area 4	Area 3	Area 2	Area 1
DBB0013							Machine-related protection zone violated see also (Page 303)	
							Area 10	Area 9
DBB0014	Channel-specific protection zone violated see also (Page 303)							
	Area 8	Area 7	Area 6	Area 5	Area 4	Area 3	Area 2	Area 1
DBB0015							Channel-specific protection zone violated see also (Page 303)	
							Area 10	Area 9

Table 10-60 DB3300 ... 33xx, status signals to axes in WCS

DB3300 ... DB33xx	**Signals to axes in WCS [r] Signals to NC → PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB1000	Geometry axis 1							
	Travel command see also (Page 305)		Travel request see also (Page 304)			Handwheel active[1)] see also (Page 304)		
	plus	minus	plus	minus		3	2	1
DBB1001	Geometry axis 1							
		Active machine function To use the machine function signals in the DB, signal DB2600,DBX0001.0 (Page 158) must be set to "1". see also (Page 305)						
		Continuous travel active	INCvar	INC10000	INC1000	INC100	INC10	INC1
DBB1002	Reserved							

DB3300 ... DB33xx	**Signals to axes in WCS [r] Signals to NC → PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB1003								Invert handwheel direction of rotation see also (Page 306)
DBB1004	Geometry axis 2							
	Travel command see also (Page 305)		Travel request see also (Page 304)			Handwheel active[1)] see also (Page 304)		
	plus	minus	plus	minus		3	2	1
DBB1005	Geometry axis 2							
		Active machine function To use the machine function signals in the DB, signal DB2600.DBX0001.0 (Page 158) must be set to "1". see also (Page 305)						
		Continuous travel active	INCvar	INC10000	INC1000	INC100	INC10	INC1
DBB1006	Reserved							
DBB1007								Invert handwheel direction of rotation see also (Page 306)
DBB1008	Geometry axis 3							
	Travel command see also (Page 305)		Travel request see also (Page 304)			Handwheel active[1)] see also (Page 304)		
	plus	minus	plus	minus		3	2	1
DBB1009	Geometry axis 3							
		Active machine function To use the machine function signals in the DB, signal DB2600.DBX0001.0 (Page 158) must be set to "1". see also (Page 305)						
		Continuous travel active	INCvar	INC10000	INC1000	INC100	INC10	INC1
DBB1010	Reserved							
DBB1011								Invert handwheel direction of rotation see also (Page 307)

[1] The handwheel number is represented according to the MD11324 $MN_HANDWH_VDI_REPRESENTATION machine data, bit-coded (=0) or binary-coded (=1)

Table 10-61 DB3300 ... 33xx, further status signals from NC channel

DB3300 ... DB33xx	**Further status signals from NC channel [r/w] Signals from NC → PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB4000								G00 active
DBB4001			Drive test travel request present				Workpiece setpoint reached  see also (Page 307)	External language mode active
DBB4002		Dry run feedrate active  see also (Page 308)	Associated M01/M00 active  see also (Page 308)	Stop delay				ASUB is stopped  see also (Page 307)
DBB4003	No tool change commands active	Delay area not accepted		Delay				
DBB4004	Display of the triggering event for an event-driven program call  see also (Page 308)							
				Start after block search	Power up	Operator panel reset	Part program end	Part program start from reset
DBB4005		Jog circle active  see also (Page 310)	Retract data available  see also (Page 310)	JOG retract active  see also (Page 309)			Stop condition	Collision avoidance: Stop  see also (Page 309)
DBB4006							ASUB with suppressed display update is active  see also (Page 310)	ASUB is active see also  see also (Page 310)
DBB4007	Reserved							
DBB4008	Index number of the active transformation in the channel see also (Page 311)							
DBB4009	Reserved							

DB3300 ... DB33xx	**Further status signals from NC channel [r/w] Signals from NC → PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB4010	Status of the enable of the digital NC grinding inputs to the PLC $AC_IN_KEY_G_ISENABLE[1...8] **More information:** Parameter Manual for SINUMERIK 828D system variables see also (Page 311)							
DBB4011	Status of the function of the digital NC grinding inputs to the PLC $AC_IN_KEY_G_RUN_OUT[1...8] **More information:** Parameter Manual for SINUMERIK 828D system variables see also (Page 312)							

See also

DB3300.DBB4008, index number of the active transformation (Page 311)

10.1.8.3 DB3400 ... 340x, ASUB: Job [r/w]

Table 10-62 DB3400 / 340x, asynchronous subprograms (ASUB): Job

DB3400 ... DB340x	**ASUB: Job [r/w] Signals from PLC → NC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB0000								INT1 start
DBB0001								INT2 start
DBB0002								INT3 start
DBB0003								INT4 start
DBB0004								INT5 start
DBB0005								INT6 start
DBB0006								INT7 start
DBB0007								INT8 start

Table 10-63 DB3400 / 340x, asynchronous subprograms (ASUB): Result

DB3400 ... DB340x	**ASUB: Result [r] Signals from PLC → NC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB1000	INT1							
					ASUB execution not possible	Interrupt number not assigned	ASUB is being executed	ASUB completed

DB3400 ... DB340x	**ASUB: Result [r] Signals from PLC → NC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB1001	INT2							
					ASUB execution not possible	Interrupt number not assigned	ASUB is being executed	ASUB completed
DBB1002	INT3							
					ASUB execution not possible	Interrupt number not assigned	ASUB is being executed	ASUB completed
DBB1003	INT4							
					ASUB execution not possible	Interrupt number not assigned	ASUB is being executed	ASUB completed
DBB1004	INT5							
					ASUB execution not possible	Interrupt number not assigned	ASUB is being executed	ASUB completed
DBB1005	INT6							
					ASUB execution not possible	Interrupt number not assigned	ASUB is being executed	ASUB completed
DBB1006	INT7							
					ASUB execution not possible	Interrupt number not assigned	ASUB is being executed	ASUB completed
DBB1007	INT8							
					ASUB execution not possible	Interrupt number not assigned	ASUB is being executed	ASUB completed

Table 10-64 DB3500 / 350x, G functions from the channel

DB3500 ... DB350x	**G functions from the channel [r] Signals from NC → PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB000	Active G function of group 1 (8-bit INT) see also (Page 312)							
DBB001	Active G function of group 2 (8-bit INT) see also (Page 312)							

DB3500 ... DB350x	**G functions from the channel [r] Signals from NC → PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB002	Active G function of group 3 (8-bit INT) see also (Page 312)							
...								
DBB062	Active G function of group 63 (8-bit INT) see also (Page 312)							
DBB063	Active G function of group 64 (8-bit INT) see also (Page 312)							

10.1.9 Axis/spindlespecific signals

Table 10-65 DB3700 ... 37xx, transferred M, S functions [r]

DB3700 ... DB37xx	**M, S functions [r] Signals from NC → PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB0000	M function for spindle (DINT) see also (Page 313)							
DBB0004	S function for spindle (REAL) see also (Page 314)							

Table 10-66 DB3700 ... 37xx, signals from HMI [r]

DB3700 ... DB37xx	**Signals from HMI [r] HMI → PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB1000							Activate program test see also (Page 315)	Suppress program test see also (Page 314)
DBB1001								
DBB1002								
DBB1003								

10.1.9.1 Signals to axis/spindle

Table 10-67 DB3800 ... 38xx, signals to axis/spindle

DB3800 ... DB38xx	**Signals to axis/spindle [r/w]** **Signals from PLC → NC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB0000	Feedrate override/Speed offset see also (Page 316)							
	H	G	F	E	D	C	B	A
DBB0001	Override active see also (Page 321)	Position measuring system see also (Page 320)		Follow-up mode see also (Page 319)	Axis/spindle disable see also (Page 318)	Sensor Fixed stop see also (Page 317)	Acknowledge fixed stop reached see also (Page 317)	Drive test Travel enable see also (Page 317)
		2	1					
DBB0002	Reference point value see also (Page 325)				Clamping in progress see also (Page 325)	Spindle reset/delete distance-to-go see also (Page 324)	Controller enable see also (Page 322)	
	4	3	2	1				
DBB0003	Program test axis/spindle enable	Velocity spindle speed limitation see also (Page 327)	Activate fixed feedrate see also (Page 326)				Enable travel to fixed stop see also (Page 325)	
			Feedrate 4	Feedrate 3	Feedrate 2	Feedrate 1		
DBB0004	Traversing keys see also (Page 330)		Rapid traverse override see also (Page 329)	Traversing key disable see also (Page 328)	Feedrate stop/spindle stop see also (Page 328)	Activate handwheel see also (Page 327)		
	plus	minus				3	2	1
DBB0005		Machine function To use the machine function signals in the DB, the signal in DB2600,DBX0001.0 (Page 158) must be set to "1". see also (Page 330)						
		Continuous travel	INCvar	INC10000	INC1000	INC100	INC10	INC1
DBB0006	Reserved							
DBB0007								Invert handwheel direction of rotation

DB3800 ... DB38xx	**Signals to axis/spindle [r/w]** **Signals from PLC → NC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB0008	Request PLC axis/ spindle see also (Page 331)			Activate signal when this byte is changed see also (Page 331)			Request NC axis/spindle channel	
							B	C
DBB0009						Parameter set, servo		
						C	B	A
DBB0010	Reserved							
DBB0011	Reserved							

Table 10-68 DB3800 ... 38xx, signals to axis

DB3800 ... DB38xx	**Signals to axis [r/w]** **Signals from PLC → NC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB1000	Delayed reference point approach see also (Page 333)			Modulo limit enabled see also (Page 332)	Software limit switch 1 or 2 see also (Page 332)		Hardware limit switch see also (Page 332)	
					plus	minus	plus	minus
DBB1001					JOG to position see also (Page 334)	Activate fixed-point approach in JOG see also (Page 333)		
						Position 2	Position 1	Position 0
DBB1002							Activate program test see also (Page 335)	Suppress program test see also (Page 334)
DBB1003	Reserved							

Table 10-69 DB3800 ... 38xx, signals to spindle

DB3800 ... DB38xx	**Signals to the spindle [r/w]** **Signals from the PLC → NC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB2000	Delete S value see also (Page 337)	No speed monitoring when changing the gear	Resynchronize spindle see also (Page 337)		Gear is changed over see also (Page 336)	Actual gear stage see also (Page 336)		
			2	1		C	B	A
DBB2001		Invert M3/M4 see also (Page 338)		Resynchronize during positioning 1 see also (Page 338)				Feedrate override for spindle valid see also (Page 338)
DBB2002	Set direction of rotation see also (Page 340)		Oscillation speed see also (Page 340)	Oscillation controlled by PLC see also (Page 339)				
	left	right						
DBB2003	Spindle override see also (Page 342)							
	H	G	F	E	D	C	B	A

Table 10-70 DB3800 ... 38xx, signals to PLC axis

DB3800 ... DB38xx	**Signals to PLC axis [r/w]** **Signals from PLC → NC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB3000	Start positioning axis	Start spindle positioning	Start spindle rotation	Start spindle oscillation				
DBB3001			Stop spindle rotation	Stop spindle oscillation				
DBB3002	Automatic gear selection	Constant cutting rate	Direction of rotation as for M4		Handwheel override on	Traversing dimension inch	Path condition[1)]	
							Shortest path (DC)	Incremental (IC)
DBB3003	Indexing position						Absolute path condition[1)]	
							Positive direction (ACP)	Negative direction (ACN)

DB3800 ... DB38xx	Signals to PLC axis [r/w] Signals from PLC → NC							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBD3004	Position (REAL, with indexing axis: DINT)							
DBD3008	Feedrate (REAL) If < 0, the value is taken from MD32060 $MA_POS_AX_VELO							

[1] Only one of the IC, DC, ACP, ACN signals may be active at any one time - or none. If no signal is set, then AC is active (Absolute Coordinate).

Table 10-71 DB3800 ... 38xx, signals to drive

DB3800 ... DB3801	Signals to drive [r/w] Signals from PLC → NC							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB4000			Open holding brake					
DBB4001	Pulse enable see also (Page 344)	Integrator disable, speed controller see also (Page 344)	Motor being selected see also (Page 343)	Motor/drive data set: Select (Interface definition: DB3900. /DB3901.DBB4008 (Page 388)) see also (Page 343)				
				Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
DBB4002	Reserved							
DBB4003	Reserved							
DBB4004								
DBB4005							Motor overtemperature: disable current reduction	DYNEGMA: Disable power reduction
DBB4006								
DBB4007								

Table 10-72 DB3800 ... 38xx, signals to technology functions

DB3800 ... DB38xx	**Signals to technology functions [r/w] Signals from PLC → NC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB5000	Activate Master/ Slave see also (Page 346)		Take over control of the drive see also (Page 345)	Torque compensation controller on see also (Page 345)			Control axis see also (Page 345)	
DBB5001								Activate dynamic backlash compensation
DBB5002				Enable following axis overlay see also (Page 346)				
DBB5003	Stop				Resume			
	HIAxMove	Corr	DEPBCS	DEPMCS	HIAxMove	Corr	DEPBCS	DEPMCS
DBB5004	PLC-controlled axis see also (Page 351)	Stop along braking ramp see also (Page 350)	Stop at next reversal point see also (Page 349)	Change reversal point see also (Page 349)	Set reversal point see also (Page 349)	Resume see also (Page 348)	Reset see also (Page 347)	Oscillation reversal from external see also (Page 347)
DBB5005			Disable automatic synchronization see also (Page 352)	Start gantry synchronization see also (Page 351)				
DBB5006				Position spindle	Automatic gear stage change	Setpoint direction of rotation		Spindle stop
						left	right	
DBB5007	Reset synchronism correction	Track synchronism	Disable synchronization see also (Page 352)	Re-synchronize following spindle				
DBB5008	Reserved							
DBB5009	Reserved							
DBB5010	Reserved							
DBB5011	Reserved							

10.1.9.2 Signals from axis/spindle

Table 10-73 DB3900 ... 39xx, signals from axis/spindle

DB3900 ... DB39xx	Signals from axis/spindle [r] Signals from NC → PLC							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB0000	Position reached with exact stop		Referenced/synchronized Position measuring system		Encoder limit frequency exceeded see also (Page 353)			Spindle / no axis see also (Page 353)
	fine see also (Page 355)	coarse see also (Page 355)	2 see also (Page 354)	1 see also (Page 354)	2	1		
DBB0001	Current controller active see also (Page 359)	Speed controller active see also (Page 358)	Position controller active see also (Page 358)	Axis/spindle stationary ($n < n_{min}$) see also (Page 357)	Follow-up active see also (Page 357)	Axis ready see also (Page 356)	Axis alarm see also (Page 356)	Drive test traverse request see also (Page 356)
DBB0002		Fixed stop force limited	Fixed stop reached see also (Page 360)	Activate travel to fixed stop see also (Page 360)	Measurement active see also (Page 360)	Revolutional feedrate active see also (Page 359)	Handwheel override active see also (Page 359)	
DBB0003					Axis/spindle disable active see also (Page 361)	Axis stop active see also (Page 361)	PLC-controlled axis see also (Page 361)	Reset executed see also (Page 360)
DBB0004	Travel command see also (Page 363)		Travel request see also (Page 362)			Handwheel active (bit/binary-coded) see also (Page 362)		
	plus	minus	plus	minus		3	2	1
DBB0005		Active machine function 1 see also (Page 364)						
		Continuous travel	INCvar	INC10000	INC1000	INC100	INC10	INC1
DBB0006	Reserved							
DBB0007								Invert handwheel direction of rotation see also (Page 364)

DB3900 ... DB39xx	**Signals from axis/spindle [r]** **Signals from NC → PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB0008	PLC axis/ spindle see also (Page 365)	Neutral axis/spindle see also (Page 365)	Axis exchange possible see also (Page 365)	New type requested from PLC see also (Page 365)			Current assignment of the NC axis/spindle in the channel see also (Page 365)	
							B	A
DBB0009						Parameter set 2 servo see also (Page 366)		
						C	B	A
DBB0010			DRV Safety Integrated active with SIC/SCC					
DBB0011	PLC axis permanently assigned		Restored					
			2 see also (Page 367)	1 see also (Page 366)				

Table 10-74 DB3900 ... 39xx, signals from axis/spindle

DB3900 ... DB39xx	**Signals from axis/spindle [r]** **Signals from NC → PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB1000				Modulo limit enabled see also (Page 367)				
DBB1001	JOG position reached see also (Page 369)	JOG to position active see also (Page 369)	JOG approach fixed point reached see also (Page 368)			JOG approach fixed point active see also (Page 368)		
			Position 2	Position 1	Position 0	Position 2	Position 1	Position 0
DBB1002	Rounding axis in position	Indexing axis in position see also (Page 370)	Positioning axis see also (Page 370)	Path axis see also (Page 370)				Lubrication pulse see also (Page 370)
DBB1003								Collision avoidance: Velocity reduction see also (Page 371)

Table 10-75 DB3900 ... 39xx, signals from spindle

DB3900 ... DB39xx	**Signals from the spindle [r] Signals from the NC → PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB2000					Change gear stage see also (Page 373)	Set gear stage see also (Page 372) C	B	A
DBB2001	Actual direction of rotation clockwise see also (Page 376)	Speed monitoring see also (Page 375)	Spindle in setpoint range see also (Page 375)	Support range limit violated	Geometry monitoring see also (Page 375)	Speed setpoint Increased see also (Page 374)	Limited see also (Page 374)	Speed limit exceeded see also (Page 373)
DBB2002	Active spindle mode Control mode see also (Page 378)	Oscillation mode see also (Page 378)	Positioning mode see also (Page 378)	Synchronous mode see also (Page 377)	Tapping without compensation chuck active see also (Page 377)		GWPS active see also (Page 376)	Constant cutting rate active see also (Page 376)
DBB2003			Spindle actually reached in position see also (Page 379)					Tool with dynamic response limitation see also (Page 378)

Table 10-76 DB3900 ... 39xx, signals from axis

DB3900 ... DB39xx	**Signals from axis [r] Signals from NC → PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB3000	Positioning axes active	Position reached					Error during traversing	Axis cannot be started
DBB3001	Reserved							
DBB3002	Reserved							
DBB3003	Error number							

Table 10-77 DB3900 ... 39xx, signals from drive

DB3900 ... **DB39xx**	**Signals from drive [r]** **Signals from NC → PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB4000			Open holding brake	Drive-autonomous motion active see also (Page 380)			Ramp-function generator disable active see also (Page 379)	
DBB4001	Pulse enable see also (Page 381)	Integrator disable, speed controller see also (Page 381)	Drive ready see also (Page 381)	Motor/drive data set: Display (interface definition: DB3900. / DB3901.DBB4008 (Page 388)) see also (Page 380)				
				Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
DBB4002	Variable signaling function 1 see also (Page 385)	$n_{act} = n_{set}$ see also (Page 385)	$n_{act} < n_x$ see also (Page 384)	$n_{act} < n_{min}$ see also (Page 384)	$M_d < M_{dx}$ see also (Page 384)	Run-up completed see also (Page 384)	Temperature pre-alarm	
							Heat sink see also (Page 383)	Motor see also (Page 382)
DBB4003			Variable signaling function 3 see also (Page 387)	Variable signaling function 2 see also (Page 387)	Generator operation minimum speed fallen below see also (Page 386)			$V_{DC\ link}$ < alarm threshold see also (Page 386)
DBB4004	Reserved							
DBB4005	Reserved							
DBB4006	Reserved							
DBB4007	Reserved							
DBB4008	Motor/drive data set: Formatting is valid			Motor/drive data set: Formatting (interface definition: DB3800. / DB3801.DBB4001 (Page 343), DB3900. / DB3901.DBB4001 (Page 380)) see also (Page 388)				
				Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
DBB4009	Reserved							
DBB4010								Encoder servicing required

DB3900 ... **DB39xx**	**Signals from drive [r]** **Signals from NC → PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB4011	OR operation: condition fulfilled	AND operation: condition fulfilled			Pole position identification with encoder successfully completed	Motor overtemperature Motor temperature model warning pending	Current reduction active	DYNEGMA: Torque limit applied

Table 10-78 DB3900 ... 39xx, signals from technology functions

DB3900 ... **DB39xx**	**Signals from axis/spindle [r]** **Signals from NC → PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB5000	Master/slave on see also (Page 389)		Control over the drive taken over see also (Page 389)	Master/slave Torque compensation controller active see also (Page 389)	Master/slave coarse see also (Page 388)	fine see also (Page 388)		
DBB5001	Reserved							
DBB5002	ESR reaction is triggered see also (Page 392)	Acceleration warning threshold reached see also (Page 392)	Velocity warning threshold reached see also (Page 391)	Overlaid motion see also (Page 391)		Actual value coupling see also (Page 390)	Synchronism coarse see also (Page 390)	fine see also (Page 389)
DBB5003		Max. acceleration reached	Max. velocity reached	Synchronization in progress	Axis accelerated see also (Page 393)	Synchronism correction implemented	Following spindle active see also (Page 393)	Leading spindle active see also (Page 393)
DBB5004	Oscillation active see also (Page 395)	Oscillation motion active see also (Page 395)	Sparking out active see also (Page 395)	Error during oscillation movement see also (Page 394)	Oscillation cannot be started see also (Page 394)	Oscillation reversal is active see also (Page 394)		
DBB5005	Gantry axis	Gantry guide axis	Gantry grouping is synchronized see also (Page 396)	Synchronism ready to start see also (Page 396)	Gantry warning threshold exceeded	Gantry trip limit exceeded		

DB3900 ... DB39xx	**Signals from axis/spindle [r] Signals from NC → PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB5006		Position measuring system activated  see also (Page 397)			Clamping tolerance exceeded			Dynamic backlash compensation active
		2	1					
DBB5007			Synchronous operation 2					Synchronism correction is taken into account
			coarse	fine				
DBB5008	Active infeed axes  see also (Page 398)							
			Axis 6	Axis 5	Axis 4	Axis 3	Axis 2	Axis 1

Table 10-79 DB3900 ... 39xx, signals from the spindle

DB3900 ... DB39xx	**Signals from axis/spindle [r] Signals from NC → PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB7000	Sensor configuration							
		Sensor S6 available	Sensor S5 available (angular position of the motor shaft)  see also (Page 399)	Sensor S4 available (piston end position)  see also (Page 398)			Sensor S1 available (clamped state)  see also (Page 398)	Sensors available  see also (Page 398)
DBB7001	Sensor configuration							
						Status value is generated  see also (Page 399)		
DBW7002	Status of the clamping system (sensor S1)  see also (Page 399)							
DBW7004	Analog measured value of the clamping system (sensor S1)  see also (Page 400)							

DB3900 ... DB39xx	**Signals from axis/spindle [r]** **Signals from NC → PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB7006	Status digital sensors							
			Sensor S5 (angular position of the motor shaft) see also (Page 401)	Sensor S4 (piston end position) see also (Page 400)				
DBB7007								

10.1.10 Tool management

10.1.10.1 Loading, unloading and reloading

Table 10-80 DB4000 ... 40xx, signals to the tool management

DB4000 ... DB40xx	**Acknowledgements for loading, unloading and reloading, positioning the magazine** **Signals to tool management [r/w]**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBBy000	Acknowledgment step							
	7	6	5	4	3	2	1	Total acknowledgment:
DBBy001	Acknowledgment step							
	15	14	13	12	11	10	9	8
DBBy002	Acknowledgment step							
	23	22	21	20	19	18	17	16
DBBy003	Acknowledgment step							
	Reserved	30	29	28	27	26	25	24
DBWy004	Multitool: Location number (INT)							
DBBy006	Reserved							
DBBy007	Reserved							
DBBy008	Reserved							
DBBy009							Job acknowledgment[1)]	Resetting the acknowledgment error
DBBy010	Reserved							
DBBy012	Reserved							

DB4000 ... DB40xx	**Acknowledgements for loading, unloading and reloading, positioning the magazine Signals to tool management [r/w]**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBBy014	Reserved							
DBBy016	Reserved							

xx = loading position

y [= 0 or 1]: TO unit 1 or TO unit 2

1) This bit is only effective for complete acknowledgment DB4200.DBX0.0 = 1
DB4200.DBX9.1 = 0 ⇒ job acknowledgment with status 99
DB4200.DBX9.1 = 1 ⇒ job acknowledgment with status 3

More information:

- Manual SINUMERIK 828D Tool Management

Table 10-81 DB4100 ... 41xx, signals from tool management

DB4100 ... DB41xx	**Jobs for loading, unloading and reloading, positioning the magazine Signals from tool management [r]**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBBy000	Multitool: Data in the multitool area							Job
DBBy001		Multitool: Job from the NC program	Multitool: Positioning	Job from the NC program	Positioning	Relocating	Unload	Loading
DBWy002	Reserved							
DBWy004	Reserved							
DBWy006	Source magazine number (INT)							
DBWy008	Source location number (INT)							
DBWy010	Target magazine number (INT)							
DBWy012	Target location number (INT)							
DBWy014								Loading/ unloading without magazine movement
DBWy016								
...								
DBWy056	Distance coding (Page 401) (INT)							
DBWy058	Multitool: Number of locations (INT)							
DBWy060	Multitool: Tool distance (FLOAT)							
DBWy062								
DBWy064	Multitool: Number (INT)							

DB4100 ... DB41xx	**Jobs for loading, unloading and reloading, positioning the magazine Signals from tool management [r]**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBWy066	Multitool: Location number (INT)							
DBWy068	Multitool: Spindle number / tool holder number (INT)							

xx = loading position

y [= 0 or 1]: TO unit 1 or TO unit 2

More information:

- Manual SINUMERIK 828D Tool Management

Table 10-82 DB4100 ... 41xx, signals from tool management

DB4100 ... DB41xx	**Feedback signals Signals from tool management [r]**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBBy100							Acknowl-edgment error	Acknowl-edgment OK
DBBy101	Reserved							
DBWy102	Reserved							
DBWy104	Error status (WORD)							
DBBy106	Reserved							
DBBy107	Reserved							
DBBy108	Acknowledgment step							
	7	6	5	4	3	2	1	Total ac-knowledg-ment:
DBBy109	Acknowledgment step							
	15	14	13	12	11	10	9	8
DBBy110	Acknowledgment step							
	23	22	21	20	19	18	17	16
DBBy111	Acknowledgment step							
	Reserved	30	29	28	27	26	25	24
DBWy112	Multitool: Location number (INT)							

xx = loading position

y [= 0 or 1]: TO unit 1 or TO unit 2

More information:

- Manual SINUMERIK 828D Tool Management

Table 10-83 DB4100 ... 41xx, job status

DB4100 ... DB41xx	**Job status [r]**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBWy120	Reserved							
DBWy122	Reserved							
DBWy124	Current magazine number of the tool (INT)							
DBWy126	Current location number of the tool (INT)							
DBWy128	Target magazine number of the tool (INT)							
DBWy130	Target location number of the tool (INT)							
DBWy132	Reserved							
DBWy134	Reserved							
DBWy136	Reserved							
DBWy138	Reserved							
DBWy140	Distance coding (Page 401) (INT)							
DBWy142	Multitool: Number of locations (INT)							
DBWy144	Multitool: Tool distance (FLOAT)							
DBWy146								
DBWy148	Multitool: Location number (INT)							

xx = loading position
y [= 0 or 1]: TO unit 1 or TO unit 2

More information:

- Manual SINUMERIK 828D Tool Management

10.1.10.2 Tool change

Table 10-84 DB4200 ... 42xx, signals to the tool management

DB4200 ... DB42xx	**Preparing and carrying out acknowledgments for tool change Signals to tool management [r/w]**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBBy000	Acknowledgment step							
	7	6	5	4	3	2	1	Total acknowledgment:
DBBy001	Acknowledgment step							
	15	14	13	12	11	10	9	8
DBBy002	Acknowledgment step							
	23	22	21	20	19	18	17	16
DBBy003	Acknowledgment step							
	Reserved	30	29	28	27	26	25	24

DB4200 ... DB42xx	**Preparing and carrying out acknowledgments for tool change Signals to tool management [r/w]**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBBy004	Multitool: Location number (INT)							
DBBy006	Reserved							
DBBy007	Reserved							
DBBy008	Reserved							
DBBy009							Job acknowledgment[1)]	Resetting the acknowledgment error
DBWy010	Reserved							
DBWy012	Reserved							
DBWy014	Reserved							
DBWy016	Reserved							
DBWy018	Reserved							
DBWy020	Reserved							
DBWy022	Reserved							
DBWy024	Reserved							
DBWy026	Reserved							

xx = index of the spindle/toolholder

y [= 0 or 1]: TO unit 1 or TO unit 2

1) This bit is only effective for complete acknowledgment DB4000.DBX0.0 = 1
DB4000.DBX9.1 = 0 ⇒ job acknowledgment with status 99
DB4000.DBX9.1 = 1 ⇒ job acknowledgment with status 3

More information:

- Manual SINUMERIK 828D Tool Management

Table 10-85 DB4300 ... 43xx, signals from the tool management, jobs

DB4300 ... DB43xx	**Preparing and carrying out jobs for the tool change Signals from tool management [r]**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBBy000	Multitool: Data in the multitool area							Job is still active
DBBy001	Tool remains in spindle	Manual tool		No old tool	T0	Prepare change	Change tool (initiated by: M06)	Fixed-location coded
		replace	load					
DBWy002	Reserved							
DBBy004	Reserved							
DBBy005	Reserved							

DB4300 ... DB43xx	**Preparing and carrying out jobs for the tool change Signals from tool management [r]**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBWy006	Source magazine number for new tool (INT)							
DBWy008	Source location number for new tool (INT)							
DBWy010	Reserved							
DBWy012	Reserved							
DBWy014	Reserved							
DBWy016	Reserved							
DBWy018	Target magazine number for old tool (INT)							
DBWy020	Target location number for old tool (INT)							
DBWy022	Location type (INT)							
DBWy024	Size, left (INT)							
DBWy026	Size, right (INT)							
DBWy028	Reserved							
DBWy030	Reserved							
DBBy032	Tool status for new tool							
	Tool has been in use	Tool fixed-location coded	Tool being changed	Prewarning limit reached	Measure tool	Tool disabled	Enable tool	Active tool
DBBy033	Tool status for new tool							
	Manual tool	1:1 exchange	Reserved	Master tool	Tool to be loaded	Tool to be unloaded	Disabled, but ignore	Identifier for tools in buffer storage
DBWy034	New tool: Internal T number of the NC (INT)							
DBWy036	Reserved							
DBWy038	Reserved							
DBWy040	Reserved							
DBWy042	Reserved							
DBWy044	Free parameter 1 (DWORD)							
DBWy048	Free parameter 2 (DWORD)							
DBWy052	Free parameter 3 (DWORD)							
DBWy056	 Distance coding (Page 402) (INT)							
DBWy058	Multitool: Number of locations (INT)							
DBWy060	Multitool: Tool distance (FLOAT)							
DBWy064	Multitool: Number (source) of the new tool (INT)							
DBWy066	Multitool: Location number (source) of the new tool (INT)							
DBWy068	Multitool: Number (target) of the old tool (INT)							
DBWy070	Multitool: Location number (target) of the old tool (INT)							
DBWy072	Location type (INT)							
DBWy074	Size left (INT)							
DBWy076	Size right (INT)							
DBWy078	Size top (INT)							

DB4300 ... DB43xx	**Preparing and carrying out jobs for the tool change Signals from tool management [r]**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBWy080	Size bottom (INT)							
DBWy082	Tool status for new tool (INT)							
DBWy084	T number of the tool (INT)							
DBWy086	Spindle number / tool holder number (INT)							
DBWy088	Multitool: Original magazine number (INT)							
DBWy090	Multitool: Original location number (INT)							

xx = tool holder

y [= 0 or 1]: TO unit 1 or TO unit 2

More information:

- Manual SINUMERIK 828D Tool Management

Table 10-86 DB4300 ... 43xx, signals from the tool management

DB4300 ... DB43xx	**Feedback signals Signals from tool management [r]**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBBy100							Acknowl-edgment error	Acknowl-edgment OK
DBBy101	Reserved							
DBBy102	Reserved							
DBWy104	Error status acknowledgment (WORD)							
DBBy106	Reserved							
DBBy107	Reserved							
DBBy108	Acknowledgment step							
	7	6	5	4	3	2	1	0
DBBy109	Acknowledgment step							
	15	14	13	12	11	10	9	8
DBBy110	Acknowledgment step							
	23	22	21	20	19	18	17	16
DBBy111	Acknowledgment step							
	Reserved	30	29	28	27	26	25	24
DBBy112	Multitool: Location number (INT)							

xx = tool holder

y [= 0 or 1]: TO unit 1 or TO unit 2

More information:

- Manual SINUMERIK 828D Tool Management

Table 10-87 DB4300 ... 43xx, job status

DB4300 ... DB43xx	**Job status [r]**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBWy120	Reserved							
DBWy122	Reserved							
DBWy124	Current magazine number for new tool (INT)							
DBWy126	Current location number for new tool (INT)							
DBWy128	Magazine number for new tool, target (INT)							
DBWy130	Location number for new tool, target (INT)							
DBWy132	Current magazine number for old tool (INT)							
DBWy134	Current location number for old tool (INT)							
DBWy136	Magazine number for old tool, target (INT)							
DBWy138	Location number for old tool, target (INT)							
DBWy140	Distance coding (Page 402) (INT)							
DBWy142	Multitool: Number of locations (INT)							
DBWy144	Multitool: Tool distance (FLOAT)							
DBWy146								
DBWy148	Multitool: Location number (INT)							
DBWy150	Reserved							
DBWy152	Acknowledgment step							
	38	37	36	35	34	33	32	31
DBWy154	Acknowledgment step							
	46	45	44	43	42	41	40	39
DBWy156	Acknowledgment step							
	54	53	52	51	50	49	48	47
DBWy158	Acknowledgment step							
	Reserved	Reserved	60	59	58	57	56	55

xx = tool holder

y [= 0 or 1]: TO unit 1 or TO unit 2

More information:

- Manual SINUMERIK 828D Tool Management

10.1.11 PLC machine data

Table 10-88 INT values (MD14510 $MN_USER_DATA_INT)

DB4500	**Signals from NC** **Signals from NC → PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBW0000	INT value (WORD / 2 bytes)							
DBW0002	INT value (WORD / 2 bytes)							
DBW0004	INT value (WORD / 2 bytes)							
DBW0006	INT value (WORD / 2 bytes)							
...	...							
DBW0124	INT value (WORD / 2 bytes)							
DBW0126	INT value (WORD / 2 bytes)							

Table 10-89 HEX values (MD14512 $MN_USER_DATA_HEX)

DB4500	**Signals from NC** **Signals from NC → PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB1000	HEX value (BYTE)							
DBB1001	HEX value (BYTE)							
DBB1002	HEX value (BYTE)							
DBB1003	HEX value (BYTE)							
...	...							
DBB1062	HEX value (BYTE)							
DBB1063	HEX value (BYTE)							

Table 10-90 FLOAT values (MD14514 $MN_USER_DATA_FLOAT)

DB4500	**Signals from NC [r]** **Signals from NC → PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBD2000	FLOAT value (REAL / 4 bytes)							
DBD2004	FLOAT value (REAL / 4 bytes)							
DBD2008	FLOAT value (REAL / 4 bytes)							
DBD2012	FLOAT value (REAL / 4 bytes)							
DBD2016	FLOAT value (REAL / 4 bytes)							
...								
DBD2056	FLOAT value (REAL / 4 bytes)							
DBD2060	FLOAT value (REAL / 4 bytes)							

Table 10-91 User alarm: Alarm response configuration (MD14516 $MN_USER_DATA_PLC_ALARM)

DB4500	**Signals from NC** **Signals from NC → PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB3000	Alarm response / cancel criterion, alarm 700000							
DBB3001	Alarm response / cancel criterion, alarm 700001							
DBB3002	Alarm response / cancel criterion, alarm 700002							
...	...							
DBB3247	Alarm response / cancel criterion, alarm 700247							

Table 10-92 User alarm: Channel assignment of the configured alarm response (MD14518 $MN_USER_DATA_PLC_ALARM_ASSIGN)

DB4500	**Signals from NC** **Signals from NC → PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB4000	Channel assignment / alarm response, alarm 700000							
DBB4001	Channel assignment / alarm response, alarm 700001							
DBB4002	Channel assignment / alarm response, alarm 700002							
...	...							
DBB4247	Channel assignment / alarm response, alarm 700247							

10.1.12 Synchronized actions signals

Table 10-93 DB4600 / 460x, signals synchronized actions to channel

DB4600 ... **DB460x**	**Synchronized action signals to the channel [r/w]** **Signals from PLC → HMI**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB0000	Deactivate synchronized action with ID...							
	8	7	6	5	4	3	2	1
DBB0001	Deactivate synchronized action with ID...							
	16	15	14	13	12	11	10	9
DBB0002	Deactivate synchronized action with ID...							
	24	23	22	21	20	19	18	17
DBB0003	Deactivate synchronized action with ID...							
	32	31	30	29	28	27	26	25
DBB0004	Deactivate synchronized action with ID...							
	40	39	38	37	36	35	34	33
DBB0005	Deactivate synchronized action with ID...							
	48	47	46	45	44	43	42	41
DBB0006	Deactivate synchronized action with ID...							
	56	55	54	53	52	51	50	49

DB4600 ... DB460x	**Synchronized action signals to the channel [r/w] Signals from PLC → HMI**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB0007	Deactivate synchronized action with ID...							
	64	63	62	61	60	59	58	57

Table 10-94 DB4700 / 470x, signals, synchronized actions to channel

DB4700 ... DB470x	**Synchronized action signals from the channel [r] Signals from NC → PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB0000	Synchronized action with ID... can be disabled from the PLC							
	8	7	6	5	4	3	2	1
DBB0001	Synchronized action with ID... can be disabled from the PLC							
	16	15	14	13	12	11	10	9
DBB0002	Synchronized action with ID... can be disabled from the PLC							
	24	23	22	21	20	19	18	17
DBB0003	Synchronized action with ID... can be disabled from the PLC							
	32	31	30	29	28	27	26	25
DBB0004	Synchronized action with ID... can be disabled from the PLC							
	40	39	38	37	36	35	34	33
DBB0005	Synchronized action with ID... can be disabled from the PLC							
	48	47	46	45	44	43	42	41
DBB0006	Synchronized action with ID... can be disabled from the PLC							
	56	55	54	53	52	51	50	49
DBB0007	Synchronized action with ID... can be disabled from the PLC							
	64	63	62	61	60	59	58	57

10.1.13 Reading and writing PLC variables

Table 10-95 DB4900, reading and writing PLC variables

DB4900	**PLC variables [r/w] Signals from the PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB0000	Offset [0]							
DBB0001	Offset [1]							
DBB0002	Offset [2]							
...	...							
DBB4094	Offset [4094]							
DBB4095	Offset [4095]							

Note

The user's programming engineer (NC and PLC) is responsible for organizing (structuring) this memory area. Every storage position in the memory can be addressed provided that the limit is selected according to the appropriate data format (i.e. a 'DWORD' for a 4-byte limit, a WORD for a 2-byte limit, etc.). The memory area is always accessed with the information about the data type and the position offset within the memory area.

10.1.14 Functions from the channel

Table 10-96 DB5300, change signals TOOLMAN functions

DB5300	**TOOLMAN functions [r]** **Signals from NC → PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB0000							Tool	
							Limit value reached  see also (Page 404)	Prewarning limit reached  see also (Page 404)
DBB0001								
DBB0002								
DBB0003								

Table 10-97 DB5300, transferred TOOLMAN functions

DB5300	**TOOLMAN functions [r]** **Signals from NC → PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBD1000	T number for tool prewarning limit (DINT) 							
DBD1004	T number for tool limit value (DINT) 							
DBD1008								
DBD1012								

10.1.15 Axis actual values and distances-to-go

Table 10-98 DB5700 ... 57xx, signals from axis/spindle

DB5700 ... DB57xx	Signals from the axis/spindle [r] Signals from the NC → PLC							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBD0000	Axis actual value (REAL)							
DBD0004	Axis distance-to-go (REAL)							

Note

The axis actual values and distances-to-go can be separately requested:

- DB2600.DBX0001.1 Request axis actual values
- DB2600.DBX0001.2 Request axis distances-to-go

If the particular request is set, then the NC supplies these values for all axes.

10.1.16 Safety Integrated

Table 10-99 DB6000 ... 60xx, drive-based Safety Integrated

DB6000 ... DB60xx	Signals to axis [r/w] PLC → drive							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB0								Test stops for extended functions
DBB1								
DBB2								
DBB3			External brake closed (SBC)	Torque 1 or 2	Direction of rotation	Test with brake 1 or 2 (SBT)	Start brake test (SBT)	Select safe brake test (SBT)

More information:

- Function Manual for SINUMERIK 828D SINAMICS S120 Safety Integrated

Table 10-100 DB6100 ... 61xx, drive-based Safety Integrated

DB6100 ... DB61xx	**Signals from axis [r] Drive → PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB0	Safety error active	ESR requested				Bit 1 limit value Safely limited speed (SLS)	Bit 0 limit value Safely limited speed (SLS)	
DBB1	Safety error with Stop A	Safely-limited speed selected (SLS)	Safe operating stop selected (SOS)	Safely-limited speed active (SLS)	Safe operating stop active (SOS)	Safe stop 2 (SS2)	Safe stop 1 (SS1)	Safe torque off (STO)
DBB2			Acceptance test stop requested	Acceptance test stop active			Safe direction negative (SDI)	Safe direction positive (SDI)
DBB3	Safely limited position is selected (SLP)			Bit 0 For area Safely limited position (SLP)				
DBD4	Speed limit							
DBB8	Acceptance test: Safely limited position selected (SLP)	Acceptance test: Safely limited position active (SLP)						
DBB9	Sign load torque negative	Close external brake (SBC)	Brake test (SBT)					
			completed	OK	Active	with brake 2	Setpoint input during SBT in the drive	Safe brake test (SBT)
DBB10								
DBB11								

More information:

- Function Manual for SINUMERIK 828D SINAMICS S120 Safety Integrated

10.1.17 Transfer and acknowledgement step tables

Table 10-101 DB9900, constant transfer step table

DB9900	**Constant transfer step table [r]**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBW0000	Transfer step 1 source magazine number (INT)							
DBW0002	Transfer step 1 source location number (INT)							
DBW0004	Transfer step 1 target magazine number (INT)							
DBW0006	Transfer step 1 target location number (INT)							
DBW0008	Transfer step 2 source magazine number (INT)							
DBW0010	Transfer step 2 source location number (INT)							
DBW0012	Transfer step 2 target magazine number (INT)							
DBW0014	Transfer step 2 target location number (INT)							
...	...							
DBW0504	Transfer step 64 source magazine number (INT)							
DBW0506	Transfer step 64 source location number (INT)							
DBW0508	Transfer step 64 target magazine number (INT)							
DBW0510	Transfer step 64 target location number (INT)							

More information:

- Commissioning Manual SINUMERIK 828D Commissioning CNC

Table 10-102 DB9901, variable transfer step table

DB9901	**Variable transfer step table [r/w]**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBW0000	Transfer step 101 source magazine number (INT)							
DBW0002	Transfer step 101 source location number (INT)							
DBW0004	Transfer step 101 target magazine number (INT)							
DBW0006	Transfer step 101 target location number (INT)							
DBW0008	Transfer step 102 source magazine number (INT)							
DBW0010	Transfer step 102 source location number (INT)							
DBW0012	Transfer step 102 target magazine number (INT)							
DBW0014	Transfer step 102 target location number (INT)							
...	...							
DBW0504	Transfer step 164 source magazine number (INT)							
DBW0506	Transfer step 164 source location number (INT)							
DBW0508	Transfer step 164 target magazine number (INT)							
DBW0510	Transfer step 164 target location number (INT)							

More information:

- Commissioning Manual SINUMERIK 828D Commissioning CNC

Table 10-103 DB9902, acknowledgement step table

DB9902	**Acknowledgement step table [r]**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB0000	Acknowledgement step 1 transfer step for new tool							
DBB0001	Acknowledgement step 1 transfer step for old tool							
DBB0002	Acknowledgement step 1 acknowledgement status							
DBB0003	Acknowledgement step 1 reserved							
DBB0004	Acknowledgement step 2 transfer step for new tool							
DBB0005	Acknowledgement step 2 transfer step for old tool							
DBB0006	Acknowledgement step 2 acknowledgement status							
DBB0007	Acknowledgement step 2 reserved							
...	...							
DBB0236	Acknowledgement step 60 transfer step for new tool							
DBB0237	Acknowledgement step 60 transfer step for old tool							
DBB0238	Acknowledgement step 60 acknowledgement status							
DBB0239	Acknowledgment step 60 reserved							

More information:

- Commissioning Manual SINUMERIK 828D Commissioning CNC

10.1.18 Maintenance planner

Table 10-104 DB9903, initial (start) data

DB9903	**Initial data table [r]**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBW0000	Interval 1 [h]							
DBW0002	Time of first warning 1 [h]							
DBW0004	Number of warnings to be output 1							
DBW0006	Reserved 1							
DBW0008	Interval 2 [h]							
DBW0010	Time of first warning 2 [h]							
DBW0012	Number of warnings to be output 2							
DBW0014	Reserved 2							
...	...							
DBW0248	Interval 32 [h]							
DBW0250	Time of first warning 32 [h]							
DBW0252	Number of warnings to be output 32							
DBW0254	Reserved 32							

More information:

- Commissioning Manual SINUMERIK 828D Commissioning CNC

Table 10-105 DB9904, actual data

DB9904	**Actual data table [r]** **HMI → PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBW0000	Remaining time 1 [h]							
DBW0002	Number of warnings output 1 [h]							
DBW0004	Reserved_1 1							
DBW0006	Reserved_2 1							
DBW0008	Remaining time 2 [h]							
DBW0010	Number of output alarms 2 [h]							
DBW0012	Reserved_1 2							
DBW0014	Reserved_2 2							
...	...							
DBW0248	Remaining time 32 [h]							
DBW0250	Number of output alarms 32 [h]							
DBW0252	Reserved_1 32							
DBW0254	Reserved_2 32							

More information:

- Commissioning Manual SINUMERIK 828D Commissioning CNC

Table 10-106 DB9905, Easy Extend interface

DB9905	**Easy Extend interface [r/w]** **Signals from HMI ↔ PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB0000						Deacti-vate_1	activate_1	Enable_1
DBB0001								
DBB0002							Error_1	IsActive_1
DBB0003	DeviceID_1							
DBB0004						Deacti-vate_2	activate_2	Enable_2
DBB0005								
DBB0006							Error_2	IsActive_2
DBB0007	DeviceID_2							
...	...							
DBB0252						Deacti-vate_64	Activate_64	Enable_64
DBB0253								
DBB0254							Error_64	IsActive_64
DBB0255	DeviceID_64							

More information:

- Commissioning Manual SINUMERIK 828D Commissioning CNC

10.1.19 Ctrl Energy

Table 10-107 DB9906, energy-saving profiles

DB9906	**Ctrl Energy [r/w]**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB0000	Control signals							
							Set time to prewarning limit	Immediately activate energy-saving profile
DBB0001	Control signals (HMI → PLC)							
								Immediately activate energy-saving profile
DBB0002	Signals to check the energy-saving profile							
							PLC user signal	Master computer signal
DBB0003	Reserved							
DBB0004	Control signals							
							Activation time T1 has expired	Energy-saving profile active
DBB0005	Reserved							
DBW0006	Actual value: Actual value T1							
DBW0008	Actual value: Actual value T2							
DBB0010	Effectiveness, profile							
							Disable energy-saving profile	Energy-saving profile configured
DBB0011	Status conditions (HMI → PLC)							
						Screen change active	Data transfer active	Operator panel
DBB0012	Status conditions (HMI → PLC)							
								Machine control panel used
DBB0013	Status conditions (HMI → PLC)							
					NC channel 4 in reset	NC channel 3 in reset	NC channel 2 in reset	NC channel 1 in reset
DBB0014								

DB9906	**Ctrl Energy [r/w]**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB0015	Status conditions (HMI → PLC)							
							PLC user signal	Master computer signal
DBW0016	Status conditions (HMI → PLC) Activation time T1							
DBW0018	Status conditions (HMI → PLC) Prewarning time T2							

Additional profile instances:

Energy profile 1 (n=0):	DB9906.DBB0000 ... DBB0019
Energy profile 2 (n=20):	DB9906.DBB0020 ... DBB0039
Energy profile 3 (n=40):	DB9906.DBB0040 ... DBB0059
Energy profile 4 (n=60):	DB9906.DBB0060 ... DBB0079
Energy profile 5 (n=80):	DB9906.DBB0080 ... DBB0099
Energy profile 6 (n=100):	DB9906.DBB0100 ... DBB0119
Energy profile 7 (n=120):	DB9906.DBB0120 ... DBB0139
Energy profile 8 (n=140):	DB9906.DBB0140 ... DBB0159

More information:

- System Manual SINUMERIK 828D Ctrl-Energy

Table 10-108 DB9907, signals for SENTRON PAC

DB9907	**SENTRON PAC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB0000 PLC → HMI			Regenerative energy: Integration using FW	Regenerative energy: Integration using FW	Regenerative energy is read by SENTRON PAC	Energy fed in is read by SENTRON PAC	SENTRON PAC represents the machine	Display manual value
DBB0001								PLC FW should perform measurement
DBB0002								
HMI → PLC								Measurement in progress
DBB0003								Power display on
DBD0004	Manual value (REAL) to HMI							

DB9907	**SENTRON PAC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBD0008	Total active power (REAL) to HMI							
DBD0012	Measured related active energy in kWh (REAL) to HMI							
DBD0016	Measured supplied active energy in kWh (REAL) to HMI							
DBD0020	Total active power in watts (REAL) from SENTRON							
DBD0024	Drawn active energy at tariff 1 (F) in Wh (REAL) from SENTRON							
DBD0028	Supplied active energy at tariff 1 (F) in Wh (REAL) from SENTRON							
DBD0032	Imported active energy in kWh day (REAL) to HMI							
DBD0036	Supplied active energy in kWh day (REAL) to HMI							
DBD0040	Imported active energy in kWh previous day (REAL) to HMI							
DBD0044	Imported active energy in kWh previous day (REAL) to HMI							
DBD0048	Imported active energy in kWh month (REAL) to HMI							
DBD0052	Supplied active energy in kWh month (REAL) to HMI							
DBD0056	Imported active energy in kWh previous month (REAL) to HMI							
DBD0060	Supplied active energy in kWh previous month (REAL) to HMI							
DBD0064	Imported active energy in kWh year (REAL) to HMI							
DBD0068	Supplied active energy in kWh year (REAL) to HMI							
DBD0072	Imported active energy in kWh previous year (REAL) to HMI							
DBD0076	Supplied active energy in kWh previous year (REAL) to HMI							
DBB0080 ... DBB0095	Reserved							
DBB0096	ProductionAct							
PLC → AP/ HMI								

DB9907	SENTRON PAC							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB0097						Value invalid in		
UP						DBD0028	DBD0024	DBD0020
DBB0098	Value invalid in							
UP	DBD0384	DBD0344	DBD0304	DBD0264	DBD0224	DBD0184	DBD0144	DBD0104
DBB0099							Value invalid in	
UP							DBD0464	DBD0424

More information:

- System Manual SINUMERIK 828D Ctrl-Energy

Table 10-109 DB9907, SENTRON PAC, auxiliary devices

DB9907	SENTRON PAC, auxiliary devices							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBBn + 100	Control/command bits							
PLC → AP / HMI	Reset data structure			Input mode: (energy or power)	Different values when measuring energy	Energy measurement running	Read energy actual value update	Process device
DBBn + 101	Reserved							
DBBn + 102	Reserved							
DBBn + 104	Active power or active energy of the auxiliary unit [kW] or [kWh]							
PLC → AP / HMI								
DBDn + 108	Drawn active energy of the auxiliary unit [kWh]							
PLC → AP / HMI								
DBDn + 112	Active energy supplied by the auxiliary unit [kWh]							
DBDn + 116	Active energy drawn by the auxiliary unit at the measurement start [kWh]							
PLC → AP / HMI								
DBDn + 120	Active energy supplied by the auxiliary unit at the measurement start [kWh]							
AP → HMI								
DBDn + 124	Active energy drawn by the auxiliary unit at the measurement end [kWh]							
AP → HMI								
DBDn + 128	Active energy supplied by the auxiliary unit at the measurement end [kWh]							
AP → HMI								
DBDn + 132	Reserved							
DBDn + 136	Reserved							

Auxiliary unit instances:

Auxiliary unit 1 (n=0):	DB9907.DBB0100 ... DBB0139
Auxiliary unit 2 (n=40):	DB9907.DBB0140 ... DBB0179
Auxiliary unit 3 (n=80):	DB9907.DBB0180 ... DBB0219
Auxiliary unit 4 (n=120):	DB9907.DBB0220 ... DBB0259
Auxiliary unit 5 (n=160):	DB9907.DBB0260 ... DBB0299
Auxiliary unit 6 (n=200):	DB9907.DBB0300 ... DBB0339
Auxiliary unit 7 (n=240):	DB9907.DBB0340 ... DBB0379
Auxiliary unit 8 (n=280):	DB9907.DBB0380 ... DBB0419
Auxiliary unit 9 (n=320):	DB9907.DBB0420 ... DBB0459
Auxiliary unit 10 (n=360):	DB9907.DBB0460 ... DBB0499

More information

- System Manual SINUMERIK 828D Ctrl-Energy

10.1.20 Spindle temperature sensor

Table 10-110 DB9908, **spindle temperature sensors**

DB9908	**ISM_TS** **Sensor → PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBWn + 0	Sensor n Sensor installation location							
DBWn + 2	Reserved							
DBDn + 4	Sensor n Temperature sensor actual value [°C]							
DBDn + 8	Sensor n Temperature sensor warning threshold value [°C]							
DBWn + 12	Sensor n Number of alarm limit value violations							
DBBn + 14	Sensor n Last alarm limit value violation: Year							
DBBn + 15	Sensor n Last alarm limit value violation: Month							

DB9908	ISM_TS Sensor → PLC							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBBn + 16	Sensor n Last alarm limit value violation: Day							
DBBn + 17	Sensor n Last alarm limit value violation: Hour							
DBBn + 18	Sensor n Last alarm limit value violation: Minute							
DBBn + 19	Sensor n Last alarm limit value violation: Seconds							
DBBn + 20	Sensor n Duration of the warning limit value violations							
DBBn + 24	Sensor n Temperature sensor fault threshold value [°C]							
DBBn + 28	Sensor n Number of fault limit value violations							
DBBn + 30	Sensor n Last alarm limit value violation: Year							
DBBn + 31	Sensor n Last alarm limit value violation: Month							
DBBn + 32	Sensor n Last alarm limit value violation: Day							
DBBn + 33	Sensor n Last alarm limit value violation: Hour							
DBBn + 34	Sensor n Last alarm limit value violation: Minute							
DBBn + 35	Sensor n Last alarm limit value violation: Seconds							

DB9908	**ISM_TS** **Sensor → PLC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBDn + 36	Sensor n Duration of the fault limit value violation							

Spindle/temperature sensor instances

Spindle 1, temperature sensor 1 (n=0): DB9908.DBB0000...DBB0039
Spindle 1, temperature sensor 2 (n=40): DB9908.DBB0040...DBB0079
Spindle 1, temperature sensor 3 (n=80): DB9908.DBB0080...DBB0119
Spindle 1, temperature sensor 4 (n=120): DB9908.DBB0120...DBB0159
Spindle 1, temperature sensor 5 (n=160): DB9908.DBB0160...DBB0199
Spindle 1, temperature sensor 6 (n=200): DB9908.DBB0200...DBB0239

10.1.21 Selecting NC variables

Table 10-111 DB9910, selected NC data

DB9910	**Selected NC data [r]** **PLC → NC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB0000	Variable index, variable 1							
DBB0001	Syntax ID							
DBB0002	Area							
DBB0003	Unit							
DBW0004	Column index (WORD)							
DBW0006	Line index (WORD)							
DBB0008	Block							
DBB0009	Number of lines							
DBB0010	Type							
DBB0011	Length							
DBB0012	Variable index variable 2							
DBB0013	Syntax ID							
DBB0014	Area							
DBB0015	Unit							
DBW0016	Column index (WORD)							
DBW0018	Line index (WORD)							
DBB0020	Block							
DBB0021	Number of lines							
DBB0022	Type							

DB9910	**Selected NC data [r]** **PLC → NC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB0023	Length							
...	...							
DBB0492	Variable index variable 42							
DBB0493	Syntax ID							
DBB0494	Area							
DBB0495	Unit							
DBW0496	Column index (WORD)							
DBW0498	Line index (WORD)							
DBB0500	Block							
DBB0501	Number of lines							
DBB0502	Type							
DBB0503	Length							

Table 10-112 DB9911, selected NC data

DB9911	**Selected NC data [r]** **PLC → NC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB0000	Variable index, variable 1							
DBB0001	Syntax ID							
DBB0002	Area							
DBB0003	Unit							
DBW0004	Column index (WORD)							
DBW0006	Line index (WORD)							
DBB0008	Block							
DBB0009	Number of lines							
DBB0010	Type							
DBB0011	Length							
DBB0012	Variable index variable 2							
DBB0013	Syntax ID							
DBB0014	Area							
DBB0015	Unit							
DBW0016	Column index (WORD)							
DBW0018	Line index (WORD)							
DBB0020	Block							
DBB0021	Number of lines							
DBB0022	Type							
DBB0023	Length							
...	...							
DBB0492	Variable index variable 42							
DBB0493	Syntax ID							

DB9911	**Selected NC data [r]** **PLC → NC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB0494	Area							
DBB0495	Unit							
DBW0496	Column index (WORD)							
DBW0498	Line index (WORD)							
DBB0500	Block							
DBB0501	Number of lines							
DBB0502	Type							
DBB0503	Length							

Table 10-113 DB9912, selected NC data

DB9912	**Selected NC data [r]** **PLC → NC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB0000	Variable index, variable 1							
DBB0001	Syntax ID							
DBB0002	Area							
DBB0003	Unit							
DBW0004	Column index (WORD)							
DBW0006	Line index (WORD)							
DBB0008	Block							
DBB0009	Number of lines							
DBB0010	Type							
DBB0011	Length							
DBB0012	Variable index variable 2							
DBB0013	Syntax ID							
DBB0014	Area							
DBB0015	Unit							
DBW0016	Column index (WORD)							
DBW0018	Line index (WORD)							
DBB0020	Block							
DBB0021	Number of lines							
DBB0022	Type							
DBB0023	Length							
...	...							
DBB0492	Variable index variable 42							
DBB0493	Syntax ID							
DBB0494	Area							
DBB0495	Unit							
DBW0496	Column index (WORD)							
DBW0498	Line index (WORD)							

DB9912	**Selected NC data [r]** **PLC → NC**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB0500	Block							
DBB0501	Number of lines							
DBB0502	Type							
DBB0503	Length							

10.1.22 Configuration of the user alarms

Table 10-114 Configuring user alarms

DB9913	**Alarm configuration [r]**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBW0	Alarm response / cancel criterion, channel assignment alarm 701000							
DBW2	Alarm response / cancel criterion, channel assignment alarm 701001							
DBW4	Alarm response / cancel criterion, channel assignment alarm 701002							
...	...							
DBW1998	Alarm response / cancel criterion, channel assignment alarm 701999							

10.1.23 Access to SINAMICS signals via PLC

Table 10-115 DB9914, signals for Active Line Module (ALM)

DB9914	**ALM_IF [r/w]**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBBn+0 PLC → ALM	STW1.15	STW1.14	STW1.13	STW1.12	STW1.11	STW1.10 Control by PLC	STW1.9	STW1.8
DBBn+1 PLC → ALM	STW1.7 Acknowl-edge faults	STW1.6 Disable generator operation	STW1.5 Disable mo-tor opera-tion	STW1.4	STW1.3 Operation enabled	STW1.2	STW1.1 No OFF2	STW1.0 ON/OFF1 "0/1"

DB9914	**ALM_IF [r/w]**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBBn+2 ALM→ PLC	ZSW1.15	ZSW1.14	ZSW1.13	ZSW1.12 Line contactor closed	ZSW1.11 Precharging completed	ZSW1.10	ZSW1.9 Control request to PLC	ZSW1.8
DBBn+3 ALM→ PLC	ZSW1.7 Alarm active	ZSW1.6 Switching on inhibited	ZSW1.5	ZSW1.4 No OFF2 active	ZSW1.3 Fault active	ZSW1.2 Operation enabled	ZSW1.1 Ready to operate	ZSW1.0 Ready to start

ALM instances:

ALM 1 (n=0): DB9914.DBB0 ... DBB3

ALM 2 (n=4): DB9914.DBB4 ... DBB7

10.1.24 Tool Ident Connection

10.1.24.1 DB9915, Tool Ident Connection

Table 10-116 DB9915 (1000 bytes)

DB9915	**Tool Ident Connection**							
Byte	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
DBB 0	Data storage medium data							
DBB 1	Data storage medium data							
DBB 2	Data storage medium data							
	...							
	...							
DBB 508	Data storage medium data							
DBB 509	Data storage medium data							
DBB 510	Data storage medium data							
DBB 511	Data storage medium data							
	...							

DB9915	Tool Ident Connection							
Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
DBB 999	Data storage medium data							

10.2 Interface signals - detailed description

10.2.1 User alarm

10.2.1.1 Active alarm response

Table 10-117 DB1600.DBX2000.0, NC start disable

DB1600.DBX2000.0	NC start disable	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The NC start disable is active and prevents a part program from being started with the "NC start" = 1 signal.	
Signal state 0	The NC start disable is not active.	
Special cases, errors, etc.	The start of a part program selected in the channel by the `START` part program command in another channel (program coordination) is not prevented by the "NC start disable" = 1 signal.	
See also	Table 10-126 DB1700.DBX7.1, NC start (Page 218) Table 10-248 DB3200.DBX7.0, NC start disable (Page 272)	

Table 10-118 DB1600.DBX2000.1, read-in disable

DB1600.DBX2000.1	Read-in disable	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The main run does not read in any preprocessed part program blocks. Note: The signal is only active in the AUTOMATIC and MDI modes.	
Signal state 0	The main run reads in preprocessed part program blocks.	
See also	Table 10-292 DB3300.DBX3.0, program status running (Page 295)	

10.2.2 Signals from/to HMI

10.2.2.1 Program control signals from HMI

Table 10-119 DB1700.DBX0.1, configured stop funct. (CST) selected

DB1700.DBX0.1	**Configured stop funct. (CST) selected** **HMI → PLC**
Edge evaluation: No	cyclic
Signal state 1	Activation of the configured stop is requested.
Signal state 0	Activation of the configured stop is not requested.
Application	"Activate configured stop" (CST) is selected via the SINUMERIK Operate user interface in the "Automatic" > "Program control" operating area by setting the HMI/ PLC interface signal DB170x.DBX0.1. The MMC signal "Activate configured stop" must then be transferred to the signal DB320x.DBX.7.6 via the PLC program.
See also	DB320x.DBX7.6, configured stop function activation (Page 275)

Table 10-120 DB1700.DBX0.3, DRF selected

DB1700.DBX0.3	**DRF selected** **Signals from HMI → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	DRF is selected on the operator panel front. The PLC user program transfers this signal to the "Activate DRF" signal once the corresponding logic operation has been performed. As soon as DRF is active, the DRF offset can be changed in AUTOMATIC or MDI mode using the handwheel assigned to the axis.	
Signal state 0	DRF is not selected on the operator panel front.	
See also	JOG mode	
More information	Function Manual SINUMERIK 828D Axes and Spindles	

Table 10-121 DB1700.DBX0.5, M01 selected

DB1700.DBX0.5	**M01 selected** **Signals from HMI → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The "Activate M01" program control is selected from the user interface. However, this does not activate the function.	
Signal state 0	The "Activate M01" program control is not selected from the user interface.	
See also	Table 10-232 DB3200.DBX0.5, activate M01 (Page 263) Table 10-325 DB3300.DBX4002.5, associated M01/M00 active (Page 308)	
More information	Function Manual SINUMERIK 828D basic functions	

Table 10-122 DB1700.DBX0.6, dry run feedrate selected

DB1700.DBX0.6	**Dry run feedrate selected** **Signals to channel: HMI → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	Dry run feedrate is selected. Instead of the programmed feedrate, the dry run feedrate entered in SD42100 $SC_DRY_RUN_FEED is active. When activated from the operator panel, the dry run feedrate signal is automatically entered in the PLC interface and transferred by the PLC user program to the "Activate dry run feedrate" PLC interface signal.	
Signal state 0	Dry run feedrate is not selected. The programmed feedrate is active.	
See also	Table 10-233 DB3200.DBX0.6, activate dry run feedrate (Page 263) SD42100 $SC_DRY_RUN_FEED: Dry run feedrate	
More information	Function Manual SINUMERIK 828D Axes and Spindles	

Table 10-123 DB1700.DBX1.3, feedrate override selected for rapid traverse

DB1700.DBX1.3	**Feedrate override selected for rapid traverse** **Signals to channel: HMI → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The feedrate override switch also functions as the rapid override switch. Override values above 100% are limited to the maximum value for 100% rapid override. The "Feed override selected for rapid traverse" signal is automatically entered in the PLC interface from the operator panel and transferred by the PLC user program to the "Rapid override active" PLC signal. The "Feed override" signal is also copied from the PLC user program to the "Rapid override" interface signal.	
Signal state 0	The feedrate override switch does not function as the rapid override switch.	
Application	The interface signal is used when no separate rapid override switch is available.	
See also	Table 10-240 DB3200.DBB4, feedrate override (Page 267) Table 10-241 DB3200.DBB5, rapid traverse override (Page 268) Table 10-246 DB3200.DBX6.6, rapid traverse override active (Page 271)	
More information	Function Manual SINUMERIK 828D Axes and Spindles	

Table 10-124 DB1700.DBX1.7, program test selected

DB1700.DBX1.7	**Program test selected** **Signals from HMI → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The "Program test" program control is selected from the user interface. However, this does not activate the function.	
Signal state 0	The "Program test" program control is not selected from the user interface.	
See also	Table 10-238 DB3200.DBX1.7, activate program test (Page 265) Table 10-291 DB3300.DBX1.7, program test active (Page 294)	
More information	Function Manual SINUMERIK 828D Axes and Spindles	

Table 10-125 DB1700.DBX2.0 to 3.1, skip block selected

DB1700.DBX2.0 to 3.1	**Skip block selected** **Signals from HMI → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The "Skip block" program control is selected from the user interface. However, this does not activate the function.	
Signal state 0	The "Skip block" program control is not selected from the user interface.	
See also	Table 10-265 DB3200.DBX15.6 and .7, skip block active /8 and /9 (Page 281)	
More information	Function Manual SINUMERIK 828D basic functions	

Table 10-126 DB1700.DBX7.1, NC start

DB1700.DBX7.1	**NC start** **Signals to PLC: HMI → PLC**	
Edge evaluation: Yes	Signal updated: cyclic	
Edge change 0 → 1	AUTOMATIC mode: The selected NC program is • started or • is continued or • the auxiliary functions subsequently stored during the program interruption are output. If data is transferred from the PLC to the NC during the "Program interrupted" state, then this data is immediately cleared with "NC start". MDI mode: The entered block information or part program blocks are released for execution.	
Edge change 1 → 0	No effect.	
More information	Function Manual SINUMERIK 828D basic functions	

Table 10-127 DB1700.DBX7.3, NC stop

DB1700.DBX7.3	**NC stop** **Signals to PLC: HMI → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	AUTOMATIC or MDI mode: Execution of the active part program in the channel is stopped. The axes (not spindles) are braked to a standstill maintaining the parameterized acceleration rates. • Program status: Stopped • Channel status: Interrupted JOG mode: In JOG mode, incompletely traversed incremental paths (INC...) are executed at the next "NC start". Note: If data is transferred to the NC after "NC stop" (e.g. tool offset), the data is cleared with the next "NC start".	
Signal state 0	No effect.	

DB1700.DBX7.3	**NC stop** **Signals to PLC: HMI → PLC**
See also	Table 10-294 DB3300.DBX3.2, program status stopped (Page 296) Table 10-298 DB3300.DBX3.6, channel status interrupted (Page 297)
More information	Function Manual SINUMERIK 828D basic functions

Table 10-128 DB1700.DBX7.7, reset

DB1700.DBX7.7	**Reset** **Signals to PLC: HMI → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The channel is reset. The reset positions are set, e.g. for G functions. The channel alarms are deleted if they are not POWER ON alarms. The "Reset" interface signal must be issued from the PLC, e.g. using a logic operation with the reset key on the MCP. The signal is only evaluated by the selected channel. The program status changes to "Interrupted".	
Signal state 0	No effect.	
See also	Table 10-299 DB3300.DBX3.7, channel status reset (Page 297) Table 10-215 DB3000.DBX0.7, mode group reset (Page 257)	
More information	Function Manual SINUMERIK 828D basic functions	

10.2.2.2 Program selection via lists

Table 10-129 DB1700.DBB1000.7, NC program: Selection

DB1700.DBB1000.7	**NC program: Selection**
Signal flow	PLC → OP
Update	Cyclic
Signal state 1	Selection active
Signal state 0	Selection not active

Table 10-130 DB1700.DBB1001, program selection from the PLC: Index of the program list

DB1700.DBB1001	**Program selection from the PLC: Index of the program list**
Signal flow	PLC → OP
Update	cyclically

DB1700.DBB1001	**Program selection from the PLC: Index of the program list**							
Further information	Preselected programs/workpieces in the PLC program lists can be selected for machining by the NC via the PLC/HMI interface. To specify the program list, its number (index) is output in binary code via control byte DB1700.DBB1001:							
	Bit 7	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
	Always 1							
	DB1900 DBB16 = <number of the program list>							
	Number (binary-coded)		**Number (decimal)**		**Program list**			
	1000 0001		129		User program list (/user/sinumerik/hmi/plc/programlist/**plc_proglist_user.ppl**)			
	1000 0011		131		Manufacturer program list (/oem/sinumerik/hmi/plc/programlist/**plc_proglist_manufacturer.ppl**)			
See also	Table 10-129 DB1700.DBB1000.7, NC program: Selection (Page 219) Table 10-131 DB1700.DBB1002, program selection from the PLC: Program index in the program list (Page 220) Table 10-137 DB1700.DBB2000.7, selection (Page 222) Table 10-138 DB1700.DBB2001, program selection from the PLC: Error code (Page 222) MD9106 $MM_SERVE_EXTCALL_PROGRAMS (Process EXTCALL calls) MD51041 $MN_ENABLE_PROGLIST_USER (Activation of PLC program list, USER area) MD51043 $MN_ENABLE_PROGLIST_MANUFACT (Activation of PLC program list, MANUFACTURER area)							

Table 10-131 DB1700.DBB1002, program selection from the PLC: Program index in the program list

DB1700.DBB1002	**Program selection from the PLC: Program index in the program list**	
Signal flow	PLC → OP	
Update	cyclically	
Further information	Preselected programs/workpieces in the PLC program lists can be selected for machining by the NC via the PLC/HMI interface. To specify the program within the program list selected via DB1700.DBB1001, the program number is output in binary code via control byte DB1700.DBB102.	
	Area	**Program number**
	user	1 - 100
	oem	201 - 255
See also	Table 10-129 DB1700.DBB1000.7, NC program: Selection (Page 219) Table 10-130 DB1700.DBB1001, program selection from the PLC: Index of the program list DB1700.DBB1001 (Page 219) Table 10-138 DB1700.DBB2001, program selection from the PLC: Error code (Page 222) Table 10-137 DB1700.DBB2000.7, selection (Page 222) MD9106 $MM_SERVE_EXTCALL_PROGRAMS (Process EXTCALL calls) MD51041 $MN_ENABLE_PROGLIST_USER (Activation of PLC program list, USER area) MD51043 $MN_ENABLE_PROGLIST_MANUFACT (Activation of PLC program list, MANUFACTURER area)	

Table 10-132 DB1700.DBB2000.1, job completed

DB1700.DBB2000.1	**Job completed**
Signal flow	OP → PLC
Update	cyclically
Signal state 1	Program selection from the PLC: Job completed
Signal state 0	Program selection from the PLC: Job not completed
See also	Table 10-129 DB1700.DBB1000.7, NC program: Selection (Page 219) Program selection via lists (Page 219) Program selection via lists (Page 219) Table 10-137 DB1700.DBB2000.7, selection (Page 222) Table 10-138 DB1700.DBB2001, program selection from the PLC: Error code (Page 222)

Table 10-133 DB1700.DBB2000.2, error

DB1700.DBB2000.2	**Error**
Signal flow	OP → PLC
Update	cyclically
Signal state 1	Program selection from the PLC: Job completed with errors
Signal state 0	Program selection from the PLC: Job completed correctly
See also	Table 10-129 DB1700.DBB1000.7, NC program: Selection (Page 219) Table 10-130 DB1700.DBB1001, program selection from the PLC: Index of the program list DB1700.DBB1001 (Page 219) Table 10-131 DB1700.DBB1002, program selection from the PLC: Program index in the program list (Page 220) Table 10-137 DB1700.DBB2000.7, selection (Page 222) Table 10-138 DB1700.DBB2001, program selection from the PLC: Error code (Page 222)

Table 10-134 DB1700.DBB2000.3, active

DB1700.DBB2000.3	**Active**
Signal flow	OP → PLC
Update	cyclically
Signal state 1	Job active
Signal state 0	No job active
See also	Table 10-129 DB1700.DBB1000.7, NC program: Selection (Page 219) Table 10-130 DB1700.DBB1001, program selection from the PLC: Index of the program list DB1700.DBB1001 (Page 219) Table 10-131 DB1700.DBB1002, program selection from the PLC: Program index in the program list (Page 220) Table 10-137 DB1700.DBB2000.7, selection (Page 222) Table 10-138 DB1700.DBB2001, program selection from the PLC: Error code (Page 222)

Table 10-135 DB1700.DBB2000.5, unload

DB1700.DBB2000.5	**Unload**
Signal flow	OP → PLC
Update	cyclically
Signal state 1	Unload active
Signal state 0	Unload inactive
See also	Table 10-129 DB1700.DBB1000.7, NC program: Selection (Page 219) Table 10-130 DB1700.DBB1001, program selection from the PLC: Index of the program list DB1700.DBB1001 (Page 219) Table 10-131 DB1700.DBB1002, program selection from the PLC: Program index in the program list (Page 220) Table 10-137 DB1700.DBB2000.7, selection (Page 222) Table 10-138 DB1700.DBB2001, program selection from the PLC: Error code (Page 222)

Table 10-136 DB1700.DBB2000.6, unload

DB1700.DBB2000.6	**Load**
Signal flow	OP → PLC
Update	cyclically
Signal state 1	Unload active
Signal state 0	Unload inactive
See also	Table 10-129 DB1700.DBB1000.7, NC program: Selection (Page 219) Table 10-130 DB1700.DBB1001, program selection from the PLC: Index of the program list DB1700.DBB1001 (Page 219) Table 10-131 DB1700.DBB1002, program selection from the PLC: Program index in the program list (Page 220) Table 10-137 DB1700.DBB2000.7, selection (Page 222) Table 10-138 DB1700.DBB2001, program selection from the PLC: Error code (Page 222)

Table 10-137 DB1700.DBB2000.7, selection

DB1700.DBB2000.7	**Selection**
Signal flow	OP → PLC
Update	cyclically
Signal state 1	Selection active
Signal state 0	Selection inactive
See also	Program selection via lists (Page 219) Program selection via lists (Page 219) Program selection via lists (Page 219) Program selection via lists (Page 219)

Table 10-138 DB1700.DBB2001, program selection from the PLC: Error code

DB1700.DBB2001	**Program selection from the PLC: Error code**
Signal flow	OP → PLC
Update	cyclically

DB1700.DBB2001	Program selection from the PLC: Error code	
Further information	Output byte for the error values of the data transfer.	
	Value	**Meaning**
	0	No error
	1	Invalid program list number (DB1700.DBB1001)
	3	User-spec. program list plc_proglist_main.ppl not found (only for DB1700.DBB1001 ≠ 129, 131)
	4	Invalid program number (DB1700.DBB1002)
	5	The job list in the selected workpiece could not be opened.
	6	Error in job list. (Job List Interpreter returns error)
	7	Job list interpreter returns empty job list
See also	Program selection via lists (Page 219) Program selection via lists (Page 219) Program selection via lists (Page 219) Program selection via lists (Page 219) MD9106 $MM_SERVE_EXTCALL_PROGRAMS (Process EXTCALL calls) MD51041 $MN_ENABLE_PROGLIST_USER (Activation of PLC program list, USER area) MD51043 $MN_ENABLE_PROGLIST_MANUFACT (Activation of PLC program list, MANUFACTURER area)	

10.2.2.3 Axis selection

DB1700 DBB4000, axis selection type

Table 10-139 DB1700.DBB4000, axis selection type

DB1700.DBB4000	Axis selection type	
Signal flow	HMI -> PLC	
Update	Value change at the HMI	
Description	Type of axis selected in the operating software. The PLC logic uses this signal for example to determine which interface must be used for traverse requests.	
	Value	**Meaning**
	0	Machine axis
	1	Geo axis
	2	Orientation axis
See also	DB3200.DBX1000.7 and .6, 1004.7 and .6, 1008.7 and .6, plus and minus traversing keys for axes in the WCS (Page 283) DB38xx.DBX4.6 and .7, minus/plus traversing keys (Page 326)	
More information	• Function Manual SINUMERIK 828D Axes and Spindles	

DB1700 DBB4001, axis number

Table 10-140 DB1700.DBB4001, axis number

DB1700.DBB4001	**Axis number**
Signal flow	HMI -> PLC
Update	Value change at the HMI
Description	Number of the axis selected in the operating software (SINUMERIK Operate). **Value** Axis number: machine/geo/orientation axis If SINUMERIK Operate is used, the numbers defined in the channel-specific machine data are transferred.
See also	MD20050[0..2] $MC_AXCONF_GEOAX_ASSIGN_TAB: Assignment of geometry axis to channel axis MD20070[0..19] $MC_AXCONF_MACHAX_USED: Machine axis number valid in channel
More information	• Function Manual SINUMERIK 828D Axes and Spindles

DB1700 DBB4002.0, key axis selection

Table 10-141 DB1700.DBB4002.0, axis selection "key" (touch)

DB1700.DBB4002.0	**Axis selection "key" (touch)**
Signal flow	HMI -> PLC
Update	Value change at the HMI
Description	The check box in the operating software (SINUMERIK Operate) for an axis is activated
Signal state 1	Axis selection "key" (touch) actuated
Signal state 0	Axis selection "key" (touch) not actuated
More information	• Function Manual SINUMERIK 828D Axes and Spindles

DB1700 DBB5000, active axis selection

Table 10-142 DB1700.DBB5000, active axis selection (feedback signal to HMI)

DB1700.DBB5000	**Active axis selection (feedback message to the HMI)**	
Signal flow	PLC -> HMI	
Update	Value change at the HMI	
Description	Type of the axis selected in the PLC logic	
	Value	**Meaning**
	0	Machine axis
	1	Geo axis
	2	Orientation axis

DB1700.DBB5000	Active axis selection (feedback message to the HMI)
See also	DB1700.DBB4000, axis selection type (Page 223) DB1700.DBB5001, active axis number (Page 225) MD20050[0..2] $MC_AXCONF_GEOAX_ASSIGN_TAB: Assignment of geometry axis to channel axis MD20070[0..19] $MC_AXCONF_MACHAX_USED: Machine axis number valid in channel
More information	• Function Manual SINUMERIK 828D Axes and Spindles

DB1700 DBB5001, active axis number

Table 10-143 DB1700.DBB5001, active axis number (feedback signal to HMI)

DB1700.DBB5001	Active axis number (feedback message to the HMI)
Signal flow	PLC -> HMI
Update	Value change at the HMI
Description	Number of the axis selected/used in the PLC logic Used as feedback signal to the operating software and activation of the check box next to the axis name (SINUMERIK Operate). **Value** Active axis number (feedback message to the HMI): machine/geo/orientation axis Significance depends on DB1700.DBB5000, active axis selection (feedback signal to the HMI)
See also	DB1700.DBB5000, active axis selection (feedback signal to HMI) (Page 224) MD20050[0..2] $MC_AXCONF_GEOAX_ASSIGN_TAB: Assignment of geometry axis to channel axis MD20070[0..19] $MC_AXCONF_MACHAX_USED: Machine axis number valid in channel
More information	• Function Manual SINUMERIK 828D Axes and Spindles

10.2.2.4 Signals from HMI

Table 10-144 DB1800.DBX0.0, AUTOMATIC mode

DB1800.DBX0.0	AUTOMATIC mode Signals to PLC: HMI → PLC	
Edge evaluation: Yes	Signal updated: cyclic	
Edge change 0 → 1	AUTOMATIC mode is selected. The signals are only present for one PLC cycle.	
Edge change 1 → 0	AUTOMATIC mode is not selected.	
Signal irrelevant for ...	"Mode change disable" signal	

Table 10-145 DB1800.DBX0.1, MDI mode

DB1800.DBX0.1	**MDI mode** **Signals to PLC: HMI → PLC**	
Edge evaluation: Yes	Signal updated: cyclic	
Edge change 0 → 1	MDI mode is selected. The signals are only present for one PLC cycle.	
Edge change 1 → 0	MDI mode is not selected.	
Signal irrelevant for ...	"Mode change disable" signal.	

Table 10-146 DB1800.DBX0.2, JOG mode

DB1800.DBX0.2	**JOG mode** **Signals to PLC: HMI → PLC**	
Edge evaluation: Yes	Signal updated: cyclic	
Edge change 0 → 1	JOG mode is selected. The signals are only present for one PLC cycle.	
Edge change 1 → 0	JOG mode is not selected.	
Signal irrelevant for ...	"Mode change disable" signal.	

Table 10-147 DB1800.DBX0.7, reset

DB1800.DBX0.7	**Reset** **Signals to PLC: HMI → PLC**	
Edge evaluation: Yes	Signal updated: cyclic	
Edge change 0 → 1	The channel is reset. The initial settings are made (e.g. G functions). The channel alarms are deleted if they are not POWER ON alarms. The "Reset" interface signal must be issued from the PLC, e.g. using a logic operation with the reset key on the MCP. The signal is only evaluated by the selected channel. The program status changes to "Interrupted".	
Edge change 1 → 0	Channel status and program execution are not influenced.	
Special cases, errors, etc.	An alarm that removes the "Ready" signal ensures that the channel is no longer in the reset state. The "Reset" signal must be issued so that the mode can be changed.	
See also	Table 10-224 DB3100.DBX0.3, mode group ready (Page 260)	

Table 10-148 DB1800.DBX1.0, active TEACH IN machine function

DB1800.DBX1.0	**Active TEACH IN machine function** **Signals to PLC: HMI → PLC**	
Edge evaluation: Yes	Signal updated: cyclic	
Edge change 0 → 1	The TEACH IN machine function is selected in JOG mode. The signals are only present for one PLC cycle.	
Edge change 1 → 0	The TEACH IN machine function is not selected in JOG mode.	
Signal irrelevant for ...	JOG mode is not active.	

Table 10-149 DB1800.DBX1.2, active REF machine function

DB1800.DBX1.2	**Active REF machine function** **Signals to PLC: HMI → PLC**	
Edge evaluation: Yes	Signal updated: cyclic	
Edge change 0 → 1	The REF machine function is selected in JOG mode. The signals are only present for one PLC cycle.	
Edge change 1 → 0	The REF machine function is not selected in JOG mode.	
Signal irrelevant for ...	JOG mode is not active.	

10.2.2.5 Signals from the PLC

Table 10-150 DB1800.DBX1000.0, run-up with default values

DB1800.DBX1000.0	**Run-up with default values**	
Edge evaluation: Yes	Signal updated: cyclic	
Meaning	The system loads the Siemens NC data default settings and deletes the retentive data on the PLC.	

Table 10-151 DB1800.DBX1000.1, run-up with saved data

DB1800.DBX1000.1	**Run-up with saved data** **Signals from PLC: HMI → PLC**	
Edge evaluation: Yes	Signal updated: cyclic	
Meaning	The data backup that was previously created with the "Back up data" softkey is loaded. If no data were backed up, the control is started up with the data that were valid before the control was switched off.	

Table 10-152 DB1800.DBX1000.6, commissioning archive was read

DB1800.DBX1000.6	**Commissioning archive was read** **Signals from PLC: HMI → PLC**	
Edge evaluation: Yes	Signal updated: cyclic	
Meaning	The interface signal is set if a commissioning archive or a data class file tree is read in. The signal is only present for one PLC cycle. The PLC then deletes the interface signal.	

10.2.2.6 Signals from the operator panel

DB1900.DBX0.2, Cancel key actuated

Table 10-153 DB1900.DBX0.2, Cancel key actuated

DB1900.DBX0.2	**Cancel key actuated** **Signals from operator panel: OP → PLC**
Update	cyclic
Signal state 1	Cancel key is actuated
Signal state 0	**Note** The interface signal must be reset in the PLC user program.

Table 10-154 DB1900.DBX0.6, simulation active

DB1900.DBX0.6	**Simulation active** **Signals from HMI → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	An NC program has been selected at the user interface and the "Simulation" function activated for this program.	
Signal state 0	The "Simulation" function is not active.	
Signal irrelevant for ...	JOG mode is not active.	
More information	Commissioning Manual SINUMERIK 828D SINUMERIK Operate	

Table 10-155 DB1900.DBX0.7, switch over MCS/WCS

DB1900.DBX0.7	**Switch over MCS/WCS** **Signals from HMI → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The coordinate system is switched over from the workpiece coordinate system (WCS) to the machine coordinate system (MCS). After actuation, the signal is present for one PLC cycle.	
Signal state 0	No effect.	
Application	The "Switch over MCS/WCS" signal must be transferred to the "Actual value in WCS" signal for the switchover to take effective.	
See also	Table 10-168 DB1900.DBX5000.7, actual value in WCS (Page 234)	
More information	Function Manual SINUMERIK 828D basic functions	

Table 10-156 DB1900.DBX3.3, proximity sensor active

DB1900.DBX3.3	Proximity sensor active Signals from HMI → PLC	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The proximity sensor has detected an approach. This signal state lasts for approx. 50 milliseconds. If the approach continues, this signal state is set again after 5 seconds for approx. another 50 milliseconds.	
Signal state 0	If this signal state continues for more than 5 seconds, this means that the proximity sensor has not detected an approach.	
See also	Table 10-165 DB1900.DBX5000.1, screen dark (Page 233)	
More information	Equipment Manual for SINUMERIK 828D PU and components	

DB1900.DBW4, current screen number

Table 10-157 DB1900.DBW4, current screen number

DB1900.DBW4	Current screen number Signals from operator panel: OP → PLC
Update	cyclic
More information	Format: UINT (unsigned, 0 ... 255D or 0 ... FFH) Valid channel numbers: 1 ... maximum number of NC channels

DB1900.DBB11, error code

Table 10-158 DB1900.DBB11, error code

DB1900.DBB11	Error code Signals from operator panel: OP → PLC
Update	cyclic
Description	Error code after completion of the function execution by the NC: • 0: No error • 1: Function number invalid (DBX5021.0 - .5) • 2: Invalid parameter (DBB5022 - DBB5024) • 3: Error when writing the HMI-internal variable. • 10: Channel not present (DBB5022)
Corresponds with	DB1900 DBX5021.0 - 5 (function selection number from PLC) DB1900 DBX5021.6 (strobe function) DB1900 DBX5021.7 (busy function) DB1900 DBB5022 - 5024 (parameters 1 - 3)
More information	Channel selection on the HMI (Page 101)

10.2.2.7 General selection/status signals from HMI

Table 10-159 DB1900.DBX1000.0 to 1002.3, channel number for handwheel 1/2/3 (A, B, C, D)

DB1900.DBX1000.0 to .3 **DB1900.DBX1001.0 to .3** **DB1900.DBX1002.0 to .3**	**Channel number for handwheel 1 (A, B, C, D)** **Channel number for handwheel 2 (A, B, C, D)** **Channel number for handwheel 3 (A, B, C, D)** **Signals from NC: HMI → PLC**				
Edge evaluation: No	Signal updated: cyclic				
Meaning	An axis can be assigned to every handwheel directly on the operator panel. If this axis is a geometry axis (interface signal "Machine axis handwheel <n>" = 0), then the PLC basic program provides the corresponding channel number at the HMI interface as binary-coded value. Example:				
	Bit 3 0	Bit 2 0	Bit 1 1	Bit 0 0	Channel number 2
	Note: For machine axes (interface signal "Machine axis handwheel <n>" = 1), the interface signal "Channel number geometry axis handwheel <n>" has no significance.				
See also	General selection/status signals from HMI (Page 230) General selection/status signals from HMI (Page 230) General selection/status signals from HMI (Page 230) General selection/status signals from HMI (Page 230) MD10000 $MN_AXCONF_MACHAX_NAME_TAB [n]: Machine axis name MD20060 $MC_AXCONF_GEOAX_NAME_TAB [n]: Geometry axis name in the channel				
More information	Function Manual SINUMERIK 828D Axes and Spindles				

Table 10-160 DB1900.DBX1003.0 to 1005.2, axis number for handwheel 1/2/3 (A, B, C)

DB1900.DBX1003.0 to .3 **DB1900.DBX1004.0 to .3** **DB1900.DBX1005.0 to .3**	**Axis number for handwheel 1 (A, B, C, D)** **Axis number for handwheel 2 (A, B, C, D)** **Axis number for handwheel 3 (A, B, C, D)** **Signals from NC: HMI → PLC**			
Edge evaluation: No	Signal updated: cyclic			
Meaning	An axis can be assigned to every handwheel directly on the operator panel. To do this, the required axis is specified, e.g. "X". The axis numbers associated with the axis and the "Machine or geometry axis" information ("Machine axis for handwheel 1/2/3") are provided as signals in the PLC user interface. The "Activate handwheel 1/2/3" signal must be set for the specified axis (e.g. axis 1) from the PLC user program. Depending on the "Machine axis for handwheel 1/2/3" signal, either the interface for the geometry axis or for the machine axis is used. The following applies when assigning the axis identifier to the axis number: • "Machine axis for handwheel 1/2/3" = 1 signal; i.e. machine axis - not geometry axis: The assignment is via MD10000. • "Machine axis for handwheel 1/2/3" = 0 signal; i.e. geometry axis (axis in the WCS): The assignment is via MD20060. With the signal "Channel number geometry axis handwheel n", the channel number assigned to the handwheel is specified. Example:			
	Bit 3 0	Bit 2 1	Bit 1 0	Bit 0 1	Axis number 5
See also	Table DB1900.DBX1003.7 and 1004.7, machine axis for handwheel 1/2/3 (Page 232) Table DB3200.DBX1000.0 to .2, 1004.0 to .2, 1008.0 to .2, activate handwheel 1/2/3 for axes in the WCS (Page 283) Table DB3200.DBX1000.4, 10004.4, 1008.4, traversing key disable for axes in the WCS (Page 284) Table DB3200.DBX1000.3, 1004.3, 1008.3, feed stop for axes in the WCS (Page 284) Table DB380x.DBX4.0 to .2, activate handwheel 1/2/3 (Page 327) MD10000 $MN_AXCONF_MACHAX_NAME_TAB [n]: Machine axis name MD20060 $MC_AXCONF_GEOAX_NAME_TAB [n]: Geometry axis name in the channel			
More information	Function Manual SINUMERIK 828D Axes and Spindles			

Table 10-161 DB1900.DBX1003.5 to 1005.5, define handwheel 1/2/3 as contour handwheel

DB1900.DBX1003.5 **DB1900.DBX1004.5** **DB1900.DBX1005.5**	**Define handwheel 1 as contour handwheel** **Define handwheel 2 as contour handwheel** **Define handwheel 3 as contour handwheel** **Signals from NC: HMI → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The handwheel is defined as contour handwheel via the HMI.	
Signal state 0	The handwheel is not defined as contour handwheel.	
Application	In order that the handwheel defined via the HMI takes effect as contour handwheel, the "Activate handwheel 1/2/3 as contour handwheel" signal must also be set to "1".	
See also	Table DB3200.DBB14.0 and .2, activate handwheel 1/2/3 as contour handwheel (Page 279)	
More information	Function Manual SINUMERIK 828D Axes and Spindles	

Table 10-162 DB1900.DBX1003.6 to 1005.6, handwheel selected for handwheel 1/2/3

DB1900.DBX1003.6 **DB1900.DBX1004.6** **DB1900.DBX1005.6**	**Handwheel selected for handwheel 1** **Handwheel selected for handwheel 2** **Handwheel selected for handwheel 3** **Signals from NC: HMI → PLC**
Edge evaluation: No	Signal updated: cyclic
Signal state 1	The handwheel for the specified axis is selected or set active on the operator panel. The PLC provides this information to the HMI interface. The PLC sets the "Activate handwheel 1/2/3" signal for the specified axis to "1". The associated axis is also displayed at the HMI interface via the "Machine axis for handwheel 1/2/3" signal and the "Axis number for handwheel 1/2/3" signal. As soon as the handwheel is active, the axis can be traversed in JOG mode with the handwheel: "Handwheel active" signal = 1.
Signal state 0	The handwheel for the specified axis is set inactive. The PLC provides this information to the HMI interface. The "Activate handwheel" signal can be set to "0" for the specified axis from the PLC.
See also	Table DB1900.DBX1003.0 to 1005.2, axis number for handwheel 1/2/3 (A, B, C) (Page 231) Table DB1900.DBX1003.7 and 1004.7, machine axis for handwheel 1/2/3 (Page 232) Table DB380x.DBX4.0 to .2, activate handwheel 1/2/3 (Page 327) Table DB3300.DBX1000.0 to .2, 1004.0 to .2, 1008.0 to .2, handwheel 1/2/3 active for axes in the WCS (Page 304) Table DB390x.DBX4.0 to .2, handwheel 1/2/3 active (Page 362)
More information	Function Manual SINUMERIK 828D Axes and Spindles

Table 10-163 DB1900.DBX1003.7 and 1004.7, machine axis for handwheel 1/2/3

DB1900.DBX1003.7 **DB1900.DBX1004.7** **DB1900.DBX1005.7**	**Machine axis for handwheel 1** **Machine axis for handwheel 2** **Machine axis for handwheel 3** **Signals from NC: HMI → PLC**
Edge evaluation: No	Signal updated: cyclic
Signal state 1	An axis is assigned to handwheel 1/2/3 on the operator panel. This axis is a machine axis – no geometry axis (axis in the MCS).
Signal state 0	An axis is assigned to handwheel 1/2/3 on the operator panel. This axis is a geometry axis (axis in the WCS).
See also	Table DB1900.DBX1003.0 to 1005.2, axis number for handwheel 1/2/3 (A, B, C) (Page 231) Table DB380x.DBX4.0 to .2, activate handwheel 1/2/3 (Page 327)
More information	Function Manual SINUMERIK 828D Axes and Spindles

Table 10-164 DB1900.DBB1008.0 - .7, collision avoidance: Deactivate protection area group

DB1900.DBB1008.0 - .7	**Collision avoidance: Deactivate protection area group** **Signals to NC: HMI → PLC**
Edge evaluation: No	Signal updated: cyclic
Signal state 1	The deactivation of all protection areas of the protection area type in the selected operating mode is requested.

DB1900.DBB1008.0 - .7	Collision avoidance: Deactivate protection area group Signals to NC: HMI → PLC		
Signal state 0	The deactivation of all protection areas of the protection area type in the selected operating mode is **not** requested.		
Description	**Bit**	**Mode**	**Protection area type** [1]
	0	AUTOMATIC	Machine
	1		Tool
	2		Workholder
	3		Workpiece
	4	JOG	Machine
	5		Tool
	6		Workholder
	7		Workpiece
	[1] Type of protection area ($NP_PROT_TYPE) **Note** A protection area group is deactivated via the SINUMERIK Operate user interface in the "AUTOMATIC", "JOG" or "MDI" > "ETC key (">")" > "Settings" > "Collision avoidance" > "Switch collision avoidance on and off" operating area by setting the HMI/PLC interface signal DB1900 DBB1008.0 - 7 of the selected protection area group. Depending on the value of the FB1 parameter `MMCToIf`, the interface signal is transferred from the basic PLC program to the NC/PLC interface signal DB2600.DBB2.0 - .7: • "TRUE": Transmission • "FALSE": No transmission The default value of the parameter is "TRUE". **Note** If manual traversing has been enabled in AUTOMATIC mode (MD10735 with bit 0 = 1: allow jogging in automatic mode) the settings for JOG mode also apply in AUTOMATIC mode during manual traversing.		
See also	DB2600.DBX1.6, request switch-on of reduced dynamic response mode (Page 242) $NP_PROT_TYPE (Type of protection area) MD10735 $MN_JOG_MODE_MASK (Settings for JOG mode)		
More information	• Operating Manual SINUMERIK 828D Turning • Operating Manual SINUMERIK 828D Milling • Function Manual SINUMERIK 828D monitoring and compensating		

10.2.2.8 General selection/status signals to HMI

Table 10-165 DB1900.DBX5000.1, screen dark

DB1900.DBX5000.1	Screen dark Signals to channel: HMI → PLC	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The screen is darkened. The display machine data MD9006 $MM_DISPLAY_SWITCH_OFF_INTERVAL is ineffective.	

DB1900.DBX5000.1	**Screen dark** **Signals to channel: HMI → PLC**
Signal state 0	The darkening is performed in two stages: 1. The first stage automatically takes effect after three minutes and dims the brightness value to 20%. 2. In the second stage, the screen is darkened when the time set in the display machine data MD9006 $MM_DISPLAY_SWITCH_OFF_INTERVAL has elapsed.
More information	Equipment Manual for SINUMERIK 828D PPU and Components

Table 10-166 DB1900.DBX5000.2, OP key disable

DB1900.DBX5000.2	**OP key disable** **Signals from PLC → HMI**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The OP keyboard is disabled for the user.	
Signal state 0	The OP keyboard is enabled for the user.	
More information	Function Manual SINUMERIK 828D basic functions	

DB190x.DBX5000.6, back up action log

Table 10-167 DB1900.DBX5000.6, back up action log

DB1900.DBX5000.6	**Back up action log** **Signals from PLC → OP**	
Edge evaluation: Yes	Signal updated: cyclic	
Edge change 0 → 1	Save ACTION.LOG to CRASH.LOG The file ACTION.COM is generated if the action log is activated, i.e. data logging is activated. The file ACTION.COM is a binary file and is always repeatedly overwritten as ring buffer. The most recent results are located at the beginning of the file. An empty binary file CRASH.COM is available. An intermediate status of the log ACTION.COM is saved in file CRASH.COM. Writing is initiated by setting interface signal DB1900.DBX5000.6 or write trigger using an alarm. The content is kept up to the next trigger.	
More information	• Function Manual SINUMERIK 828D basic functions	

Table 10-168 DB1900.DBX5000.7, actual value in WCS

DB1900.DBX5000.7	**Actual value in WCS** **Signals from HMI → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The display of the actual values in the workpiece coordinate system (WCS) is selected from the PLC. This means that when the machine area is selected, the WCS display is activated; i.e. the machine and the special axes as well as their actual positions and distances-to-go are displayed in the WCS in the "Position" window. Since the interface signal is only evaluated when it enters the basic machine screen; it is possible to toggle between the respective coordinate systems using the "Actual MCS values" and "Actual WCS values" softkeys.	

DB1900.DBX5000.7	Actual value in WCS Signals from HMI → PLC
Signal state 0	When the machine area is selected, the coordinate system previously selected (WCS or MCS) is reactivated and displayed.
See also	Table 10-155 DB1900.DBX0.7, switch over MCS/WCS (Page 228)
More information	Function Manual SINUMERIK 828D basic functions

DB1900 DBB5009.0 to .2, handwheel active

Table 10-169 DB1900.DBB5009.0 to .2, handwheel active

DB1900.DBB5009.0 to .2	Axis selection type	
Signal flow	HMI -> PLC	
Update	cyclic	
Description	Handwheel active The button for the handwheel in the HMI is operated on the HT10 (TRUE). One signal is available for each handwheel:	
	Bit	**Meaning**
	0	Handwheel 1
	1	Handwheel 2
	2	Handwheel 3
	From the PLC side, the handwheel assignment can be canceled or locked by writing false to the signals in DBB5009.	
More information	• Function Manual SINUMERIK 828D Axes and Spindles	

DB1900.DBB5022 to 5024, parameters 1 - 3 for selection number

Table 10-170 DB1900.DBB5022 to 5024, function selection from PLC: Parameters 1 to 3

DB1900.DBB5022 to 5024	Function selection from the PLC: Parameters 1 to 3 General selection/status signals to HMI: PLC → OP
Update	cyclic
More information	For the function requested in DB1900.DBB5021, parameters can be specified: • Parameter 1: DB1900.DBB5022 • Parameter 2: DB1900.DBB5023 • Parameter 3: DB1900.DBB5024 The number and value range of the parameters depends on the associated function.
Corresponds with	DB1900.DBX5021.0 to 5 (function selection number from PLC) DB1900.DBX5021.6 (strobe function) DB1900.DBX5021.7 (busy function)
More information	Channel selection on the HMI (Page 101)

10.2.3 Auxiliary function transfer from the NC channel

10.2.3.1 M, S, T, D, H functions

Table 10-171 DB2500.DBX4.0 to .4 to DBX12.0 to .2, M/S/T/D/H functions 1 to 5 change

DB2500.DBX4.0 to .4 **DB2500.DBX6.0 to .2** **DB2500.DBX8.0** **DB2500.DBX10.0** **DB2500.DBX12.0 to .2**	**M functions 1 to 5 change** **S functions 1 to 3 change** **T function 1 change** **D function 1 change** **H functions 1 to 3 change** **Signals from NC channel: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	M, S, T, D, H information is output at the interface together with a new value and the associated change signal. In this case, the change signal indicates that the appropriate value is valid. The change signals are only valid for one PLC cycle! This means that if the signal is "1", then a change is active for the cycle.	
Signal state 0	The value of the respective data is not valid.	
More information	Function Manual SINUMERIK 828D Basic Functions	

10.2.3.2 Decoded M signals

Table 10-172 DB2500.DBB1000 to DBB1012, decoded M signals: M0 - M99

DB2500.DBB1000 to DBB1012	**Decoded M signals: M0 - M99** **Signals from NC channel: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The dynamic M signal bits are set by decoded M functions.	
Signal state 0	For a general auxiliary function output, the dynamic M signal bits are acknowledged by the PLC system program after the user program has been completely run-through (executed once).	
Application	Spindle clockwise/counterclockwise rotation, switch coolant ON/OFF	
See also	Table 10-338 DB370x.DBD0, M function for spindle (DINT) (Page 313)	
More information	Function Manual SINUMERIK 828D basic functions	

10.2.3.3 Transferred T functions

Table 10-173 DB2500.DBD2000, T function 1

DB2500.DBD2000	T function 1 Signals from NC channel: NC → PLC
Edge evaluation: No	Signal updated: Job-controlled by the NC
Signal state 1	The T function programmed in an NC block is provided as soon as the T function change signal is present. Value range of the T function: 0 - 32000; integers The T function remains valid until it is overwritten by a new T function.
Signal state 0	• After the PLC has run up. • All auxiliary functions are deleted before a new function is entered.
Application	Control of the automatic tool selection.
Special cases, errors, etc.	With T0, the current tool is removed from the toolholder, but not replaced by a new tool (default configuration of the machine manufacturer).
More information	Function Manual SINUMERIK 828D basic functions

10.2.3.4 Transferred M functions

Table 10-174 DB2500.DBD3000 to DBD3036, M functions 1 to 5, extended address, M functions 1 to 5

DB2500.DBD3000 DB2500.DBD3008 DB2500.DBD3016 DB2500.DBD3024 DB2500.DBD3032 DB2500.DBD3004 DB2500.DBD3012 DB2500.DBD3020 DB2500.DBD3028 DB2500.DBD3036	M function 1 M function 2 M function 3 M function 4 M function 5 Extended address, M function 1 Extended address, M function 2 Extended address, M function 3 Extended address, M function 4 Extended address, M function 5 Signals from channel: NC → PLC
Edge evaluation: No	Signal updated: Job-controlled from the NC
Signal state 1	Up to five M functions programmed in an NC block are provided simultaneously as soon as the M change signals are present. Value range of the M functions: 0 to 99; integers Value range of the extended address: 1 - 2; integers (spindle number) The M functions remain valid until they are overwritten by new M functions.
Signal state 0	• After the PLC has run up. • All auxiliary functions are deleted before a new function is entered.
Application	Control of the automatic tool selection.
See also	Table 10-338 DB370x.DBD0, M function for spindle (DINT) (Page 313)
More information	Function Manual SINUMERIK 828D basic functions

10.2.3.5 Transferred S functions

Table 10-175 DB2500.DBD4000 to DBD4020, S function 1/2/3, extended address, S function 1/2/3

DB2500.DBD4000 **DB2500.DBD4008** **DB2500.DBD4016** **DB2500.DBD4004** **DB2500.DBD4012** **DB2500.DBD4020**	**S function 1** **S function 2** **S function 3** **Extended address, S function 1** **Extended address, S function 2** **Extended address, S function 3** **Signals from channel NC → PLC**
Edge evaluation: No	Signal updated: Job-controlled from the NC
Signal state 1	An S function programmed in an NC block (speed or cutting value for G96) is provided as soon as the S change signal is present. Value range of the S function: Floating-point number (REAL format / 4-byte) Value range of the extended address: 1 ... 3; integers (spindle number) The S function remains valid until it is overwritten by a new S function.
Signal state 0	• After the PLC has run up. • All auxiliary functions are deleted before a new function is entered.
Application	Control of the automatic tool selection.
See also	Table 10-339 DB370x.DBD4, S function for spindle (REAL) (Page 314)
More information	Function Manual SINUMERIK 828D basic functions

10.2.3.6 Transferred D functions

Table 10-176 DB2500.DBD5000, D function 1

DB2500.DBD5000	**D function 1** **Signals from channel: NC → PLC**
Edge evaluation: No	Signal updated: cyclic
Signal state 1	The D function programmed in an NC block is provided as soon as the D change signal is present. Value range of the D function: 0 - 9; integers The D function remains valid until it is overwritten by a new D function.
Signal state 0	• After the PLC has run up. • All auxiliary functions are deleted before a new function is entered.
Application	D0 is reserved for deselecting the current tool offset.
More information	Function Manual SINUMERIK 828D basic functions

10.2.3.7 Transferred H functions

Table 10-177 DB2500.DBD6000 to 6020, H function 1/2/3, extended address, H function 1/2/3

DB2500.DBD6000 **DB2500.DBD6008** **DB2500.DBD6016** **DB2500.DBD6004** **DB2500.DBD6012** **DB2500.DBD6020**	**H function 1** **H function 2** **H function 3** **Extended address, H function 1** **Extended address, H function 2** **Extended address, H function 3** **Signals from channel: NC → PLC**
Edge evaluation: No	Signal updated: Job-controlled from the NC
Signal state 1	Up to three H functions programmed in an NC block are provided simultaneously as soon as the H change signals are present. Value range of the H function: Floating-point number (REAL format / 4-byte) Value range of the extended address: 0 to 99; integers The H functions remain valid until they are overwritten by new H functions.
Signal state 0	• After the PLC has run up. • All auxiliary functions are deleted before a new function is entered.
Application	Switching functions on the machine.
More information	Function Manual SINUMERIK 828D basic functions

10.2.4 NC signals

10.2.4.1 General signals to the NC

Table 10-178 DB2600.DBX0.1, emergency stop

DB2600.DBX0.1	**Emergency stop** **Signals to NC: PLC → NC**
Edge evaluation: No	Signal updated: cyclic
Signal state 1	The NC is brought into the "Emergency stop" state and the "Emergency stop" sequence started in the NC.
Signal state 0	The NC is not in the "Emergency stop" state. The "Emergency stop" state is still active, but can be reset with the "Acknowledge emergency stop" signal and the "Reset" signal.
See also	Table 10-179 DB2600.DBX0.2, acknowledge emergency stop (Page 240) Table 10-185 DB2700.DBX0.1, emergency stop active (Page 243) Table 10-215 DB3000.DBX0.7, mode group reset (Page 257)
More information	Function Manual SINUMERIK 828D basic functions

Table 10-179 DB2600.DBX0.2, acknowledge emergency stop

DB2600.DBX0.2	**Acknowledge emergency stop** **Signals to NC: PLC → NC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The "Emergency stop" state is only reset if the "Acknowledge emergency stop" signal is first set and then the "Reset" signal. Note that the "Acknowledge emergency stop" signal and the "Reset" signal must remain set together at least until the "Emergency stop active" signal has been reset. Resetting the "Emergency stop" state has the following effect: • The "Emergency stop active" signal is reset • The controller enable is connected • The "Position control active" signal is set • The "828 ready" signal is set • Alarm 3000 is deleted • The part program processing is aborted	
Signal state 0	The NC is not in the "Emergency stop" state. The "Emergency stop" state is still active, but can be reset with the "Acknowledge emergency stop" signal and the "Reset" signal.	
See also	Table 10-178 DB2600.DBX0.1, emergency stop (Page 239) Table 10-185 DB2700.DBX0.1, emergency stop active (Page 243) Table 10-215 DB3000.DBX0.7, mode group reset (Page 257)	
More information	Function Manual SINUMERIK 828D basic functions	

DB2600.DBX0.4 to .7, protection level: Key-operated switch position 0 to 3

Table 10-180 DB2600.DBX0.4 to .7, key-operated switch positions 0 to 3

DB2600.DBX0.4 to .7	**Key-operated switch position 0 to 3** **General signals to the NC: PLC → NC**
Update	cyclic
More information	Depending on the key-operated switch position, access to certain elements in the NC can be enabled or disabled. • Key-operated switch position 0 represents the lowest access rights • Key-operated switch position 3 represents the highest access rights The interface signals of key-operated switch positions 1 to 3 can either be directly specified from the key-operated switch on the machine control panel or from the PLC user program. It is only permissible to set one bit. If several bits are set simultaneously, the control internally activates switch position 3.

Key-operated switch position	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**
0	0	0	0	1
1	0	0	1	0
2	0	1	0	0
3	1	0	0	0

Corresponds with ...	Machine data for access levels: MD11612, MD51044 to MD51064, MD51070 to MD51073, MD51199 to MD51211, MD51215 to MD51225, MD51235 Disabling using a password

Table 10-181 DB2600.DBX1.0, INC inputs in the mode signal range active

DB2600.DBX1.0	**INC inputs in the mode signal range active** **Signals to NC: PLC → NC**
Edge evaluation: No	Signal updated: Job-controlled from the NC
Signal state 1	The "Machine function INC1, ..., continuous" signals in the mode range are used as input signals.
Signal state 0	The "Machine function INC1, ..., continuous" signals in the axis and geometry axis range are used as input signals.
See also	Table 10-275 DB3200.DBX1001.0 to .6, 1005.0 to .6, 1009.0 to .6, machine functions INC1 to INCvar (Page 287) Table 10-220 DB3000.DBX2.0 to .6, machine functions INC1, INC10, INC100, INC1000, INC10000, INCvar, continuous (Page 259) Table 10-362 DB380x.DBX5.0 to .6, machine functions INC1 ... INCvar (Page 330)
More information	Function Manual SINUMERIK 828D Basic Functions

DB2600.DBX1.6, request switch-on of reduced dynamic response mode

Table 10-182 DB2600.DBX1.6, request switch-on of reduced dynamic response mode

DB2600.DBX1.6	**Request switch-on of reduced dynamic response mode** **Signals to NC: PLC → NC**	
Edge evaluation: No	Signal updated: Job-controlled from the NC	
Signal state 1	Request switch-on of reduced dynamic response mode	
Signal state 0	Request switch-off of reduced dynamic response mode	
More information	Function Manual SINUMERIK 828D basic functions	

Table 10-183 DB2600.DBB002.0 - .7, collision avoidance: Deactivate protection area group

DB2600.DBB0002.0 - .7	**Collision avoidance: Deactivate protection area group** **Signals to NC: PLC → NC**		
Edge evaluation: No	Signal updated: cyclic		
Signal state 1	The deactivation of all protection areas of the protection area type in the selected mode is requested.		
Signal state 0	The deactivation of all protection areas of the protection area type in the selected mode is **not** requested.		
Description	**Bit**	**Mode**	**Protection area type**[1)]
	0	AUTOMATIC	Machine
	1		Tool
	2		Workholder
	3		Workpiece
	4	JOG	Machine
	5		Tool
	6		Workholder
	7		Workpiece
	[1)] Type of protection area ($NP_PROT_TYPE) **Note** A protection area group is deactivated via the SINUMERIK Operate user interface in the "AUTOMATIC", "JOG" or "MDI" > "ETC key (">")" > "Settings" > "Collision avoidance" > "Switch collision avoidance on and off" operating area by setting the HMI/PLC interface signal DB1900.DBX1008.0 - 7 of the selected protection area group. Depending on the value of the FB1 parameter `MMCToIf`, the interface signal is transferred from the PLC basic program to the NC/PLC interface signal DB2600.DBB2.0 - .7: • "TRUE": Transmission • "FALSE": No transmission The default value of the parameter is "TRUE". **Note** If manual traversing has been enabled in AUTOMATIC mode (MD10735 with bit 0 = 1: allow jogging in automatic mode) the settings for JOG mode also apply in AUTOMATIC mode during manual traversing.		

DB2600.DBB0002.0 - .7	**Collision avoidance: Deactivate protection area group** **Signals to NC: PLC → NC**
See also	DB1900 DBX1008.0 ... 7 Table 10-164 DB1900.DBB1008.0 - .7, collision avoidance: Deactivate protection area group (Page 232) $NP_PROT_TYPE (Type of protection area) MD10735 $MN_JOG_MODE_MASK (Settings for JOG mode)
More information	• Programming Manual SINUMERIK 828D Turning • Programming Manual SINUMERIK 828D Milling • Function Manual SINUMERIK 828D Monitoring and Compensating

Table 10-184 DB2600.DBX0004.0 - 0011.7, collision avoidance: Activate protection area

DB2600.DBX0004.0 - 0011.7	**Collision avoidance: Activate protection area** **Signals: PLC → NC**							
Edge evaluation: No	Signal updated: cyclic							
Signal state 1	Request to activate the protection areas that are connected to the interface signal.							
Signal state 0	Request to deactivate the protection areas that are connected to the interface signal.							
Description	The assignment protection area ↔ interface signal (<Byte>.<Bit>) is realized by appropriately parameterizing the system variables $NP_BIT_NO:$NP_BIT_NO[<Protection area>] = <Bit number>							
	Byte	Bit						
		7	**6**	**5**	**4**	**3**	**2**	**1**	**0**
		Bit number							
	0004	7	6	5	4	3	2	1	0
	0005	15	14	13	12	11	10	9	8
	0006	23	22	21	20	19	18	17	16
	0007	31	30	29	28	27	26	25	24
	0008	39	38	37	36	35	34	33	32
	0009	47	46	45	44	43	42	41	40
	0010	55	54	53	52	51	50	49	48
	0011	63	62	61	60	59	58	57	56
See also	Table 10-194 DB2700.DBX0020.0 - 0027.7, collision avoidance: Protection area active (Page 246) System variable $NP_BIT_NO (number of the interface bit for switchover activated)							
More information	• Programming Manual SINUMERIK 828D Turning • Programming Manual SINUMERIK 828D Milling • Function Manual SINUMERIK 828D monitoring and compensating							

10.2.4.2 General signals from the NC

Table 10-185 DB2700.DBX0.1, emergency stop active

DB2700.DBX0.1	**Emergency stop active** **Signals from NC: NC → PLC**
Edge evaluation: No	Signal updated: cyclic
Signal state 1	The NC is in the "Emergency stop" state.

DB2700.DBX0.1	**Emergency stop active** **Signals from NC: NC → PLC**
Signal state 0	The NC is not in the "Emergency stop" state.
See also	Table 10-178 DB2600.DBX0.1, emergency stop (Page 239) Table 10-179 DB2600.DBX0.2, acknowledge emergency stop (Page 240)
More information	Function Manual SINUMERIK 828D basic functions

Table 10-186 DB2700.DBX1.0 and .1, probe actuated

DB2700.DBX1.0 and .1	**Probe actuated** **Signals from NC: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	Probe 1 or 2 is actuated.	
Signal state 0	Probe 1 or 2 is not actuated.	

Table 10-187 DB2700.DBX1.7, inch measuring system

DB2700.DBX1.7	**Inch measuring system** **Signals from NC: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The NC operates with the inch measuring system.	
Signal state 0	The NC operates with the metric measuring system.	
More information	Function Manual SINUMERIK 828D Axes and Spindles	

Table 10-188 DB2700.DBX2.3, HMI ready

DB2700.DBX2.3	**HMI ready** **Signals from NC: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The CPU is ready and signals cyclically to the NC.	
Signal state 0	The CPU is not ready.	
More information	Function Manual SINUMERIK 828D basic functions	

DB2700.DBX2.5, drives in cyclic operation

Table 10-189 DB2700.DBX2.5, drives in cyclic operation

DB2700.DBX2.5	**Drives in cyclic operation** **General signals from NC: NC → PLC**
Update	cyclic
Signal state 1	For all machine axes of the NC, the corresponding drives are in cyclic operation, i.e. they cyclically exchange PROFIdrive telegrams with the NC.
Signal state 0	For at least one machine axis of the NC, the corresponding drive is not in cyclic operation, i.e. it is not cyclically exchanging PROFIdrive telegrams with the NC.

Table 10-190 DB2700.DBX2.6, drive ready

DB2700.DBX2.6	**Drive ready** **Signals from NC: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	All available drives signal the "Drive ready" state. Summary of the axial "DRIVE ready" signals.	
Signal state 0	As soon as the drive not ready state is signaled from a drive, i.e. "DRIVE ready" signal = 0.	
See also	Table 10-466 DB390x.DBX4001.5, drive ready (Page 381)	
More information	Function Manual SINUMERIK 828D basic functions	

Table 10-191 DB2700.DBX2.7, NC ready

DB2700.DBX2.7	**NC ready** **Signals from NC: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The control is ready. This interface signal is an image of the "NC ready" relay contact and is set as follows: • "NC ready" relay contact is closed • All control-internal voltages have been built up • The control is in cyclic operation	
Signal state 0	The control is not ready. Relay contact "NC ready" is open. The following faults will cause "NC ready" to be cancelled: • Undervoltage or overvoltage monitoring function has responded • Individual components are not ready (NC CPU ready) • NC CPU watchdog If the "NC ready" signal = 0, the following measures are started by the control if they are still possible: • The enable signals from the control are removed and therefore the drive stopped • The following measures are started by the PLC user program: – Status signals from the NC to the PLC (user interface) are deleted – Change signals for the auxiliary functions are deleted – Cyclic processing of the user interface is terminated The control is not ready again until after POWER ON.	
More information	Function Manual SINUMERIK 828D basic functions	

Table 10-192 DB2700.DBX3.0, NC alarm is present

DB2700.DBX3.0	**NC alarm is present** **Signals from NC: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	At least one NC alarm is present. The "Channel-specific NC alarm is present" signal is a group signal for the signals of all available channels.	
Signal state 0	No NC alarm is present.	

DB2700.DBX3.0	**NC alarm is present** **Signals from NC: NC → PLC**
See also	Table 10-303 DB3300.DBX4.6, channel-specific NC alarm is present (Page 299) Table 10-304 DB3300.DBX4.7, NC alarm with processing stop present (Page 299) DB330x.DBX4.5, channel ready (Page 298)
More information	Function Manual SINUMERIK 828D basic functions

Table 10-193 DB2700.DBX3.6, air temperature alarm

DB2700.DBX3.6	**Air temperature alarm** **Signals from NC: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The temperature monitoring identifies an ambient temperature that is too high, e.g. 60° C. Alarm 2110 "NC temperature alarm" is displayed.	
Signal state 0	The temperature monitoring does not respond.	
More information	Function Manual SINUMERIK 828D basic functions	

Table 10-194 DB2700.DBX0020.0 - 0027.7, collision avoidance: Protection area active

DB2700.DBX0020.0 - 0027.7	**Collision avoidance: Protection area active** **Signals: NC → PLC**							
Edge evaluation: No	Signal updated: cyclic							
Signal state 1	The protection area connected to the interface signal is active. If **several** protection areas are connected to the interface signal: All protection areas are active.							
Signal state 0	The protection area connected to the interface signal is **not** active. If **several** protection areas are connected to the interface signal: At least one protection area is **not** active.							
Description	The assignment protection area ↔ interface signal (<Byte>.<Bit>) is realized by appropriately parameterizing system variables $NP_BIT_NO: $NP_BIT_NO[<Protection area>] = <Bit number>							
	Byte	Bit							
		7	**6**	**5**	**4**	**3**	**2**	**1**	**0**
		Bit number							
	0020	7	6	5	4	3	2	1	0
	0021	15	14	13	12	11	10	9	8
	0022	23	22	21	20	19	18	17	16
	0023	31	30	29	28	27	26	25	24
	0024	39	38	37	36	35	34	33	32
	0025	47	46	45	44	43	42	41	40
	0026	55	54	53	52	51	50	49	48
	0027	63	62	61	60	59	58	57	56
See also	Table 10-184 DB2600.DBX0004.0 - 0011.7, collision avoidance: Activate protection area (Page 243) System variable $NP_BIT_NO (number of the interface bit for switchover activated)							
More information	• Function Manual SINUMERIK 828D monitoring and compensating							

10.2.4.3 Signals to fast inputs and outputs

DB2800.DBX0.0 to .7, disabling of digital NC inputs 1 to 8

Table 10-195 DB2800.DBX0.0 to .7, digital NC inputs 1 to 8: Lock

DB2800.DBX0.0 to .7	**Digital NC inputs 1 to 8: Lock** **Fast signals to NC: PLC → NC**							
Update	cyclic							
Signal state 1	The digital NC input is locked.							
Signal state 0	The digital NC input is enabled.							
Description	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
	Input 8 [2]	Input 7 [2]	Input 6 [2]	Input 5 [2]	Input 4 [1]	Input 3 [1]	Input 2 [1]	Input 1 [1]
	1) Onboard inputs of the NCU 2) Inputs without hardware							
	Note When read, a locked input supplies a value of 0.							
Corresponds with	DB2800.DBX0000, 1000 (digital NC inputs 1 to 8: Lock) DB2800.DBB0001, 1001 (digital NC inputs 1 to 8: Set) DB2900.DBB0000, 1000 (digital NC inputs 1 to 8: Actual value) MD10350 $MN_FASTIO_DIG_NUM_INPUTS							
More information	• Function Manual SINUMERIK 828D basic functions							

DB2800.DBX1.0 to .7, setting of digital NC inputs 1 to 8

Table 10-196 DB2800.DBX1.0 to .7, digital NC inputs 1 to 8: Set

DB2800.DBX1.0 to .7	**Digital NC inputs 1 to 8: Set** **Fast signals to NC: PLC → NC**							
Update	cyclic							
Signal state 1	Set NC input value to a defined value of 1.							
Signal state 0	Do not influence NC input value.							
Description	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
	Input 8 [2]	Input 7 [2]	Input 6 [2]	Input 5 [2]	Input 4 [1]	Input 3 [1]	Input 2 [1]	Input 1 [1]
	1) Onboard inputs of the NCU 2) Inputs without hardware							
	If the PLC user program sets the NC input to a value of 1, then the signal state at the onboard input of the NCU - as well as the lock of the NC input - have no effect.							
Corresponds with	DB2800.DBB0000, 1000 (digital NC inputs 1 to 8: Lock) DB2800.DBB0001, 1001 (digital NC inputs 1 to 8: Set) DB2900.DBB0000 (digital NC inputs 1 to 8: Actual value) MD10350 $MN_FASTIO_DIG_NUM_INPUTS							
More information	• Function Manual SINUMERIK 828D basic functions							

DB2800.DBX4.0 to .7, disabling of digital NC outputs 1 to 8

Table 10-197 DB2800.DBX4.0 to .7, digital NC outputs 1 to 8: Lock interface signals Digital NC outputs 1 to 8: Lock

DB2800.DBX4.0 to .7	**Digital NC outputs 1 to 8: Lock** **Fast signals to NC: PLC → NC**							
Update	cyclic							
Signal state 1	The digital NC output is locked.							
Signal state 0	The digital NC output is enabled.							
Description	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
	Output 8	Output 7	Output 6	Output 5	Output 4	Output 3	Output 2	Output 1
	If the digital NC output is locked, then 0 V (defined) is output at the hardware output. If the digital NC output is not locked, then the value specified in the NC program or by the PLC user program is output at the hardware output.							
Corresponds with	DB2800.DBB5, 1009 (digital NC outputs 1 to 8: Overwrite screen form) DB2800.DBB6, 1010 (Digital NC outputs: Setting value from the PLC) DB2800.DBB7, 1011 (digital NC outputs: Target screen form) MD10360 $MN_FASTIO_DIG_NUM_OUTPUTS							
More information	• Function Manual SINUMERIK 828D Basic Functions							

DB2800.DBX5.0 to .7, overwrite mask of digital NC outputs 1 to 8

Table 10-198 DB2800.DBX5.0 to .7, digital NC outputs 1 to 8: Overwrite

DB2800.DBX5.0 to .7	**Digital NC outputs 1 to 8: Overwrite** **Fast signals to NC: PLC → NC**							
Update	cyclic							
Edge change 0 → 1	The associated "setting value" is activated.							
Edge change 1 → 0	No effect.							
More information	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
	Output 8	Output 7	Output 6	Output 5	Output 4	Output 3	Output 2	Output 1
	For a positive edge change 0 → 1, then for the corresponding output, instead of the value written using system variables $A_OUT, the setting value specified from the PLC user program is used. The value written via system variables $A_OUT is then lost. For a negative edge change 1 → 0, for the corresponding output, the actual value at the hardware output is kept.							
	Note The NC/PLC interface DBB6 (digital NC outputs: setting value) is jointly used by: • DB2800.DBB5 (overwrite) with edge change 0 → 1 • DB2800.DBB7 (target) for signal state 1 Activating the two interfaces simultaneously should be avoided.							

DB2800.DBX5.0 to .7	**Digital NC outputs 1 to 8: Overwrite** **Fast signals to NC: PLC → NC**
Corresponds with	DB2800.DBB4, 1008 (Digital NC outputs: Lock) DB2800.DBB5, 1009 (digital NC outputs 1 to 8: Overwrite) DB2800.DBB6, 1010 (Digital NC outputs: Setting value from the PLC) MD10360 $MN_FASTIO_DIG_NUM_OUTPUTS
More information	Function Manual Basic Functions

DB2800.DBX6.0 to .7, setting value of digital NC outputs 1 to 8

Table 10-199 DB2800.DBX6.0 to .7, digital NC outputs 1 to 8: Setting value

DB2800.DBX6.0 to .7	**Digital NC outputs 1 to 8: Setting value** **Fast signals to NC: PLC → NC**							
Update	cyclic							
Signal state 1	Value of the setting value is 1.							
Signal state 0	Value of the setting value is 0.							
Description	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
	Output 8	Output 7	Output 6	Output 5	Output 4	Output 3	Output 2	Output 1
	Using the setting value, the PLC user program can specify a defined output value. In order that the setting value becomes active, it must be activated from the overwrite screen form or the setting screen form.							
	Note The NC/PLC interface DBB6 (digital NC outputs: setting value) is jointly used by: • DB2800.DBB5 (overwrite) with edge change 0 → 1 • DB2800.DBB7 (target) for signal state 1 Activating the two interfaces simultaneously should be avoided.							
Corresponds with	DB2800.DBB4, 1008 (Digital NC outputs: Lock) DB2800.DBB5, 1009 (digital NC outputs 1 - 8: Overwrite) DB2800.DBB6, 1010 (Digital NC outputs: Setting value from the PLC) MD10360 $MN_FASTIO_DIG_NUM_OUTPUTS							
More information	• Function Manual SINUMERIK 828D basic functions							

DB2800.DBX7.0 to .7, input mask of digital NC outputs 1 to 8

Table 10-200 DB2800DBX7.0 to .7, digital NC outputs 1 to 8: Default

DB2800DBX7.0 to .7	**Digital NC outputs 1 - 8: Default** **Fast signals to NC: PLC → NC**
Update	cyclic
Signal state 1	The target is active.
Signal state 0	The target is **not** active.

DB2800DBX7.0 to .7	**Digital NC outputs 1 - 8: Default** **Fast signals to NC: PLC → NC**							
More information	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
	Output 8	Output 7	Output 6	Output 5	Output 4	Output 3	Output 2	Output 1
	If a bit is set, then for the corresponding output, instead of the NC output value, the setting value specified by the PLC user program is used. The actual NC output value is kept. If a bit is reset, then for the corresponding output, the last NC output value becomes active again.							
	Note The NC/PLC interface DBB6 (digital NC outputs: setting value) is jointly used by: • DB2800.DBB5 (overwrite) with edge change 0 → 1 • DB2800.DBB7 (target) for signal state 1 Activating the two interfaces simultaneously should be avoided.							
Corresponds with	DB2800.DBB4, 1008 (Digital NC outputs: Lock) DB2800.DBB5, 1009 (digital NC outputs 1 - 8: Overwrite) DB2800.DBB6, 1010 (Digital NC outputs: Setting value from the PLC) MD10360 $MN_FASTIO_DIG_NUM_OUTPUTS							
More information	• Function Manual SINUMERIK 828D basic functions							

DB2800.DBX1000.0 to .7, disabling of external digital NC inputs 9 to 16

Table 10-201 DB2800.DBB1000.0 to .7, digital NC inputs 9 to 16: Lock

DB2800.DBB1000.0 to .7	**Digital NC inputs 9 to 16: Lock** **Fast signals to NC: PLC → NC**							
Update	cyclic							
Signal state 1	The digital NC input is locked.							
Signal state 0	The digital NC input is enabled.							
More information	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
	Input 16	Input 15	Input 14	Input 13	Input 12	Input 11	Input 10	Input 9
	Note When read, a locked input supplies a value of 0.							
Corresponds with	DB2800.DBB1, 1001 (setting of digital NC inputs from PLC) DB2900.DBB0, 1000 (actual value of digital NC inputs) MD10350 $MN_FASTIO_DIG_NUM_INPUTS							
More information	• Function Manual SINUMERIK 828D basic functions							

DB2800.DBX1001.0 to .7, setting the external digital NC inputs 9 to 16

Table 10-202 DB2800.DBX1001.0 to .7, digital NC inputs 9 - 16: Set

DB2800.DBX1001.0 to .7	**Digital NC inputs 9 - 16: Set** **Fast signals to NC: PLC → NC**							
Update	cyclic							
Signal state 1	Set NC input value to a defined value of 1.							
Signal state 0	Do not influence NC input value.							
More information	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
	Input 16	Input 15	Input 14	Input 13	Input 12	Input 11	Input 10	Input 9
	If the PLC user program sets the NC input to a value of 1, then the signal state at the onboard input of the NCU - as well as the lock of the NC input - have no effect.							
Corresponds with	DB2800.DBB0, 1000 (digital NC inputs 1 to 8: Lock) DB2800.DBB1, 1001 (digital NC inputs 1 to 8: Set) DB2900.DBB0, 1000 (digital NC inputs 1 to 8: Actual value) MD10350 $MN_FASTIO_DIG_NUM_INPUTS							
More information	• Function Manual SINUMERIK 828D basic functions							

DB2800.DBX1008.0 to .7, disabling of digital NC outputs 9 to 16

Table 10-203 DB2800.DBX1008.0 to .7, **digital NC outputs 9 to 16: Lock**

DB2800.DBX1008.0 to .7	**Digital NC outputs 9 to 16: Lock** **Fast signals to NC: PLC → NC**							
Update	cyclic							
Signal state 1	The digital NC output is locked.							
Signal state 0	The digital NC output is enabled.							
More information	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
	Output 16	Output 15	Output 14	Output 13	Output 12	Output 11	Output 10	Output 9
	If the digital NC output is locked, then 0 V (defined) is output at the hardware output. If the digital NC output is not locked, then the value specified in the NC program or by the PLC program is output at the hardware output.							
Corresponds with	DB2800.DBB5, 1009 (digital NC outputs 1 to 8: Overwrite) DB2800.DBB6, 1010 (Digital NC outputs: Setting value from the PLC) DB2800.DBB7, 1011 (digital NC outputs: Target screen form) MD10360 $MN_FASTIO_DIG_NUM_OUTPUTS							
More information	• Function Manual SINUMERIK 828D basic functions							

DB2800.DBX1009.0 to .7, overwrite mask of digital outputs 9 to 16

Table 10-204 DB2800.DBX1009 .0 to .7, digital NC outputs 9 to 16: Overwrite

DB2800.DBX1009 .0 to .7	**Digital NC outputs 9 to 16: Overwrite** **Fast signals to NC: PLC → NC**							
Update	cyclic							
Edge change 0 → 1	The associated "setting value" is activated.							
Edge change 1 → 0	No effect.							
More information	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
	Output 16	Output 15	Output 14	Output 13	Output 12	Output 11	Output 10	Output 9
	For a positive edge change 0 → 1, then for the corresponding output, instead of the value written using system variables $A_OUT, the setting value specified from the PLC user program is used. The value written via system variables $A_OUT is then lost. For a negative edge change 1 → 0, for the corresponding output, the actual value at the hardware output is kept.							
	Note The NC/PLC interface DBB6, ... (Digital NC outputs: setting value) is jointly used by: • DB2800.DBB5 (overwrite) with edge change 0 → 1 • DB2800.DBB7 (target) for signal state 1 Activating the two interfaces simultaneously should be avoided.							
Corresponds with	DB2800.DBB4, 1008 (Digital NC outputs: Lock) DB2800.DBB5, 1009 (digital NC outputs 1 to 8: Overwrite) DB2800.DBB6, 1010 (Digital NC outputs: Setting value from the PLC) MD10360 $MN_FASTIO_DIG_NUM_OUTPUTS							
More information	• Function Manual SINUMERIK 828D basic functions							

DB2800.DBX1010.0 to .7, setting value of digital NC outputs 9 to 16

Table 10-205 DB2800.DBX1010.0 to .7, digital NC outputs 9 to 16: Setting value

DB2800.DBX1010.0 to .7	**Digital NC outputs 9 to 16: Setting value** **Fast signals to NC: PLC → NC**
Update	cyclic
Signal state 1	Value of the setting value is 1.
Signal state 0	Value of the setting value is 0.

DB2800.DBX1010.0 to .7	**Digital NC outputs 9 to 16: Setting value** **Fast signals to NC: PLC → NC**							
More information	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
	Output 16	Output 15	Output 14	Output 13	Output 12	Output 11	Output 10	Output 9
	Using the setting value, the PLC user program can specify a defined output value. In order that the setting value becomes active, it must be activated from the overwrite screen form or the setting screen form.							
	Note The NC/PLC interface DBB6 (digital NC outputs: setting value) is jointly used by: • DB2800.DBB5 (overwrite) with edge change 0 → 1 • DB2800.DBB7 (target) for signal state 1 Activating the two interfaces simultaneously should be avoided.							
Corresponds with	DB2800.DBB4, 1008 (Digital NC outputs: Lock) DB2800.DBB5, 1009 (digital NC outputs 1 to 8: Overwrite) DB2800.DBB6, 1010 (Digital NC outputs: Setting value from the PLC) MD10360 $MN_FASTIO_DIG_NUM_OUTPUTS							
More information	• Function Manual SINUMERIK 828D basic functions							

DB2800.DBX1011.0 to .7, input mask of digital NC outputs 9 to 16

Table 10-206 DB2800.DBX1011.0 to .7, digital NC outputs 9 to 16: Default

DB2800.DBX1011.0 to .7	**Digital NC outputs 9 to 16: Default** **Fast signals to NC: PLC → NC**							
Update	cyclic							
Signal state 1	The target is active.							
Signal state 0	The target is **not** active.							
More information	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
	Output 16	Output 15	Output 14	Output 13	Output 12	Output 11	Output 10	Output 9
	If a bit is set, then for the corresponding output, instead of the NC output value, the setting value specified by the PLC user program is used. The actual NC output value is kept. If a bit is reset, then for the corresponding output, the last NC output value becomes active again.							
	Note The NC/PLC interface DBB6 (digital NC outputs: setting value) is jointly used by: • DB2800.DBB5 (overwrite) with edge change 0 → 1 • DB2800.DBB7 (target) for signal state 1 Activating the two interfaces simultaneously should be avoided.							
Corresponds with	DB2800.DBB4, 1008 (Digital NC outputs: Lock) DB2800.DBB5, 1009 (digital NC outputs 1 to 8: Overwrite) DB2800.DBB6, 1010 (Digital NC outputs: Setting value from the PLC) MD10360 $MN_FASTIO_DIG_NUM_OUTPUTS							
More information	• Function Manual SINUMERIK 828D basic functions							

10.2.4.4 Signals from fast inputs and outputs

DB2900.DBX0.0 to .7, actual value of digital NC inputs 1 to 8

Table 10-207 DB2900.DBX0.0 to .7, digital NC inputs 1 to 8: Actual value

DB2900.DBX0.0 to .7	**Digital NC inputs 1 to 8: Actual value** **Fast signals from the NC: NC → PLC**							
Update	cyclic							
Signal state 1	The actual value is 1.							
Signal state 0	The actual value is 0.							
Description	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
	Input 8	Input 7	Input 6	Input 5	Input 4	Input 3	Input 2	Input 1
	The actual NC output value can be read in the PLC user program via the actual value.							
	Note The value in the "Actual value" interface can, as a result of the various subsequent influencing possibilities "Lock" and "Set", have a different value than that available at the NC output.							
Corresponds with	DB2800.DBB0, 1000 (digital NC inputs 1 - 8: Lock) DB2800.DBB1, 1001 (digital NC inputs 1 - 8: Set) DB2900.DBB0, 1000 (digital NC inputs 1 - 8: Actual value) MD10350 $MN_FASTIO_DIG_NUM_INPUTS							
More information	• Function Manual SINUMERIK 828D basic functions							

DB2900.DBX4.0 to .7, setpoint of digital NC outputs 1 to 8

Table 10-208 DB2900.DBX4.0 to .7, digital NC outputs 1 to 8: Setpoint

DB2900.DBX4.0 to .7	**Digital NC outputs 1 to 8: Setpoint** **Fast signals from the NC: NC → PLC**							
Update	cyclic							
Signal state 1	The setpoint is 1.							
Signal state 0	The setpoint is 0.							
Description	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
	Output 8	Output 7	Output 6	Output 5	Output 4	Output 3	Output 2	Output 1
	The actual NC output value can be read in the PLC user program via the setpoint.							
	Note The value in the "Setpoint" interface can, as a result of the various subsequent influencing possibilities "Target" and "Lock", have a different value than that available at the NC output.							
Corresponds with	DB2800.DBB4, 1008 (Digital NC outputs: Lock) DB2800.DBB5, 1009 (digital NC outputs 1 - 8: Overwrite) DB2800.DBB6, 1010 (Digital NC outputs: Setting value from the PLC) MD10360 $MN_FASTIO_DIG_NUM_OUTPUTS							
More information	• Function Manual SINUMERIK 828D basic functions							

DB2900.DBX1000.0 to .7, actual value of digital NC inputs 9 to 16

Table 10-209 DB2900.DBX1000.0 to .7, digital NC inputs 9 to 16: Actual value

DB2900.DBX1000.0 to .7	**Digital NC inputs 9 to 16: Actual value** **Fast signals from the NC: NC → PLC**							
Update	cyclic							
Signal state 1	The actual value is 1.							
Signal state 0	The actual value is 0.							
Description	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
	Input 16	Input 15	Input 14	Input 13	Input 12	Input 11	Input 10	Input 9
	The actual NC output value can be read in the PLC user program via the actual value.							
	Note The value in the "Actual value" interface can, as a result of the various subsequent influencing possibilities "Lock" and "Set", have a different value than that available at the NC output.							
Corresponds with	DB2800.DBB0, 1000 (digital NC inputs 1 - 8: Lock) DB2800.DBB1, 1001 (digital NC inputs 1 - 8: Set) DB2900.DBB0, 1000 (digital NC inputs 1 - 8: Actual value) MD10350 $MN_FASTIO_DIG_NUM_INPUTS							
More information	• Function Manual SINUMERIK 828D basic functions							

DB2900.DBX1004.0 to .7, setpoint value of digital NC outputs 9 to 16

Table 10-210 DB2900.DBX1004.0 to . 7, digital NC outputs 9 to 16: Setpoint

DB2900.DBX1004.0 to . 7	**Digital NC outputs 9 to 16: Setpoint** **Fast signals from the NC: NC → PLC**							
Update	cyclic							
Signal state 1	The setpoint is 1.							
Signal state 0	The setpoint is 0.							
Description	**Bit 7**	**Bit 6**	**Bit 5**	**Bit 4**	**Bit 3**	**Bit 2**	**Bit 1**	**Bit 0**
	Output 16	Output 15	Output 14	Output 13	Output 12	Output 11	Output 10	Output 9
	The actual NC output value can be read in the PLC user program via the setpoint.							
	Note The value in the "Setpoint" interface can, as a result of the various subsequent influencing possibilities "Target" and "Lock", have a different value than that available at the NC output.							
Corresponds with	DB2800.DBB4, 1008 (Digital NC outputs: Lock) DB2800.DBB5, 1009 (digital NC outputs 1 - 8: Overwrite) DB2800.DBB6, 1010 (Digital NC outputs: Setting value from the PLC) MD10360 $MN_FASTIO_DIG_NUM_OUTPUTS							
More information	• Function Manual SINUMERIK 828D basic functions							

10.2.4.5 Mode signals to NC

Table 10-211 DB3000.DBX0.0, AUTOMATIC mode

DB3000.DBX0.0	**AUTOMATIC mode** **Signals to NC: PLC → NC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	AUTOMATIC mode is selected by the PLC program.	
Signal state 0	AUTOMATIC mode is not selected by the PLC program.	
Signal irrelevant for ...	"Mode change disable" signal.	
See also	Table 10-221 DB3100.DBX0.0, active AUTOMATIC mode (Page 259) Table 10-214 DB3000.DBX0.4, mode change disable (Page 256)	
More information	• Function Manual SINUMERIK 828D basic functions	

Table 10-212 DB3000.DBX0.1, MDI mode

DB3000.DBX0.1	**MDI mode** **Signals to NC: PLC → NC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	MDI mode is selected by the PLC program.	
Signal state 0	MDI mode is not selected by the PLC program.	
Signal irrelevant for ...	"Mode change disable" signal.	
See also	Table 10-222 DB3100.DBX0.1, active MDI mode (Page 260) Table 10-214 DB3000.DBX0.4, mode change disable (Page 256)	
More information	• Function Manual SINUMERIK 828D basic functions	

Table 10-213 DB3000.DBX0.2, JOG mode

DB3000.DBX0.2	**JOG mode** **Signals to NC: PLC → NC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	JOG mode is selected by the PLC program.	
Signal state 0	JOG mode is not selected by the PLC program.	
Signal irrelevant for ...	"Mode change disable" signal.	
See also	Table 10-223 DB3100.DBX0.2, active JOG mode (Page 260) Table 10-214 DB3000.DBX0.4, mode change disable (Page 256)	
More information	• Function Manual SINUMERIK 828D basic functions	

Table 10-214 DB3000.DBX0.4, mode change disable

DB3000.DBX0.4	**Mode change disable** **Signals to NC: PLC → NC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The currently active mode (JOG, MDI or AUTOMATIC) cannot be changed. The machine functions that can be selected within a mode can be changed.	

DB3000.DBX0.4	Mode change disable Signals to NC: PLC → NC
Signal state 0	The mode of the mode group can be changed.
More information	• Function Manual SINUMERIK 828D basic functions

Table 10-215 DB3000.DBX0.7, mode group reset

DB3000.DBX0.7	Mode group reset Signals to NC: PLC → NC	
Edge evaluation: Yes	Signal updated: cyclic	
Edge evaluation 0 → 1	The channel should change into the "Reset" state. The program being executed is then in the "Aborted" program status. All moving axes and spindles are decelerated to zero speed according to their acceleration ramp without contour violation. The initial settings are set, e.g. G functions. The alarms are cleared if they are not POWER ON alarms.	
Edge evaluation 1 → 0	Channel status and program execution are not influenced by this signal.	
Special cases, errors, etc.	An alarm that removes the "Mode group ready" signal ensures that the channel is no longer in the reset state. A "Mode group reset" is then required to switch to another mode.	
See also	Table 10-224 DB3100.DBX0.3, mode group ready (Page 260)	
More information	• Function Manual SINUMERIK 828D basic functions	

Table 10-216 DB3000.DBX1.0, TEACH IN machine function

DB3000.DBX1.0	TEACH IN machine function Signals to NC: PLC → NC	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The TEACH IN machine function is activated for the mode group in JOG mode.	
Signal state 0	The TEACH IN machine function is not activated.	
Signal irrelevant for ...	JOG mode is not active.	
More information	• Function Manual SINUMERIK 828D basic functions	

Table 10-217 DB3000.DBX1.2, REF machine function

DB3000.DBX1.2	REF machine function Signals to NC: PLC → NC	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The REF machine function is activated for the mode group in JOG mode.	
Signal state 0	The REF machine function is not activated.	
Signal irrelevant for ...	JOG mode is not active.	
More information	• Function Manual SINUMERIK 828D basic functions	

Table 10-218 DB3000.DBX1.6, single block type B

DB3000.DBX1.6	**Single block type B** **Signals to NC: PLC → NC**	
Edge evaluation: No	Signal updated:	
Signal state 1	"Single block type B" signal set and "Single block type A" signal not set. Response for all mode groups: • Channel is stopped. • Channel contains a start command. • The channel stops at the end of the block. Note: If the "Single block type B" and "Single block type A" signals are set simultaneously, it is impossible to determine which single block type is required. The control then assumes: No single block for all mode groups.	
Signal state 0	If the "Single block type B" signal is not set and the "Single block type A" signal is set, "Single block type A" is present. Note: If the "Single block type B" signal and the "Single block type A" signal are not set, it is impossible to determine which single block type is required. The control then assumes: No single block for all mode groups.	
See also	Table 10-219 DB3000.DBX1.7, single block type A (Page 258)	
More information	• Function Manual SINUMERIK 828D basic functions	

Table 10-219 DB3000.DBX1.7, single block type A

DB3000.DBX1.7	**Single block type A** **Signals to NC: PLC → NC**	
Edge evaluation: No	Signal updated:	
Signal state 1	"Single block type A" signal set and "Single block type B" signal not set. Response for all mode groups: • Channel is stopped. • Channel receives a start command. • The channel stops at the end of the block. • All channels are stopped at a block limit (at some point in time). Note: If the "Single block type B" and "Single block type A" signals are set simultaneously, it is impossible to determine which single block type is required. The control then assumes: No single block for all mode groups.	
Signal state 0	If the "Single block type A" signal is not set and the "Single block type B" signal is set, "Single block type B" is present. Note: If the "Single block type B" signal and the "Single block type A" signal are not set, it is impossible to determine which single block type is required. The control then assumes: No single block for all mode groups.	
See also	Table 10-218 DB3000.DBX1.6, single block type B (Page 258)	
More information	• Function Manual SINUMERIK 828D basic functions	

Table 10-220 DB3000.DBX2.0 to .6, machine functions INC1, INC10, INC100, INC1000, INC10000, INCvar, continuous

DB3000.DBX2.0 to .6	Machine functions INC1, INC10, INC100, INC1000, INC10000, INCvar, continuous Signals to NC: PLC → NC	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	This input range is only used if the "INC inputs active in the mode area" signal is set. The signals then apply for all axes and geometry axes. The "INC inputs active in the mode area" signal specifies how many increments the axis traverses when the traversing key is pressed or the handwheel is turned one detent position. In this case, JOG mode must be active. The SD41010_$SC_JOG_VAR_INCR_SIZE value generally applies for the "INCvar" signal. With "Continuous", the associated axis can be traversed with the plus or minus traversing key as long as the key is pressed. As soon as the selected machine function becomes active, this is signaled to the "Active machine function INC1; ..." signal. If several signals, "INC1, INC..." or "Continuous travel", are simultaneously selected at the interface, then the control does not activate a machine function. Note: The "INC1..." or "Continuous" input signal to change an active machine function must be present for at least one PLC cycle. A steady-state signal is not required.	
Signal state 0	The relevant machine function is not selected. No request is made to change an active machine function. If an axis is currently traversing an increment, this movement is also aborted if this machine function is deselected or switched over.	
See also	Table 10-181 DB2600.DBX1.0, INC inputs in the mode signal range active (Page 241) Table 10-275 DB3200.DBX1001.0 to .6, 1005.0 to .6, 1009.0 to .6, machine functions INC1 to INCvar (Page 287) Table 10-362 DB380x.DBX5.0 to .6, machine functions INC1 ... INCvar (Page 330) Table 10-319 DB3300.DBX1001.0 to .6, 1005.0 to .6, 1009.0 to .6, machine functions INC1 ... continuous for axes in the WCS (Page 305) Table 10-429 DB390x.DBX5.0 to .6, machine functions INC1 ... continuous (Page 364)	
More information	• Function Manual SINUMERIK 828D Axes and Spindles	

10.2.4.6 Mode signals from NC

Table 10-221 DB3100.DBX0.0, active AUTOMATIC mode

DB3100.DBX0.0	Active AUTOMATIC mode Signals from NC: NC → PLC	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	AUTOMATIC mode is active.	
Signal state 0	AUTOMATIC mode is not active.	
More information	• Function Manual SINUMERIK 828D basic functions	

Table 10-222 DB3100.DBX0.1, active MDI mode

DB3100.DBX0.1	**Active MDI mode** **Signals from NC: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	MDI mode is active.	
Signal state 0	MDI mode is not active.	
More information	• Function Manual SINUMERIK 828D basic functions	

Table 10-223 DB3100.DBX0.2, active JOG mode

DB3100.DBX0.2	**Active JOG mode** **Signals from NC: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	JOG mode is active.	
Signal state 0	JOG mode is not active.	
More information	• Function Manual SINUMERIK 828D basic functions	

Table 10-224 DB3100.DBX0.3, mode group ready

DB3100.DBX0.3	**Mode group ready** **Signals from NC: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	This signal is set after power on and build-up of all voltages. The mode group is now ready, and part programs can be executed and axes traversed in the channel.	
Signal state 0	The mode group / channel is not ready. Possible causes for this are: • There is a critical axis or spindle alarm present • A hardware fault is present • Mode group is incorrectly configured (machine data) If "Mode group ready" changes to signal state "0", the following happens: • The axis and spindle drives are braked down to standstill with the max. braking current • The signals from the PLC to the NC are brought into an inactive state (reset position)	
Special cases, errors, etc.	An alarm that removes the "Mode group ready" signal ensures that the channel is no longer in the reset state. A reset must then be performed using signal "Reset" to switch to another mode.	
More information	• Function Manual SINUMERIK 828D Basic Functions	

DB310xDBX0.7, all channels in Reset state

Table 10-225 DB310x.DBX0.7, all channels in "Reset" state

DB310x.DBX0.7	**All channels in the "Reset" state** **Mode signals: NC → PLC**		
Update	cyclic		
Signal state 1	All mode group channels are in the "Reset" state.		

DB310x.DBX0.7	All channels in the "Reset" state Mode signals: NC → PLC		
Signal state 0	At least one channel of the mode group is not in the "Reset" state.		
Corresponds with	DB320x.DBX7.7 (channel status "Reset")		
More information	• Function Manual SINUMERIK 828D basic functions		

Table 10-226 DB3100.DBX1.0, active TEACH IN machine function

DB3100.DBX1.0	Active TEACH IN machine function Signals from NC: NC → PLC	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The TEACH IN machine function is active in JOG mode.	
Signal state 0	The TEACH IN machine function is not active.	
More information	• Function Manual SINUMERIK 828D basic functions	

Table 10-227 DB3100.DBX1.2, active REF machine function

DB3100.DBX1.2	Active REF machine function Signals from NC: NC → PLC	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The REF machine function is active in JOG mode.	
Signal state 0	The REF machine function is not active.	
More information	• Function Manual SINUMERIK 828D basic functions	

10.2.5 Channel-specific signals

10.2.5.1 Signals to the NC channel

Control signals to NC channel

DB320x.DBX0.1, activate travel backward

Table 10-228 DB320x.DBX0.1, RESU: backward/forward

DB320x.DBX0.1	RESU: backward/forward Signals to NC channel: PLC → NC
Update	cyclic
Signal state 1	Requirement: Reverse travel
Signal state 0	Requirement: Forward travel

DB320x.DBX0.1	**RESU: backward/forward** **Signals to NC channel: PLC → NC**
Description	Precise retracing of contours is possible on all programmed contours comprising straight and circular elements. During retracing, other contour elements such as splines or automatically inserted non-linear contour elements (circle, parable, etc. e.g. through tool radius compensation) are mapped as straight lines between the start and end points of the corresponding contour element, thereby preventing precise retracing of contours. The main RESU program (CC_RESU.MPF) is generated from the logged traversing blocks of the RESU internal block buffer, so corresponding to the interface signal, the next time that the NC starts, the contour can be traversed either backward or forward.
Corresponds with	DB320x.DBX0.1 (RESU: backward/forward) DB320x.DBX0.2 (RESU: start retrace support) DB330x.DBX0.1 (RESU: retrace mode active) DB330x.DBX0.2 (RESU: retrace support active)

DB320x.DBX0.2, activate travel forward

Table 10-229 DB320x.DBX0.2, RESU: Start retrace support

DB320x.DBX0.2	**RESU: Start retrace support** **Signals to NC channel: PLC → NC**
Update	cyclic
Edge change 0 → 1	"Start retrace support" is requested.
Edge change 1 → 0	No effect.
Description	For retrace support, RESU automatically reselects the original machining program and launches a block search with calculation as far as the program continuation point.
Corresponds with	DB320x.DBX0.1 (RESU: backward/forward) DB330x.DBX0.1 (RESU: retrace mode active) DB320x.DBX0.2 (RESU: retrace support active)

Table 10-230 DB3200.DBX0.3, activate DRF

DB3200.DBX0.3	**Activate DRF** **Signals to NC channel: PLC → NC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The DRF function is selected. The selection can be made directly from the PLC user program or from the HMI via the "Activate DRF" interface signal. As soon as the DRF function is active, the DRF offset can be changed in AUTOMATIC or MDI mode with the handwheel.	
Signal state 0	The DRF function is not selected.	
Application	The DRF function can be specifically enabled from the PLC user program with the "Activate DRF" signal.	
See also	Table 10-120 DB1700.DBX0.3, DRF selected (Page 216)	
More information	• Function Manual SINUMERIK 828D basic functions	

Table 10-231 DB3200.DBX0.4, activate single block

DB3200.DBX0.4	Activate single block Signals to NC channel: PLC → NC
Edge evaluation: No	Signal updated: cyclic
Signal state 1	The program is processed in single block mode during AUTOMATIC mode. Only a single block can be entered in MDI.
Signal state 0	No effect.
Application	A new program can first be tested in single block mode in order to monitor the individual program steps more exactly.
Special cases, errors, etc.	• When tool radius correction (G41, G42) is selected, intermediate blocks are inserted when required. • In a series of G33 blocks, a single block is only effective when "Dry run feedrate" is selected. • With "Single block coarse", pure computation blocks are not processed in the single step, only with "Single block fine". The preselection is made by pressing the "Program control" softkey.
See also	Table 10-294 DB3300.DBX3.2, program status stopped (Page 296)
More information	• Function Manual SINUMERIK 828D basic functions

Table 10-232 DB3200.DBX0.5, activate M01

DB3200.DBX0.5	Activate M01 Signals to NC channel: PLC → NC
Edge evaluation: No	Signal updated: cyclic
Signal state 1	M01 in the part program leads to a programmed stop when being executed in AUTOMATIC or MDI mode.
Signal state 0	M01 in the part program does not lead to a programmed stop.
See also	Table 10-121 DB1700.DBX0.5, M01 selected (Page 216) Table 10-283 DB3300.DBX0.5, M0/M1 active (Page 291)
More information	• Function Manual SINUMERIK 828D basic functions

Table 10-233 DB3200.DBX0.6, activate dry run feedrate

DB3200.DBX0.6	Activate dry run feedrate Signals to NC channel: PLC → NC
Edge evaluation: No	Signal updated: cyclic
Signal state 1	The dry run feedrate defined via SD42100 is used instead of the programmed feedrate (for G1, G2, G3, CIP, CT) if the dry run feedrate is greater than that programmed. The interface signal is evaluated at NC start when the channel is in the "Reset" state. When selected using the PLC, the PLC user program sets the "Activate dry run feedrate" signal.
Signal state 0	The programmed feedrate is used. Effective after the "Reset" state.
Application	Testing a workpiece program with an increased feedrate.
See also	Table 10-122 DB1700.DBX0.6, dry run feedrate selected (Page 217) SD42100 $SC_DRY_RUN_FEED "Dry run feedrate"
More information	• Function Manual SINUMERIK 828D basic functions

Table 10-234 DB3200.DBX1.0, activate referencing

DB3200.DBX1.0	**Activate referencing** **Signals to NC channel: PLC → NC**	
Edge evaluation: Yes	Signal updated: cyclic	
Edge change 0 → 1	Channel-specific referencing is started with the "Activate referencing" signal. The control acknowledges a successful start with the "Referencing active" signal. Each machine axis assigned to the channel can be referenced with channel-specific referencing (this is achieved internally in the control by simulating the plus/minus traversing keys). The axis-specific referencing MD34110 $MA_REFP_CYCLE_NR can be used to define the sequence in which the machine data is referenced. When all the axes entered in MD34110 have reached their reference point, the "All axes referenced" signal is set.	
Edge change 1 → 0	No effect.	
Application	If the machine axes are to be referenced in a particular sequence, the following options are available: • The operator must observe the correct sequence when starting. • The PLC must check the sequence when starting or define it itself. • The channel-specific referencing function is used.	
See also	Table 10-285 DB3300.DBX1.0, referencing active (Page 292) Table 10-300 DB3300.DBX4.2, all axes that have to be referenced are referenced (Page 298) MD34110 $MA_REFP_CYCLE_NR "Axis sequence for channel-specific referencing"	
More information	• Function Manual SINUMERIK 828D Axes and Spindles	

Table 10-235 DB3200.DBX1.1, enable protection areas

DB3200.DBX1.1	**Enable protection areas** **Signals to NC channel: PLC → NC**	
Edge evaluation: Yes	Signal updated: cyclic	
Edge change 0 → 1	With a positive edge of this signal, a protection area is enabled and the active alarm cleared. Then, motion can start in the same protection area. As a result of the start of motion, the protection area is enabled, the "Machine or channel-specific protection area violated" signal is set, and the axis starts to move. The enable signal is not required if a motion is started that does not lead into the enabled protection area.	
Edge change 1 → 0	No effect	
Application	Protection areas are enabled: • If the current position is in a protection area (alarm 2 present) • If motion is to be started on the protection area limit (alarm 1 or 2 present)	
More information	• Function Manual SINUMERIK 828D monitoring and compensating	

DB320x.DBX1.2, synchronous action off

Table 10-236 DB320x.DBX1.2, disable all synchronous actions

DB320x.DBX1.2	Disable all synchronized actions Signals to NC channel: PLC → NC
Update	cyclic
Signal state 1	All synchronized actions in the channel are locked. No synchronized action is therefore executed.
Signal state 0	Synchronized actions are executed in the channel.
More information	• Function Manual SINUMERIK 828D synchronized actions

Table 10-237 DB3200.DBX1.6, complete PLC action

DB3200.DBX1.6	Complete PLC action Signals to NC channel: PLC → NC	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The PLC action has been completed.	
Signal state 0	The PLC action has not been completed yet.	
Application	At the end of the block search, concluding action blocks are executed: DB3300, ... DBX0.3 (action block active) == 1 AND DB3300, ... DBX0.6 (last action block active) == 1. Alarm "10208 Channel <channel number> Actuate NC start to continue the program" indicates that a new NC Start is required to continue the NC program as of the target block. If other actions are to be executed by the PLC user program prior to the NC start (e.g. tool change), by parameterizing the search mode, the output of the alarm can be delayed until the following signal is set again: MD11450 $MN_SEARCH_RUN_MODE = 1	
See also	Table 10-281 DB3300.DBX0.3, action block active (Page 290) Table 10-284 DB3300.DBX0.6, last action block active (Page 292)	
More information	• Function Manual SINUMERIK 828D basic functions	

Table 10-238 DB3200.DBX1.7, activate program test

DB3200.DBX1.7	Activate program test Signals to NC channel: PLC → NC	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	Activation of the program test is requested. During the program test, all motion commands of axes (not spindles) take place under "Axis disable". Notice! Because of the axis disable, the assignment of a tool magazine is not changed during program testing. The user / machine manufacturer must use a suitable PLC user program to ensure that the NC-internal tool management and the actual assignment of the tool magazine remain consistent. Refer to the program example included in the PLC Toolbox.	
Signal state 0	Activation of the program test is not requested.	

DB3200.DBX1.7	**Activate program test** **Signals to NC channel: PLC → NC**
See also	Table 10-124 DB1700.DBX1.7, program test selected (Page 217) Table 10-291 DB3300.DBX1.7, program test active (Page 294)
More information	• Function Manual SINUMERIK 828D basic functions

DB320x.DBX2.0 to .7, activate Skip block

Table 10-239 DB320x.DBX2.0 to .7, activate "Skip block" (SKP)

DB320x.DBX2.0 to .7	**Activate "skip block" (SKP)** **Signals to NC channel: PLC → NC**
Update	cyclic
Signal state 1	Activation of "Skip block" (SKP) of the skip level is requested.
Signal state 0	Activation of "Skip block" (SKP) of the skip level is **not** requested.
Description	Bit 0 to bit 7 are assigned to skip levels 0 to 7. **Note** We recommend that the interface signal is already set before the NC program starts. **Note** For multiple consecutive skip blocks, the blocks are only skipped if the interface signal was already present **before** the **first** skip block of the block sequence was decoded. **Note** The selection of "Skip block" (SKP) is made via the SINUMERIK Operate user interface in the operating area "Automatic" > "Program control" by setting the HMI/PLC interface signal DB170x.DBX2.0 to .7. Depending on the value of the FB1 parameter `MMCToIf`, the interface signal is transferred from the basic PLC program to the NC/PLC interface signal DB320x.DBX2.0 to .7: • "TRUE": Transmission • "FALSE": No transmission The default value of the parameter is "TRUE".
Corresponds with	DB170x.DBX2.0 to .7 ("Skip block" (SKP) selected)
More information	• Function Manual SINUMERIK 828D basic functions

Table 10-240 DB3200.DBB4, feedrate override

DB3200.DBB4	**Feedrate override** **Signals to NC channel: PLC → NC**		
Edge evaluation: No		Signal updated: cyclic	
Signal state 1	Gray coding for feedrate override		
	Switch setting	Code	Feedrate override factor
	1	00001	0.0
	2	00011	0.01
	3	00010	0.02
	4	00110	0.04
	5	00111	0.06
	6	00101	0.08
	7	00100	0.10
	8	01100	0.20
	9	01101	0.30
	10	01111	0.40
	11	01110	0.50
	12	01010	0.60
	13	01011	0.70
	14	01001	0.75
	15	01000	0.80
	16	11000	0.85
	17	11001	0.90
	18	11011	0.95
	19	11010	1.00
	20	11110	1.05
	21	11111	1.10
	22	11101	1.15
	23	11100	1.20
	24	10100	1.20
	25	10101	1.20
	26	10111	1.20
	27	10110	1.20
	28	10010	1.20
	29	10011	1.20
	30	10001	1.20
	31	10000	1.20
See also	Table 10-247 DB3200.DBX6.7, feedrate override active (Page 272)		
More information	• Function Manual SINUMERIK 828D Axes and Spindles		

Table 10-241 DB3200.DBB5, rapid traverse override

DB3200.DBB5	**Rapid traverse override** **Signals to NC channel: PLC → NC**		
Edge evaluation: No		Signal updated: cyclic	
Signal state 1	Gray coding for rapid traverse override		
	Switch setting	Code	Feedrate override factor
	1	00001	0.0
	2	00011	0.01
	3	00010	0.02
	4	00110	0.04
	5	00111	0.06
	6	00101	0.08
	7	00100	0.10
	8	01100	0.20
	9	01101	0.30
	10	01111	0.40
	11	01110	0.50
	12	01010	0.60
	13	01011	0.70
	14	01001	0.75
	15	01000	0.80
	16	11000	0.85
	17	11001	0.90
	18	11011	0.95
	19	11010	1.00
	20	11110	1.00
	21	11111	1.00
	22	11101	1.00
	23	11100	1.00
	24	10100	1.00
	25	10101	1.00
	26	10111	1.00
	27	10110	1.00
	28	10010	1.00
	29	10011	1.00
	30	10001	1.00
	31	10000	1.00
See also	Table 10-246 DB3200.DBX6.6, rapid traverse override active (Page 271)		
More information	• Function Manual SINUMERIK 828D Axes and Spindles		

Table 10-242 DB3200.DBX6.0, feed disable

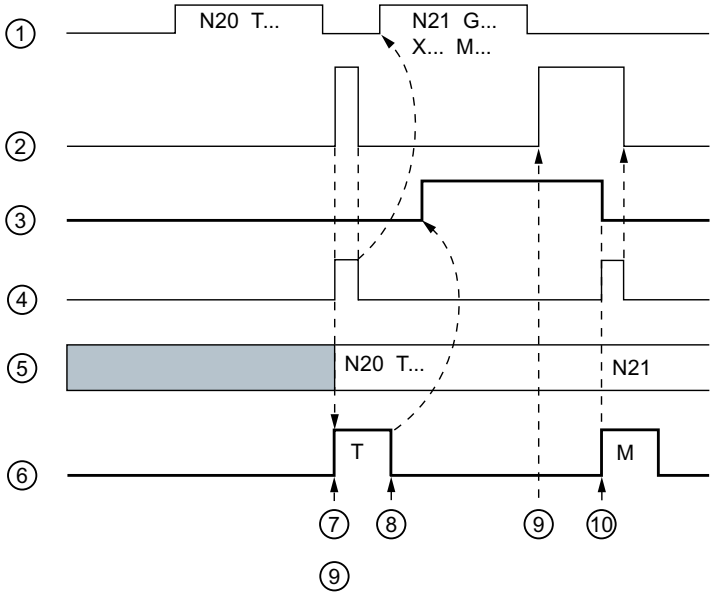
DB3200.DBX6.0	**Feed disable** **Signals to NC channel: PLC → NC**
Edge evaluation: No	Signal updated: cyclic
Signal state 1	The signal is active in a channel in all operating modes. The signal disables the feed for all of the axes that interpolate relative to one another as long as G33 (thread) is not active. All axes are brought to a standstill, but still maintaining the path contour. When the feed disable is canceled (0 signal), the interrupted part program is continued. The position control is retained, i.e. the following error is eliminated. If a travel request is issued for an axis with an active "Feed disable", then this is retained. The queued travel request is executed immediately when the "Feed disable" is canceled. If the axis is interpolating in relation to others, this also applies to these axes.
Signal state 0	The feed is enabled for all axes of the channel. If a travel request ("travel command") exists for an axis or group of axes when the "Feed disable" is canceled, then this is executed immediately.
See also	The feed disable has no effect when G33 is active.
More information	• Function Manual SINUMERIK 828D Axes and Spindles

Table 10-243 DB3200.DBX6.1, read-in disable

DB3200.DBX6.1	**Read-in disable** **Signals to NC channel: PLC → NC**
Edge evaluation: No	Signal updated: cyclic
Signal state 1	The data transfer for the next block is disabled in the interpolator. The signal is only active in the AUTOMATIC and MDI modes.
Signal state 0	The data transfer for the next block is enabled in the interpolator. This signal is only active in the AUTOMATIC and MDI modes.

Application

If the auxiliary functions must be completed (e.g. for the tool change) before the next NC block can be processed, then the automatic block change must be prevented through the read-in disable.



① Read-in to the buffer
② Block processed
③ Read-in disable signal
④ Data transfer
⑤ Contents of the interpolator
⑥ Output of the auxiliary functions
⑦ Data transfer to the interpolator
⑧ Read-in disable for tool change
⑨ Query position of the read-in enable
⑩ Cancel read-in disable

Figure 10-1 Read-in disable

See also

Table 10-292 DB3300.DBX3.0, program status running (Page 295)

More information

- Function Manual SINUMERIK 828D basic functions

Table 10-244 DB3200.DBX6.2, delete distance-to-go

DB3200.DBX6.2	**Delete distance-to-go** **Signals to NC channel: PLC → NC**
Edge evaluation: No	Signal updated: cyclic
Signal state 1	The interface signal is only active for path axes in AUTOMATIC mode. The rising edge of the interface signal is only effective for the axes in the geometry grouping. They are also stopped with a ramp stop and their distance-to-go deleted (setpoint - actual value difference). Any remaining following error is still corrected. The next program block is then started. Remark: The interface signal does not effect the running dwell time in a program block with dwell time.
Signal state 0	No effect.
Signal irrelevant for ...	Positioning axes
Application	Termination of the traversing motion on account of an external signal, e.g. probe.
Special cases, errors, etc.	After the axes have been stopped with the "Delete distance-to-go" signal, the next program block is prepared with the new positions. After a "Delete distance-to-go", the geometry axes thus follow a different contour to the one originally defined in the part program. If `G90` is programmed in the following block after "Delete distance-to-go", it is at least possible to approach the programmed absolute position. On the other hand, with `G91`, the position originally defined in the part program is no longer reached in the following block.
See also	Signals to the axis/spindle (Page 316)
More information	• Function Manual SINUMERIK 828D basic functions

Table 10-245 DB3200.DBX6.4, program level abort

DB3200.DBX6.4	**Program level abort** **Signals to NC channel: PLC → NC**
Edge evaluation: Yes	Signal updated: cyclic
Edge change 0 → 1	At each edge change 0 -- 1, the current program level being processed (subprogram level) is immediately aborted. Processing of the part program continues at the next higher program level from the exit point.
Edge change 1 → 0	No effect.
Special cases, errors, etc.	The main program level cannot be aborted with this interface signal, only with the "Reset" signal.
More information	• Function Manual SINUMERIK 828D basic functions

Table 10-246 DB3200.DBX6.6, rapid traverse override active

DB3200.DBX6.6	**Rapid traverse override active** **Signals to NC channel: PLC → NC**
Edge evaluation: No	Signal updated: cyclic
Signal state 1	The rapid traverse override between 0 and a maximum of 100% entered at the interface is channel-specific.

DB3200.DBX6.6	**Rapid traverse override active** **Signals to NC channel: PLC → NC**
Signal state 0	The rapid traverse override entered at the PLC interface is ignored. When the rapid traverse override is inactive, the NC always uses 100% as the internal override factor. Note: The 1st switch position of the gray-coded interface for the value is an exception. This override factor is also used for "Rapid traverse override inactive", and 0% is output as override value for axes.
Special cases, errors, etc.	The rapid traverse override is inactive when G33 is active.
See also	Table 10-241 DB3200.DBB5, rapid traverse override (Page 268)
More information	• Function Manual SINUMERIK 828D basic functions

Table 10-247 DB3200.DBX6.7, feedrate override active

DB3200.DBX6.7	**Feedrate override active** **Signals to NC channel: PLC → NC**
Edge evaluation: No	Signal updated: cyclic
Signal state 1	The feedrate override between 0 and a maximum of 120% entered at the PLC interface is active for the path velocity and therefore automatically for the associated axes. In JOG mode, the feedrate override acts directly on the axes.
Signal state 0	The feedrate override entered at the PLC interface is ignored. When the feedrate override is inactive, the NC always uses 100% as the internal override factor. Note: The 1st switch position of the gray-coded interface for the value is an exception. This override factor is also used for "Feedrate override inactive", and 0% is output as override value for axes - has the same effect as "Feed disable" .
Special cases, errors, etc.	The feedrate override is inactive when G33 is active.
See also	Table 10-240 DB3200.DBB4, feedrate override (Page 267)
More information	• Function Manual SINUMERIK 828D basic functions

Table 10-248 DB3200.DBX7.0, NC start disable

DB3200.DBX7.0	**NC start disable** **Signals to NC channel: PLC → NC**
Edge evaluation: No	Signal updated: cyclic
Signal state 1	The "NC start" signal is inactive.
Signal state 0	The "NC start" signal is active.
Application	This interface signal is used, for example, to suppress renewed program execution because there is no lubricant.
See also	Table 10-249 DB3200.DBX7.1, NC start (Page 273)
More information	• Function Manual SINUMERIK 828D basic functions

Table 10-249 DB3200.DBX7.1, NC start

DB3200.DBX7.1	**NC start** **Signals to NC channel: PLC → NC**	
Edge evaluation: Yes	Signal updated: cyclic	
Edge change 0 → 1	AUTOMATIC mode: The selected NC program is started or continued. If data is transferred from the PLC to the NC during the "Program interrupted" state, then this data is immediately cleared with "NC start". MDI mode: The part program blocks that were entered are enabled for execution or are continued.	
Edge change 1 → 0	No effect.	
See also	Table 10-248 DB3200.DBX7.0, NC start disable (Page 272)	
More information	• Function Manual SINUMERIK 828D basic functions	

Table 10-250 DB3200.DBX7.2, NC stop at block limit

DB3200.DBX7.2	**NC stop at block limit** **Signals to NC channel: PLC → NC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The current NC program is stopped after the current part program block has been completely processed. Otherwise the "NC stop" signal applies.	
Signal state 0	No effect.	
See also	Table 10-251 DB3200.DBX7.3, NC stop (Page 273) Table 10-252 DB3200.DBX7.4, NC stop axes plus spindles (Page 274) Table 10-294 DB3300.DBX3.2, program status stopped (Page 296) Table 10-298 DB3300.DBX3.6, channel status interrupted (Page 297)	
More information	• Function Manual SINUMERIK 828D basic functions	

Table 10-251 DB3200.DBX7.3, NC stop

DB3200.DBX7.3	**NC stop** **Signals to NC channel: PLC → NC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The NC program being executed is immediately stopped and the current block is not completed. Only the axes without contour violation are stopped. Distances-to-go are only completed after a new start. The program status changes to "Stopped", the channel status changes to "Interrupted".	
Signal state 0	No effect.	

Application

The program is continued at the interrupted position with NC start.

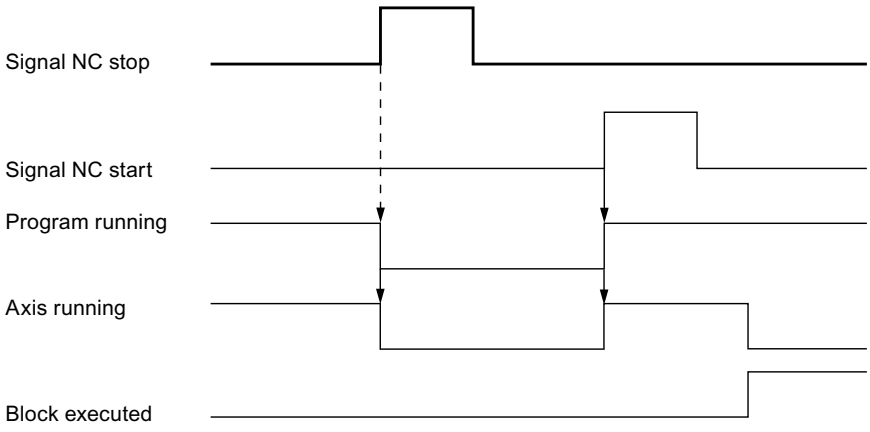


Figure 10-2 NC stop - axis

Special cases, errors, etc.

The "NC stop" signal must be active for at least one PLC cycle.

See also

Table 10-250 DB3200.DBX7.2, NC stop at block limit (Page 273)

Table 10-252 DB3200.DBX7.4, NC stop axes plus spindles (Page 274)

Table 10-294 DB3300.DBX3.2, program status stopped (Page 296)

Table 10-298 DB3300.DBX3.6, channel status interrupted (Page 297)

More information

- Function Manual SINUMERIK 828D basic functions

Table 10-252 DB3200.DBX7.4, NC stop axes plus spindles

DB3200.DBX7.4	**NC stop axes plus spindles** **Signals to NC channel: PLC → NC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The NC program being executed is immediately stopped, the actual block is not completed. Distances-to-go are only completed after a new start. The axes and spindle are stopped. However, these are stopped in a controlled manner. The program status changes to "Stopped" and the channel status changes to "Interrupted".	
Signal state 0	No effect.	
Signal irrelevant for ...	• Channel status reset or • Program status aborted	

Application

All axes and spindles that have not been started by a program or a program block do not brake to a standstill with "NC stop" axes plus spindles, e.g. if the axes are controlled via the traversing keys on the machine control panel.

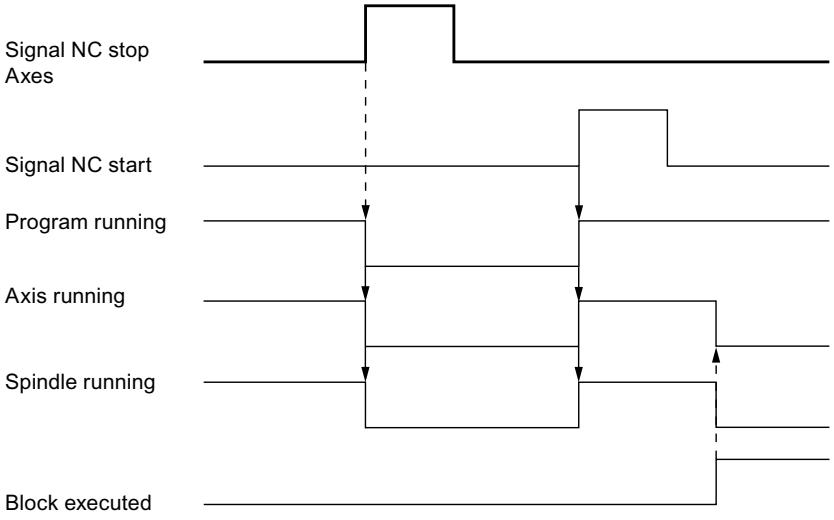


Figure 10-3 NC stop - axis plus spindle

See also

Table 10-250 DB3200.DBX7.2, NC stop at block limit (Page 273)

Table 10-251 DB3200.DBX7.3, NC stop (Page 273)

Table 10-294 DB3300.DBX3.2, program status stopped (Page 296)

Table 10-298 DB3300.DBX3.6, channel status interrupted (Page 297)

More information

- Function Manual SINUMERIK 828D Basic Functions

Table 10-253 DB3200.DBX7.6, configured stop function activation

DB3200.DBX7.6	**Signal from drive: NCK → PLC**
Edge evaluation: No	
Signal state 1	Activation of the configured stop is requested.
Signal state 0	Activation of the configured stop is not requested.

DB3200.DBX7.6	**Signal from drive: NCK → PLC**
Application	"Activate configured stop" (CST) can also be selected via the SINUMERIK Operate user interface in the "Automatic" > "Program control" operating area by setting the HMI/ PLC interface signal DB170x.DBX0.1. Switching on is done either directly via a VDI interface signal "Activate configured stop" or via the extended CST selection option in the Program control dialog.
See also	DB170x.DBX0.1, configured stop funct. (CST) selected (Page 216)

DB320x.DBX7.7, reset

Table 10-254 DB320x.DBX7.7, reset

DB320x.DBX7.7	**Reset** **Signals to NC channel: PLC → NC**
Update	cyclic
Signal state 1	Channel reset is requested.
Signal state 0	Channel reset is **not** requested.
Description	Responses: • All traversing axes and spindles are decelerated without contour violation to zero speed according to their acceleration curves. • All channel-specific reset positions become active. • All alarms of the channel, other than Power On alarms, are deleted. • Channel status: "Reset" (DB330x.DBX3.7 == 1) • Program state of an active NC program: "Canceled" (DB330x.DBX3.4 == 1) **Note** After a channel reset from the PLC user program, before a new action can be requested in the channel (e.g. NC start or axis interchange), the system must wait for the channel state "reset" to be indicated at the NC/PLC interface. DB330x.DBX3.7 == 1
Corresponds with	DB320x.DBX7.1 (NC start) DB320x.DBX7.3 (NC stop) DB330x.DBX3.4 (program status "Canceled") DB330x.DBX3.7 (channel status "Reset")
More information	Function Manual SINUMERIK 828D basic functions

Table 10-255 DB3200.DBX8.0 to .DBX9.1, activate machine-related protection area 1 (...10)

DB3200.DBX8.0 to .7 **DB3200.DBX9.0 to .1**	**Activate machine-related protection area 1 (...10)** **Signals to NC channel: PLC → NC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The preactivated, machine-related protection area 1 (...10) is activated by the PLC user program. The protection area is active immediately. Only protection areas that have been preactivated in the part program can be activated.	

DB3200.DBX8.0 to .7 **DB3200.DBX9.0 to .1**	**Activate machine-related protection area 1 (...10)** **Signals to NC channel: PLC → NC**
Signal state 0	The preactivated, machine-related protection area 1 (...10) is deactivated by the PLC user program. The protection area is inactive immediately. Only protection areas that have been activated via the PLC and have been preactivated in the NC part program can be deactivated.
Application	Before a probe, for example, is moved into the working area, the associated machine-related protection area can be activated.
More information	Function Manual SINUMERIK 828D basic functions

Table 10-256 DB3200.DBX10.0 to 11.1, activate channel-specific protection area 1 (...10)

DB3200.DBX10.0 to .7 **DB3200.DBX11.0 to .1**	**Activate channel-specific protection area 1 (...10)** **Signals to NC channel: PLC → NC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The preactivated, channel-specific protection area 1 (...10) is activated by the PLC user program. The protection area is active immediately. Only protection areas that have been preactivated in the part program can be activated.	
Signal state 0	The pre-activated, channel-specific protection area 1 (...10) is deactivated by the PLC user program. The protection area is inactive immediately. Only protection areas that have been activated via the PLC and have been preactivated in the NC part program can be deactivated.	
Application	Before a synchronous spindle, for example, is moved into the working area, the associated channel-specific protection area can be activated.	
More information	Function Manual SINUMERIK 828D basic functions	

DB320x.DBX13.0 to .3, activate fixed feedrate

Table 10-257 DB320x.DBX13.0 to .3, activate fixed feedrate 1 to 4, path/geometry axes

<table>
<tr><td>DB320x.DBX13.0 to .3</td><td colspan="5">Activate fixed feedrate 1 to 4, path/geometry axes
Signals to NC channel: PLC → NC</td></tr>
<tr><td>Update</td><td colspan="5">cyclic</td></tr>
<tr><td>Description</td><td colspan="5">With the interface signals, in the AUTOMATIC mode, instead of the programmed feedrate or the configured JOG velocities, the fixed feedrate - parameterized using machine data - is activated.</td></tr>
<tr><td></td><td>Bit 3</td><td>Bit 2</td><td>Bit 1</td><td>Bit 0</td><td>Meaning</td></tr>
<tr><td></td><td>0</td><td>0</td><td>0</td><td>0</td><td>Fixed feedrate not selected</td></tr>
<tr><td></td><td>0</td><td>0</td><td>0</td><td>1</td><td>Fixed feedrate 1</td></tr>
<tr><td></td><td>0</td><td>0</td><td>1</td><td>0</td><td>Fixed feedrate 2</td></tr>
<tr><td></td><td>0</td><td>1</td><td>0</td><td>0</td><td>Fixed feedrate 3</td></tr>
<tr><td></td><td>1</td><td>0</td><td>0</td><td>0</td><td>Fixed feedrate 4</td></tr>
<tr><td></td><td colspan="5">The fixed feedrates are parameterized using the following machine data:
• Linear axes: MD12202 $MN_PERMANENT_FEED
• Rotary axes: MD12204 $MN_PERMANENT_ROT_AX_FEED</td></tr>
<tr><td></td><td colspan="5">Notes
• The fixed feedrate is not used for:
– Spindles
– Positioning axes
– Tapping
• The fixed feedrate is always interpreted as linear feedrate. Switchover to linear feedrate is performed internally in the control system also when revolutional feedrate is active.</td></tr>
<tr><td>Corresponds with</td><td colspan="5">MD12200 $MN_RUN_OVERRIDE_0 (traversing behavior with override 0)
MD12202 $MN_PERMANENT_FEED (fixed feedrates for linear axes)
MD12204 $MN_PERMANENT_ROT_AX_FEED (fixed feedrates for rotary axes)</td></tr>
<tr><td>More information</td><td colspan="5">Function Manual SINUMERIK 828D basic functions</td></tr>
</table>

Table 10-258 DB3200.DBX13.5, deactivate workpiece counter

DB3200.DBX13.5	**Deactivate workpiece counter** **Signals to NC channel: PLC → NC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The workpiece count monitoring is deactivated with activated tool monitoring.	
Signal state 0	No effect.	
More information	Function Manual SINUMERIK 828D Tools	

DB320x.DBX13.7, do not disable tool

Table 10-259 DB320x.DBX13.7, TOOLMAN: Tool lock not active

DB320x.DBX13.7	**TOOLMAN: Tool lock not active** **Signals to NC channel: PLC → NC**
Update	Job-controlled
Signal state 1	Tool lock **not**active.
Signal state 0	Tool lock is active
Description	A tool assumes the "locked" state if the actual value of the active monitoring function (workpiece count, tool life or wear) has reached a value of zero. If the tool is still being used, then it remains in use (for machining) until the next tool change. After that the tool can no longer be used. Using the interface signal, it can be set that the NC does not take the "locked" state into account when searching for a tool that can be used. The interface signal is **not** active if the tool selection is realized using in it blocks (reset and start mode mask).
Corresponds with	MD22562 $MC_TOOL_CHANGE_ERROR_MODE (response for tool change errors)
More information	Function Manual SINUMERIK 828D Tool Management

Table 10-260 DB3200.DBB14.0 and .2, activate handwheel 1/2/3 as contour handwheel

DB3200.DBB14.0 to .2	**Activate handwheel 1 as contour handwheel** **Activate handwheel 2 as contour handwheel** **Activate handwheel 3 as contour handwheel** **Signals to NC channel: PLC → NC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	Handwheel 1/2/3 is selected as contour handwheel.	
Signal state 0	Handwheel 1/2/3 is deselected as contour handwheel.	
Application	Enabling/disabling of the contour handwheel can be performed in the middle of a block. When enabling, the movement is first decelerated and then traversed according to the contour handwheel. Upon disabling, the movement is decelerated and the NC program is continued immediately. If the NC program is to be continued only after a new NC start, then disabling the contour handwheel in the PLC user program must be logically combined with an NC stop.	
Special cases, errors, etc.	The signal is retained beyond an NC Reset.	
See also	Table 10-305 DB3300.DBX5.0 and .2, contour handwheel 1/2/3 active (Page 299)	
More information	Function Manual SINUMERIK 828D basic functions	

Table 10-261 DB3200.DBX14.3 and .4, contour handwheel simulation on / contour handwheel simulation, negative direction

DB3200.DBX14.3 **DB3200.DBX14.4**	**Contour handwheel simulation on** **Contour handwheel simulation, negative direction** **Signals to NC channel: PLC → NC**	
Edge evaluation: No	Signal updated: cyclic	
Description	For enabling/disabling simulation of the contour handwheel, and for definition of the traversing direction, these signals have to be set as follows: Bit 3 = 0: Simulation off Bit 3 = 1: Simulation on Bit 4 = 0: Direction as programmed Bit 4 = 1: Direction opposite to what was programmed	
Application	During simulation, the feedrate is no longer defined by the contour handwheel, but traversing occurs with the programmed feedrate on the contour. If the function is deselected, the current motion is decelerated along the braking ramp. When the traversing direction is reversed, axis motion is decelerated along the braking ramp and the axis traverses in the opposite direction.	
Special cases, errors, etc.	Simulation is only effective in AUTOMATIC mode and can only be activated when the contour handwheel is activated.	
More information	Function Manual SINUMERIK 828D basic functions	

Table 10-262 DB3200.DBX14.5, activate associated M01

DB3200.DBX14.5	**Activate associated `M01`** **Signals to NC channel: PLC → NC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	PLC signals to the NC that the associated `M01` (auxiliary function) should be activated.	
Signal state 0	The associated `M01` (auxiliary function) is deactivated.	
See also	Table 10-325 DB3300.DBX4002.5, associated M01/M00 active (Page 308)	
More information	Function Manual SINUMERIK 828D Axes and Spindles	

DB3200.DBX14.6, JOG circular travel

Table 10-263 DB3200.DBX14.5, JOG circular travel

DB3200.DBX14.6	**JOG circular travel** **Signals to NC channel: PLC → NC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The "Circular travel in JOG" function is requested.	
Signal state 0	The "Circular travel in JOG" function is **not** requested.	

DB3200.DBX14.6	JOG circular travel Signals to NC channel: PLC → NC
	As soon as the function is active (see DB3300.DBB4005.6 (Page 310)), the machine operator can simultaneously traverse the two geometry axes of the active plane along an arc using the traverse keys or handwheel. **Application** This function is used for machine tools that are exclusively operated manually. **Note** The following preconditions applying for the "Circular travel in JOG" function: • The "Circular travel in JOG" function can be activated only in the JOG mode. The function cannot be activated if the machine functions JOG-REPOS and JOG-REF are active. • The axes that participate in traversing must be referenced. • The active plane must not be inclined.
See also	DB3300.DBB4005.6, JOG circular travel active (Page 310)
More information	Function Manual SINUMERIK 828D Axes and Spindles

DB320x.DBX15.5, invert contour handwheel direction of rotation

Table 10-264 DB320x.DBX15.5, contour handwheel: Invert handwheel direction of rotation

DB320x.DBX15.5	Contour handwheel: Invert handwheel direction of rotation Signals to NC channel: PLC → NC
Update	cyclic
Signal state 1	A request has been made to invert the direction of rotation of the contour handwheel.
Signal state 0	A request has **not** been made to invert the direction of rotation of the contour handwheel.
Description	**Note** It is only permissible to change the interface signal when the axis is at a standstill.
Corresponds with	DB330x.DBX7.5 (contour handwheel: handwheel direction of rotation inversion active)
More information	Function Manual SINUMERIK 828D Axes and Spindles

Table 10-265 DB3200.DBX15.6 and .7, skip block active /8 and /9

DB3200.DBX15.6 and .7	Skip block active /8 and /9 Signals to NC channel: PLC → NC	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	Blocks marked in the part program with a slash (/) are skipped. If there is a series of skip blocks, this signal is only active if it is present before decoding of the first block of the series, ideally before "NC start".	
Signal state 0	The marked part program blocks are not skipped.	
See also	Table 10-125 DB1700.DBX2.0 to 3.1, skip block selected (Page 218)	
More information	Function Manual SINUMERIK 828D basic functions	

Table 10-266 DB3200.DBX16.0, control program branching

DB3200.DBX16.0	**Control program branching** **Signals to NC channel: PLC → NC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	GOTOS in the part program initiates a return to the program start. The program is then processed again.	
Signal state 0	GOTOS initiates no return. Program execution is continued with the next part program block after GOTOS.	
See also	MD27860 $MC_PROCESSTIMER_MODE MD27880 $MC_PART_COUNTER	
More information	Function Manual SINUMERIK 828D Axes and Spindles	

DB320x.DBX17.0 to .7, value from PLC for NC grinding inputs $AC_IN_KEY_G 1 to 8

Table 10-267 DB320x.DBX17.0 to .7, input signal 1 to 8

DB320x.DBX17.0 to .7	**Input signal 1 to 8** **Signals to NC channel: PLC → NC**
Update	cyclic
Signal state 1	The value of the input signal is 1 (TRUE).
Signal state 0	The value of the input signal is 0 (FALSE).
Description	Application: Grinding
Corresponds with	$AC_IN_KEY_G_ENABLE[1 to 8] (input signal 1 to 8 enable on the NC side)
More information	Function Manual SINUMERIK 828D synchronized actions

DB320x.DBX18.0 to .7, disabling of the digital NC grinding inputs from PLC 1 to 8

Table 10-268 DB320x.DBX18.0 to .7, disabling of the input signals 1 to 8

DB320x.DBX18.0 to .7	**Disabling of the input signals 1 to 8** **Signals to NC channel: PLC → NC**
Update	cyclic
Signal state 1	The input signal is inhibited.
Signal state 0	The input signal is enabled.
Description	Application: Grinding
Corresponds with	DB320x.DBX17.0 to .7 (input signals 1 - 8) DB320x.DBX19.0 to .7 (release of the action) $AC_IN_KEY_G_ENABLE[1 to 8] (input signal 1 to 8 enable on the NC side)
More information	Function Manual SINUMERIK 828D synchronized actions

DB320x.DBX19.0 to .7, status of the digital NC grinding outputs from PLC $AC_IN_KEY_G_RUN_IN 1 to 8

Table 10-269 DB320x.DBX19.0 to .7, status of action 1 to 8

DB320x.DBX19.0 to .7	**Status of action 1 to 8** **Signals to NC channel: PLC → NC**
Update	cyclic
Signal state 1	The action is enabled.
Signal state 0	The action is inhibited.
Description	Application: Grinding
Corresponds with	DB330x.DBX4011.0 to .7 (enable request for the action on the NC side) $AC_IN_KEY_G_RUN_OUT[1 to 8] (enable request of action 1 to 8 on the NC side) $AC_IN_KEY_G_RUN_IN[1to 8] (enable of action 1 to 8 on the PLC side)
More information	Function Manual SINUMERIK 828D synchronized actions

Control signals to axes in the WCS

Table 10-270 DB3200.DBX1000.0 to .2, 1004.0 to .2, 1008.0 to .2, activate handwheel 1/2/3 for axes in the WCS

DB3200.DBX1000.0 to .2 **DB3200.DBX1004.0 to .2** **DB3200.DBX1008.0 to .2**	**Activate handwheel 1/2/3 for axis 1 in the WCS** **Activate handwheel 1/2/3 for axis 2 in the WCS** **Activate handwheel 1/2/3 for axis 3 in the WCS** **Signals to NC channel: PLC → NC**
Edge evaluation: No	Signal updated: cyclic
Signal state 1	These interface signals determine whether this geometry axis is assigned to handwheel 1/2/3 or no handwheel. Only one handwheel can be assigned to an axis at any one time. If several "Activate handwheel" interface signals are set, then 'Handwheel 1' has a higher priority than 'Handwheel 2' before 'Handwheel 3'. Note: Two geometry axes can be simultaneously traversed using handwheels 1 to 3!
Signal state 0	Neither handwheel 1, 2 or 3 is assigned to this axis.
Application	The PLC user program can use this signal to interlock the control on the geometry axis when turning a handwheel.
See also	Table 10-316 DB3300.DBX1000.0 to .2, 1004.0 to .2, 1008.0 to .2, handwheel 1/2/3 active for axes in the WCS (Page 304)
More information	• Function Manual SINUMERIK 828D Axes and Spindles

Table 10-271 DB3200.DBX1000.3, 1004.3, 1008.3, feed stop for axes in the WCS

DB3200.DBX1000.3 **DB3200.DBX1004.3** **DB3200.DBX1008.3**	**Feed stop for axis 1 in the WCS** **Feed stop for axis 2 in the WCS** **Feed stop for axis 3 in the WCS** **Signals to NC channel: PLC → NC**
Edge evaluation: No	Signal updated: cyclic
Signal state 1	The signal is only active in JOG mode (axes are traversed in the WCS). • The signal triggers a feed stop for the relevant axis. This signal brings all traversing axes to a standstill with controlled braking (ramp stop). No alarm is output. • The position control is retained, i.e. the following error is eliminated. • If a travel request is issued for an axis with an active "Feed stop", this is retained. This queued travel request is executed immediately after the "Feed stop" is canceled.
Signal state 0	• The feed is enabled for the axis. • If a travel request ("Travel command") is active when the "Feed stop" is canceled, this is executed immediately.
More information	• Function Manual SINUMERIK 828D Axes and Spindles

Table 10-272 DB3200.DBX1000.4, 10004.4, 1008.4, traversing key disable for axes in the WCS

DB3200.DBX1000.4 **DB3200.DBX1004.4** **DB3200.DBX1008.4**	**Traversing key disable for axis 1 in the WCS** **Traversing key disable for axis 2 in the WCS** **Traversing key disable for axis 3 in the WCS** **Signals to NC channel: PLC → NC**
Edge evaluation: No	Signal updated: cyclic
Signal state 1	The plus and minus traversing keys have no effect on the relevant geometry axis. It is therefore not possible, for example, to traverse the geometry axis in JOG mode with the traversing keys on the MCP. If the traversing key disable is activated while traversing, the geometry axis is stopped.
Signal state 0	The plus and minus traversing keys are enabled.
Application	It is thus possible, depending on the operating state, to disable traversing of the geometry axis in JOG mode with the traversing keys from the PLC user program.
See also	Table 10-274 DB3200.DBX1000.7 and .6, 1004.7 and .6, 1008.7 and .6, plus and minus traversing keys for axes in the WCS (Page 286)
More information	• Function Manual SINUMERIK 828D Axes and Spindles

Table 10-273 DB3200.DBX1000.5, 1004.5, 1008.5, rapid traverse override for axes in the WCS

DB3200.DBX1000.5 **DB3200.DBX1004.5** **DB3200.DBX1008.5**	**Rapid traverse override for axis 1 in the WCS** **Rapid traverse override for axis 2 in the WCS** **Rapid traverse override for axis 3 in the WCS** **Signals to NC channel: PLC → NC**
Edge evaluation: No	Signal updated: cyclic
Signal state 1	If, together with the "Traversing key plus" or "Traversing key minus", the PLC interface signal "Rapid traverse override" is issued, then the geometry axis that is addressed traverses with the rapid traverse - intended for JOG - of the associated machine axis, e.g.: X → X1. This rapid traverse velocity is defined with MD32010 $MA_JOG_VELO_RAPID. The rapid traverse override is effective in JOG mode for the following versions: • For continuous travel • For incremental travel If rapid traverse override is active, the velocity can be controlled with the rapid traverse override switch.
Signal state 0	The geometry axis traverses with the specified JOG velocity • SD41110 $SN_JOG_SET_VELO: Axis velocity for JOG or • MD32020 $MA_JOG_VELO: Conventional axis velocity
Signal irrelevant for ...	• AUTOMATIC and MDI modes • Reference point approach, JOG mode
See also	Table 10-274 DB3200.DBX1000.7 and .6, 1004.7 and .6, 1008.7 and .6, plus and minus traversing keys for axes in the WCS (Page 286)
More information	• Function Manual SINUMERIK 828D Axes and Spindles

Table 10-274 DB3200.DBX1000.7 and .6, 1004.7 and .6, 1008.7 and .6, plus and minus traversing keys for axes in the WCS

DB3200.DBX1000.7 and .6 **DB3200.DBX1004.7 and .6** **DB3200.DBX1008.7 and .6**	**Plus and minus traversing keys for axis 1 in the WCS** **Plus and minus traversing keys for axis 2 in the WCS** **Plus and minus traversing keys for axis 3 in the WCS** **Signals to NC channel: PLC → NC**
Edge evaluation: Yes	Signal updated: cyclic
Edge change 0 → 1	The selected axis can be traversed in both directions in JOG mode using the plus and minus traversing keys. Incremental travel: With signal state 1, the axis starts to traverse the set increment. If the signal changes to the 0 state before the increment is traversed, the traversing is interrupted. When the signal state changes to 1 again, the traversing is continued. The axis can be stopped and started several times as described above until it has traversed the complete increment. Continuous travel: If an INC dimension has not been selected, but instead "Continuous", then the axis traverses as long as the traversing key is kept pressed. If both traversing signals (plus and minus) are set at the same time, no traversing occurs, or traversing is aborted! The effect of the traversing keys can be disabled for every axis individually with the "Traversing key disable" PLC interface signal. Notice: In contrast to machine axes, only one geometry axis can be traversed at any one time using the traversing keys with geometry axes. Alarm 20062 is triggered if an attempt is made to traverse more than one axis with the traversing keys.
Edge change 1 → 0	No traversing.
Signal irrelevant for ...	AUTOMATIC and MDI modes.
Special cases, errors, etc.	The geometry axis cannot be traversed in JOG mode: • If it is already being traversed via the axis-specific PLC interface (as a machine axis). • If another geometry axis is already being traversed with the traversing keys. Alarm 20062 "Axis %2 already active" is output.
See also	Table 10-361 DB380x.DBX4.7 and .6, plus and minus traversing keys for axes in the WCS (Page 330) Table 10-272 DB3200.DBX1000.4, 10004.4, 1008.4, traversing key disable for axes in the WCS (Page 284)
More information	• Function Manual SINUMERIK 828D Axes and Spindles

Table 10-275 DB3200.DBX1001.0 to .6, 1005.0 to .6, 1009.0 to .6, machine functions INC1 to INCvar

DB3200.DBX1001.0 to .6 **DB3200.DBX1005.0 to .6** **DB3200.DBX1009.0 to .6**	**Machine functions INC1, INC10, INC100, INC1000, INC10000, INCvar, continuous** **For axis 1 in the WCS** **For axis 2 in the WCS** **For axis 3 in the WCS** **Signals to NC channel: PLC → NC**
Edge evaluation: No	Signal updated: cyclic
Signal state 1	This input range is only used if the "INC inputs active in the mode area" signal is not set. The "INC..." signal specifies how many increments the geometry axis traverses when the traversing key is pressed or the handwheel is turned one detent position. In this case, JOG mode must be active. The SD41010 $SN_JOG_VAR_INCR_SIZE value generally applies for "INCvar". With "Continuous", the associated geometry axis can be traversed with the plus or minus traversing key as long as the key is pressed. As soon as the selected machine function becomes active, this is signaled to the "Active machine function INC1; ..." signal. If several machine function signals, e.g. "INC1, INC..." or "Continuous travel", are selected at the interface simultaneously, no machine function is activated by the control. Note: The "INC..." or "Continuous" input signal to change an active machine function must be present for at least one PLC cycle. A steady-state signal is not required.
Signal state 0	The relevant machine function is not selected. No request is made to change an active machine function. If an axis is currently traversing an increment, the motion is also aborted if this machine function is deselected or switched over.
See also	Table 10-319 DB3300.DBX1001.0 to .6, 1005.0 to .6, 1009.0 to .6, machine functions INC1 ... continuous for axes in the WCS (Page 305) Table 10-181 DB2600.DBX1.0, INC inputs in the mode signal range active (Page 241)
More information	• Function Manual SINUMERIK 828D Axes and Spindles

DB320x.DBX1003.0, invert handwheel direction of rotation

Table 10-276 DB320x.DBX1003.0, geometry axis 1: Invert handwheel direction of rotation

DB320x.DBX1003.0	**Geometry axis 1: Invert handwheel direction of rotation** **Signals to NC channel: PLC → NC**
Update	cyclic
Signal state 1	A request has been made to invert the direction of rotation of the handwheel assigned to the geometry axis.
Signal state 0	A request has **not** been made to invert the direction of rotation of the handwheel assigned to the geometry axis.
Description	**Note** It is only permissible to change the interface signal when the geometry axis is at a standstill. **Application examples** • The direction of movement of the handwheel does not match the expected direction of the axis. • A handwheel is assigned to several axes with different orientations.

DB320x.DBX1003.0	**Geometry axis 1: Invert handwheel direction of rotation** **Signals to NC channel: PLC → NC**
Corresponds with	DB320x.DBX1007.0 (Geometry axis 2: invert handwheel direction of rotation) DB320x.DBX1011.0 (Geometry axis 3: invert handwheel direction of rotation) DB330x.DBX1003.0 (Geometry axis 1: handwheel direction of rotation inversion active) DB330x.DBX1007.0 (Geometry axis 2: handwheel direction of rotation inversion active) DB330x.DBX1011.0 (Geometry axis 3: handwheel direction of rotation inversion active)
More information	• Function Manual SINUMERIK 828D Axes and Spindles

DB320x.DBX1007.0, invert handwheel direction of rotation

Table 10-277 DB320x.DBX1007.0, geometry axis 2: Invert handwheel direction of rotation

DB320x.DBX1007.0	**Geometry axis 2: Invert handwheel direction of rotation** **Signals to NC channel: NC → PLC**
Update	cyclic
Signal state 1	A request has been made to invert the direction of rotation of the handwheel assigned to the geometry axis.
Signal state 0	A request has **not** been made to invert the direction of rotation of the handwheel assigned to the geometry axis.
Description	**Note** It is only permissible to change the interface signal when the geometry axis is at a standstill. **Application examples** • The direction of movement of the handwheel does not match the expected direction of the axis. • A handwheel is assigned to several axes with different orientations.
Corresponds with	DB320x.DBX1003.0 (Geometry axis 1: invert handwheel direction of rotation) DB320x.DBX1011.0 (Geometry axis 3: invert handwheel direction of rotation) DB330x.DBX1003.0 (Geometry axis 1: handwheel direction of rotation inversion active) DB330x.DBX1007.0 (Geometry axis 2: handwheel direction of rotation inversion active) DB330x.DBX1011.0 (Geometry axis 3: handwheel direction of rotation inversion active)
More information	• Function Manual SINUMERIK 828D Axes and Spindles

DB320x.DBX1011.0, invert handwheel direction of rotation

Table 10-278 DB320x.DBX1011.0, geometry axis 3: Invert handwheel direction of rotation

DB320x.DBX1011.0	**Geometry axis 3: Invert handwheel direction of rotation** **Signals to NC channel: PLC → NC**
Update	cyclic
Signal state 1	A request has been made to invert the direction of rotation of the handwheel assigned to the geometry axis.
Signal state 0	A request has **not** been made to invert the direction of rotation of the handwheel assigned to the geometry axis.

DB320x.DBX1011.0	Geometry axis 3: Invert handwheel direction of rotation Signals to NC channel: PLC → NC
Description	**Note** It is only permissible to change the interface signal when the geometry axis is at a standstill. **Application examples** • The direction of movement of the handwheel does not match the expected direction of the axis. • A handwheel is assigned to several axes with different orientations
Corresponds with	DB320x.DBX1003.0 (Geometry axis 1: invert handwheel direction of rotation) DB320x.DBX1007.0 (Geometry axis 2: invert handwheel direction of rotation) DB330x.DBX1003.0 (Geometry axis 1: handwheel direction of rotation inversion active) DB330x.DBX1007.0 (Geometry axis 2: handwheel direction of rotation inversion active) DB330x.DBX1011.0 (Geometry axis 3: handwheel direction of rotation inversion active)
More information	• Function Manual SINUMERIK 828D Axes and Spindles

10.2.5.2 Signals from the NC channel

Status signals from NC channel

DB330x.DBX0.1, travel backward active

Table 10-279 DB330x.DBX0.1, RESU: Retrace mode active

DB330x.DBX0.1	RESU: Retrace mode active Signals from NC channel: NC → PLC
Edge evaluation:	No
Update	cyclic
Signal state 1	The retrace mode is active.
Signal state 0	The retrace mode is **not** active.
Description	The interface signal is set if DB320x.DBX0.1 == 1 The interface signal is reset if DB320x.DBX0.2 == 1
Corresponds with	DB320x.DBX0.1 (RESU: backward/forward) DB320x.DBX0.2 (RESU: start retrace support) DB330x.DBX0.1 (RESU: retrace mode active) DB330x.DBX0.2 (RESU: retrace support active)

DB330x.DBX0.2, travel forward active

Table 10-280 DB330x.DBX0.2, RESU: Retrace support active

DB330x.DBX0.2	**RESU: Retrace support active** **Signals from NC channel: NC → PLC**
Edge evaluation:	No
Update	cyclic
Signal state 1	Retrace support active
Signal state 0	Retrace support is **not** active.
Description	The interface signal is set if DB320x.DBX0.2 == 1 is identified. The interface signal is reset if the last action block has been completed.
Corresponds with	DB320x.DBX0.1 (RESU: backward/forward) DB320x.DBX0.2 (RESU: start retrace support) DB330x.DBX0.1 (RESU: retrace mode active) DB330x.DBX0.2 (RESU: retrace support active)

Table 10-281 DB3300.DBX0.3, action block active

DB3300.DBX0.3	**Action block active** **Signals from channel: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The action block is being processed.	
Signal state 0	No action block active.	
More information	• Function Manual SINUMERIK 828D basic functions	

Table 10-282 DB3300.DBX0.4, retraction block active

DB3300.DBX0.4	**Retraction block active** **Signals from NC channel: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The approach block to continue the program with "Block search with computation on contour" is active, because no separate approach block is created with "Block search with computation on block end point". The axes are automatically positioned on the collected search position if the ASUB is exited with REPOSA during "Block search with computation on contour".	
Signal state 0	The search target was found during "Block search with computation on contour".	
More information	• Function Manual SINUMERIK 828D basic functions	

Table 10-283 DB3300.DBX0.5, M0/M1 active

DB3300.DBX0.5	**M00/M01 active** **Signals from NC channel: NC → PLC**
Edge evaluation: No	Signal updated: cyclic
Signal state 1	The part program block is processed, the auxiliary functions are output, and: • M00 is in the work memory • M01 is in the work memory and the "Activate M01" signal is active The program status changes to "Stopped".
Signal state 0	• With "NC start" signal • For a program abort as a result of a reset

Application

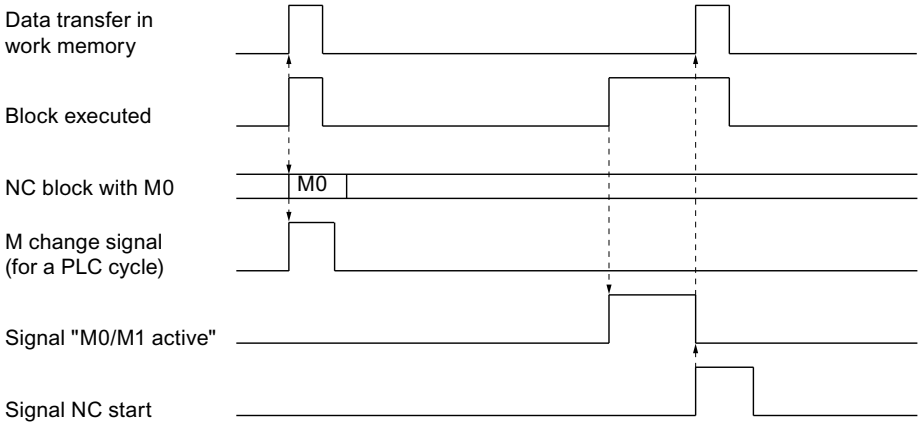


Figure 10-4 M0_M1_active

See also

Table 10-232 DB3200.DBX0.5, activate M01 (Page 263)

Table 10-121 DB1700.DBX0.5, M01 selected (Page 216)

More information

- Function Manual SINUMERIK 828D basic functions

Table 10-284 DB3300.DBX0.6, last action block active

DB3300.DBX0.6	**Last action block active** **Signals from NC channel: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The last action block is being processed. This means that all the action blocks on the NC have been processed and the actions by the PLC (ASUB, FC) or by the operator, such as overstore, mode change according to JOG/REPOS are possible. This allows the PLC to perform another tool change, for example, before the start of the motion.	
Signal state 0	The last action block is not being processed.	
More information	• Function Manual SINUMERIK 828D basic functions	

Table 10-285 DB3300.DBX1.0, referencing active

DB3300.DBX1.0	**Referencing active** **Signals from NC channel: NC → PLC**	
Edge evaluation: Yes	Signal updated: cyclic	
Edge change 0 → 1	The channel-specific referencing was started using the "Activate referencing" signal and the successful start was acknowledged with the "Referencing active" signal. The channel-specific referencing is running.	
Edge change 1 → 0	• Channel-specific referencing has been completed • Axis-specific referencing is running • No referencing active	
Signal irrelevant for ...	Spindles	
See also	Table 10-234 DB3200.DBX1.0, activate referencing (Page 264)	
More information	• Function Manual SINUMERIK 828D Axes and Spindles	

Table 10-286 DB3300.DBX1.2, revolutional feedrate active

DB3300.DBX1.2	**Revolutional feedrate active** **Signals from NC channel: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	AUTOMATIC mode is selected by the PLC program.	
Signal state 0	AUTOMATIC mode is not selected by the PLC program.	
Signal irrelevant for ...	"Mode change disable" signal	
See also	Table 10-221 DB3100.DBX0.0, active AUTOMATIC mode (Page 259) Table 10-214 DB3000.DBX0.4, mode change disable (Page 256)	
More information	• Function Manual SINUMERIK 828D basic functions	

Table 10-287 DB3300.DBX1.3, handwheel override active

DB3300.DBX1.3	**Handwheel override active** **Signals from NC channel: NC → PLC**
Edge evaluation: No	Signal updated: cyclic
Signal state 1	The "Handwheel override in Automatic mode" function is active for the programmed path axes. Handwheel pulses of the 1st geometry axis function as a velocity override on the programmed path velocity.
Signal state 0	Path axes are not active. An active handwheel override becomes inactive when the following occurs: • The path axes have reached the programmed target position. • The distance-to-go is deleted by the channel-specific "Delete distance-to-go" signal. • A reset is performed.
See also	Table 10-244 DB3200.DBX6.2, delete distance-to-go (Page 271)
More information	• Function Manual SINUMERIK 828D Axes and Spindles

Table 10-288 DB3300.DBX1.4, block search active

DB3300.DBX1.4	**Block search active** **Signals from NC channel: NC → PLC**
Edge evaluation: No	Signal updated: cyclic
Signal state 1	The block search function is active. It was selected and started from the operator interface.
Signal state 0	The block search function is not active.
Application	The block search function makes it possible to jump to a certain block within a part program and to start processing the part program from this block.
Signal irrelevant for ...	"Mode change disable" signal
More information	• Function Manual SINUMERIK 828D basic functions

Table 10-289 DB3300.DBX1.5, M2/M30 active

DB3300.DBX1.5	**M2/M30 active** **Signals from NC channel: NC → PLC**
Edge evaluation: No	Signal updated: cyclic
Signal state 1	NC block with M2 has been completely executed. If traversing motion is also programmed in this block, the signal is only output when the target position has been reached.
Signal state 0	• No end of program or program abort • State after the control has been switched on • Start of an NC program
Special cases, errors, etc.	• The M2 and M30 functions have equal priority. Only M2 should be used. The "M2/M30 active" signal is present as a steady-state signal after the end of the program. • Not suitable for automatic follow-on functions such as workpiece counting, bar feed, etc. For these functions, M2 must be written in a separate block and the word M2 or the decoded M signal used. • Auxiliary functions must not be written in the last block of a program that should result in a read-in stop.

Application

The PLC can detect the end of program processing with this signal and react appropriately.

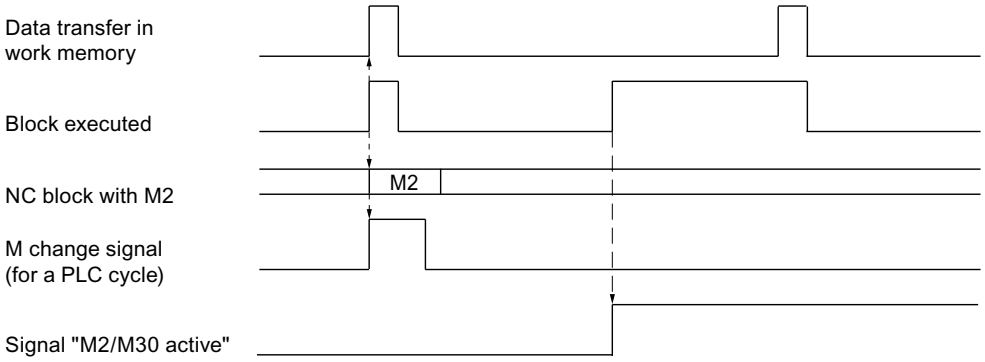


Figure 10-5 M02_M30_active

More information

- Function Manual SINUMERIK 828D basic functions

Table 10-290 DB3300.DBX1.6, transformation active

DB3300.DBX1.6	**Transformation active** **Signals from NC channel: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The TRANSMIT or TRACYL NC command is programmed in the part program. The corresponding block has been processed by the NC and a transformation is now active.	
Signal state 0	No transformation is active.	
See also	Table 10-334 DB3300.DBB4008, index number of the active transformation in the channel (Page 311)	
More information	• Function Manual SINUMERIK 828D basic functions	

See also

DB3300.DBB4008, index number of the active transformation (Page 311)

Table 10-291 DB3300.DBX1.7, program test active

DB3300.DBX1.7	**Program test active** **Signals from NC channel: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The "Program test" program control is active. An axis disable is set internally for all axes (not spindles). Therefore, the machine axes do not move when a part program block or a part program is being processed. The axis movements are simulated on the user interface with changing axis position values. The axis position values for the display are generated from the calculated setpoints. The part program is processed in the normal way.	

DB3300.DBX1.7	**Program test active** **Signals from NC channel: NC → PLC**
Signal state 0	The "Program test" program control is not active.
See also	Table 10-124 DB1700.DBX1.7, program test selected (Page 217) Table 10-238 DB3200.DBX1.7, activate program test (Page 265)
More information	• Function Manual SINUMERIK 828D basic functions

Table 10-292 DB3300.DBX3.0, program status running

DB3300.DBX3.0	**Program status running** **Signals from NC channel: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The part program was started with the "NC start" signal and is running.	
Signal state 0	• Program stopped by `M00/M01` or NC stop or mode change • The block is executed in single block mode • End of program reached (`M02`) • Program aborted due to a reset • The current block cannot be executed	
Signal irrelevant for ...	"Mode change disable" signal	
Special cases, errors, etc.	The "Program status running" signal does not change to 0 if workpiece machining is stopped due to the following events: • A feed disable or spindle disable was output • "Read-in disable" signal • Feedrate override at 0% • The spindle and axis monitoring functions respond	
More information	• Function Manual SINUMERIK 828D basic functions	

Table 10-293 DB3300.DBX3.1, program status wait

DB3300.DBX3.1	**Program status wait** **Signals from NC channel: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The running program has reached the `WAIT_M` or `WAIT_E` program command in an NC block. The wait condition specified in the `WAIT` command for the channel or channels has not yet been fulfilled.	
Signal state 0	Program status wait is not active.	
More information	• Programming Manual SINUMERIK 828D NC programming	

Table 10-294 DB3300.DBX3.2, program status stopped

DB3300.DBX3.2	**Program status stopped** **Signals from NC channel: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The NC part program has been stopped by: • "NC stop" • "NC stop axes plus spindles" • "NC stop at block limit" • Programmed `M00` or `M01` or • Single block mode	
Signal state 0	The "Program status stopped" signal is not present.	
See also	Table 10-251 DB3200.DBX7.3, NC stop (Page 273) Table 10-252 DB3200.DBX7.4, NC stop axes plus spindles (Page 274) Table 10-250 DB3200.DBX7.2, NC stop at block limit (Page 273)	
More information	• Function Manual SINUMERIK 828D basic functions	

Table 10-295 DB3300.DBX3.3, program status interrupted

DB3300.DBX3.3	**Program status interrupted** **Signals from NC channel: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	When the mode changes from AUTOMATIC or MDI (in stopped program status) to JOG, the program status changes to "interrupted". The program can be continued at the point of interruption in AUTOMATIC or MDI mode when "NC start" is issued.	
Signal state 0	Program status interrupted is not active.	
Signal irrelevant for ...	"Mode change disable" signal	
More information	• Function Manual SINUMERIK 828D basic functions	

Table 10-296 DB3300.DBX3.4, program status aborted

DB3300.DBX3.4	**Program status aborted** **Signals from NC channel: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The program has been selected but not started, or the program was aborted with a reset.	
Signal state 0	Program status interrupted is not active.	
See also	Table 10-147 DB1800.DBX0.7, reset (Page 226)	
More information	• Function Manual SINUMERIK 828D basic functions	

Table 10-297 DB3300.DBX3.5, channel status active

DB3300.DBX3.5	**Channel status active** **Signals from NC channel: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	In this channel • A part program or block is being executed in AUTOMATIC or MDI mode. • At least one axis is being traversed in JOG mode.	
Signal state 0	"Channel status interrupted" signal or "Channel status reset" is present	
More information	• Function Manual SINUMERIK 828D basic functions	

Table 10-298 DB3300.DBX3.6, channel status interrupted

DB3300.DBX3.6	**Channel status interrupted** **Signals from NC channel: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The NC part program in AUTOMATIC or MDI mode can be interrupted by the following: • "NC stop" signal • "NC stop axes plus spindles" signal • "NC stop at block limit" signal • Programmed `M00` or `M01` or • "Single block mode" With an NC start, the part program or the interrupted traversing can be continued.	
Signal state 0	"Channel status active" signal or "Channel status reset" is present	
More information	• Function Manual SINUMERIK 828D basic functions	

Table 10-299 DB3300.DBX3.7, channel status reset

DB3300.DBX3.7	**Channel status reset** **Signals from NC channel: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The signal is set to 1 as soon as the channel goes into the reset state, i.e. no processing taking place.	
Signal state 0	The signal is set to 0 as soon as processing takes place in the channel, e.g. a part program is being executed or block search.	
More information	• Function Manual SINUMERIK 828D basic functions	

Table 10-300 DB3300.DBX4.2, all axes that have to be referenced are referenced

DB3300.DBX4.2	**All axes that have to be referenced are referenced** **Signals from NC channel: NC → PLC**
Edge evaluation: No	Signal updated: cyclic
Signal state 1	All axes of the channel that have to be referenced are referenced. The machine data: MD20700 $MC_REFP_NC_START_LOCK: (NC start disable without reference point) is zero. If two position measuring systems are connected to an axis that would prevent an NC start, then the active one must be referenced so that the axis is considered to have been referenced. An NC Start command for the part program processing is only accepted when this signal is present. Axes have to be referenced when the following is present: • MD34110 $MA_REFP_CYCLE_NR _ = -1 and • The axis is not in parking (position measuring systems inactive and controller enable signal canceled).
Signal state 0	One or more axes of the channel that have to be referenced are not referenced.
Special cases, errors, etc.	The spindles of the channel have no effect on this interface signal.
See also	Table 10-405 DB390x.DBX0.4, referenced/synchronized 1 (Page 354)
More information	• Function Manual SINUMERIK 828D Axes and Spindles

Table 10-301 DB3300.DBX4.3, all axes stationary

DB3300.DBX4.3	**All axes stationary** **Signals from NC channel: NC → PLC**
Edge evaluation: No	Signal updated: cyclic
Signal state 1	All axes of the channel are stationary with interpolator end. No other traversing motions are active.
More information	• Function Manual SINUMERIK 828D basic functions

DB330x.DBX4.5, channel ready

Table 10-302 DB330x.DBX4.5, channel ready

DB330x.DBX4.5	**Channel is ready** **Signals from NC channel: NC → PLC**
Update	cyclic
Signal state 1	The channel is ready
Signal state 0	The channel is **not** ready.
Description	The channel is ready to execute an NC program and to traverse axes and spindle that are assigned to the channel.
Corresponds with	MD11600 $MN_BAG_MASK (definition of the mode group response)
More information	• Function Manual SINUMERIK 828D basic functions

Table 10-303 DB3300.DBX4.6, channel-specific NC alarm is present

DB3300.DBX4.6	**Channel-specific NC alarm is present** **Signals from NC channel: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	At least one NC alarm is present for the channel. This also sets the signal "NC alarm present". The PLC user program can use the "NC alarm with processing stop present" signal to query whether processing for the relevant channel has been interrupted because of an NC channel.	
Signal state 0	An NC alarm is not present for the channel.	
See also	Table 10-304 DB3300.DBX4.7, NC alarm with processing stop present (Page 299) Table 10-192 DB2700.DBX3.0, NC alarm is present (Page 245) DB330x.DBX4.5, channel ready (Page 298)	
More information	• Function Manual SINUMERIK 828D Axes and Spindles	

Table 10-304 DB3300.DBX4.7, NC alarm with processing stop present

DB3300.DBX4.7	**NC alarm with processing stop present** **Signals from NC channel: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	At least one NC alarm which is causing a processing stop of the part program running in this channel is present.	
Signal state 0	There is no NC alarm present in this channel that is causing a processing stop.	
See also	Table 10-192 DB2700.DBX3.0, NC alarm is present (Page 245)	
More information	• Diagnostics Manual for SINUMERIK 828D SINAMICS S120 alarms	

Table 10-305 DB3300.DBX5.0 and .2, contour handwheel 1/2/3 active

DB3300.DBX5.0 **DB3300.DBX5.1** **DB3300.DBX5.2**	**Contour handwheel 1 active** **Contour handwheel 2 active** **Contour handwheel 3 active** **Signals from NC channel: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	Handwheel 1/2/3 is assigned to a geometry axis. Only one contour handwheel can be assigned to an axis at any one time. If several "Activate handwheel 1/2/3 as contour handwheel" interface signals are set, priority "Contour handwheel 1" before "Contour handwheel 2" before "Contour handwheel 3" applies. If the assignment is active, the geometry axis can be traversed in JOG mode with the contour handwheel or a DRF offset can be generated in AUTOMATIC or MDI modes.	
Signal state 0	Handwheel 1/2/3 is not assigned to a geometry axis.	
See also	Table 10-260 DB3200.DBB14.0 and .2, activate handwheel 1/2/3 as contour handwheel (Page 279)	
More information	• Function Manual SINUMERIK 828D basic functions	

Table 10-306 DB3300.DBX7.1, NC alarm with program stop

DB3300.DBX7.1	**NC alarm with program stop** **Signals from NC channel: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The interface signal indicates when the program progress is blocked by the presence of an alarm. This relates to all alarms generated by stop response: • Stop on the path with deletion of the ready signal • Axes are braked • Immediate stop on the path • Interpreter is stopped, IPO buffer is still being executed • No stop at end of block Alarms with the following alarm response are also taken into account: • NC start disable in this channel • NC start disable in this channel, ASUB starts, where relevant, are permitted For alarms with this response the interface signal is not set until an NC start has been triggered and only if the alarm has not yet been acknowledged. In this case, the interface signal is not set until NC start. The interface signals are set if the start of an ASUB is refused because of an NC start disable in this channel. The interface signal is deleted as soon as alarm responses that activated the signal are no longer active. This depends on the delete conditions of the alarms.	
Signal state 0	An NC alarm is not present for the channel.	
See also	Table 10-192 DB2700.DBX3.0, NC alarm is present (Page 245) Table 10-303 DB3300.DBX4.6, channel-specific NC alarm is present (Page 299) Table 10-304 DB3300.DBX4.7, NC alarm with processing stop present (Page 299)	
More information	• Diagnostics Manual for SINUMERIK 828D SINAMICS S120 alarms	

DB3300.DBX7.3, reduced dynamic response mode is active

Table 10-307 DB3300.DBX7.3, reduced dynamic response mode is active

DB3300.DBX7.1	**Reduced dynamics mode is active** **Signals from NC channel: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	Reduced dynamics mode is active	
Signal state 0	Reduced dynamics mode is not active	

DB3300.DBX7.4, stop at block end due to single block

Table 10-308 DB3300.DBX7.4, stop at block end due to single block

DB3300.DBX7.4	**Stop at block end due to single block** **Signals from the NC channel: NC → PLC**
Edge evaluation: No	Signal updated: Cyclically
Signal state 1	Stop at block end due to single block is active.
Signal state 0	Stop at end of block due to single block is not active.

DB330x.DBX7.5, inverted contour handwheel direction of rotation

Table 10-309 DB330x.DBX7.5, contour handwheel: Handwheel direction of rotation inversion active

DB330x.DBX7.5	**Contour handwheel: Handwheel direction of rotation inversion active** **Signals from NC channel: NC → PLC**
Update	cyclic
Signal state 1	Inversion of the direction of rotation of the contour handwheel is active.
Signal state 0	Inversion of the direction of rotation of the contour handwheel is **not** active.
Corresponds with	DB380x.DBX5007.5 (contour handwheel: invert handwheel direction of rotation)
More information	• Function Manual SINUMERIK 828D Axes and Spindles

DB3300.DBX7.6, configured stop function is activated

Table 10-310 DB3300.DBX7.6, configured stop function is activated

DB3300.DBX7.6	**Configured stop function is activated** **Signals from the NC channel: NC → PLC**
Edge evaluation: No	Signal updated: Cyclically
Signal state 1	The "Configured stop" function was activated internally.
Signal state 0	The "Configured stop" function was not activated internally.
See also	DB3200.DBX7.6, configured stop function activation (Page 266)

DB3300.DBX7.7, stop at block end due to configured stop

Table 10-311 DB3300.DBX7.7, stop at block end due to configured stop

DB3300.DBX7.7	**Stop at block end due to configured stop** **Signals from the NC channel: NC → PLC**
Edge evaluation: No	Signal updated: Cyclically
Signal state 1	Stop at end of block due to configured stop

DB3300.DBX7.7	**Stop at block end due to configured stop** **Signals from the NC channel: NC → PLC**
Signal state 0	No stop at end of block due to configured stop
See also	DB320**x**.DBX7.6, configured stop function activation (Page 275) DB330x.DBX7.6, configured stop function is activated (Page 301)

Table 10-312 DB3300.DBX8.0 to 9.1, machine-related protection area 1 (...10) preactivated

DB3300.DBX8.0 to 9.1	**Machine-related protection area 1 (...10) preactivated** **Signals from NC channel: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The machine-related protection area 1 (...10) is preactivated in the current block. The preactivation was performed in the part program. This means that the protection area can be set to either active or inactive in the PLC user program via the "Activate machine-related protection area 1 (...10)" signal.	
Signal state 0	The machine-related protection area 1 (...10) is deactivated in the current block. The deactivation was performed in the part program. This means that the protection area cannot be set to either active or inactive in the PLC user program via the "Activate machine-related protection area 1 (...10)" signal.	
See also	Table 10-255 DB3200.DBX8.0 to .DBX9.1, activate machine-related protection area 1 (...10) (Page 276)	
More information	• Function Manual SINUMERIK 828D monitoring and compensating	

Table 10-313 DB3300.DBX10.0 to 11.1, channel-specific protection area 1 (...10) preactivated

DB3300.DBX10.0 to 11.1	**Channel-specific protection area 1 (...10) preactivated** **Signals from NC channel: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The channel-specific protection area 1 (...10) is preactivated in the current block. The preactivation was performed in the part program. This means that the protection area can be set to either active or inactive in the PLC user program via the "Activate channel-specific protection area 1 (...10)" signal.	
Signal state 0	The channel-specific protection area 1 (...10) is deactivated in the current block. The deactivation was performed in the part program. This means that the protection area cannot be set to either active or inactive in the PLC user program via the "Activate channel-specific protection area 1 (...10)" signal.	
See also	Table 10-256 DB3200.DBX10.0 to 11.1, activate channel-specific protection area 1 (...10) (Page 277)	
More information	• Function Manual SINUMERIK 828D monitoring and compensating	

Table 10-314 DB3300.DBX12.0 to 13.1, machine-related protection area 1 (...10) violated

DB3300.DBX12.0 to 13.1	**Machine-related protection area 1 (...10) violated** **Signals from NC channel: NC → PLC**
Edge evaluation: No	Signal updated: cyclic
Signal state 1	The activated, machine-related protection area 1 (...10) is violated in the current block or in the current JOG motion. The preactivated, machine-related protection area 1 (...10) would be violated in the current block if it would be activated by the PLC.
Signal state 0	The activated, machine-related protection area 1 (...10) is not violated in the current block. The preactivated, machine-related protection area 1 (...10) would not be violated in the current block if it would be activated by the PLC.
Application	Before parts are moved into the working area - this signal can be used to check as to whether the tool or workpiece is located in the machine-related protection area of the part to be moved in.
More information	• Function Manual SINUMERIK 828D monitoring and compensating

Table 10-315 DB3300.DBX14.0 to 15.1, channel-specific protection area 1 (...10) violated

DB3300.DBX14.0 to 15.1	**Channel-specific protection area 1 (...10) violated** **Signals from NC channel: NC → PLC**
Edge evaluation: No	Signal updated: cyclic
Signal state 1	The channel-specific protection area 1 (...10) is preactivated in the current block. The preactivation was performed in the part program. This means that the protection area can be set to either active or inactive in the PLC user program via the "Activate channel-specific protection area 1 (...10)" signal.
Signal state 0	The channel-specific protection area 1 (...10) is deactivated in the current block. The deactivation was performed in the part program. This means that the protection area can be set to inactive in the PLC user program via the "Activate channel-specific protection area 1 (...10)" signal.
See also	Table 10-256 DB3200.DBX10.0 to 11.1, activate channel-specific protection area 1 (...10) (Page 277)
More information	• Function Manual SINUMERIK 828D monitoring and compensating

Status signals axes in WCS

Table 10-316 DB3300.DBX1000.0 to .2, 1004.0 to .2, 1008.0 to .2, handwheel 1/2/3 active for axes in the WCS

DB3300.DBX1000.0 to .2 **DB3300.DBX1004.0 to .2** **DB3300.DBX1008.0 to .2**	**Handwheel 1/2/3 active for axis 1 in the WCS** **Handwheel 1/2/3 active for axis 2 in the WCS** **Handwheel 1/2/3 active for axis 3 in the WCS** **Signals from NC channel: NC → PLC**
Edge evaluation: No	Signal updated: cyclic
Signal state 1	These interface signals inform whether this geometry axis is assigned to handwheel 1/2/3 or no handwheel. Only one handwheel can be assigned to an axis at any one time. If several "Activate handwheel" signals are set, then 'Handwheel 1' has a higher priority than 'Handwheel 2' before 'Handwheel 3'. Note: If the assignment is active, then the geometry axis can be traversed using the handwheel in JOG mode.
Signal state 0	Neither handwheel 1, 2 or 3 is assigned to this geometry axis.
See also	Table 10-270 DB3200.DBX1000.0 to .2, 1004.0 to .2, 1008.0 to .2, activate handwheel 1/2/3 for axes in the WCS (Page 283)
More information	• Function Manual SINUMERIK 828D Axes and Spindles

Table 10-317 DB3300.DBX1000.5/4, 1004.5/4, 1008.5/4, plus and minus travel requests for axes in the WCS

DB3300.DBX1000.5 and 4 **DB3300.DBX1004.5 and 4** **DB3300.DBX1008.5 and 4**	**Plus and minus travel requests for axis 1 in the WCS** **Plus and minus travel requests for axis 2 in the WCS** **Plus and minus travel requests for axis 3 in the WCS** **Signals from NC channel: NC → PLC**
Edge evaluation: No	Signal updated: cyclic
Signal state 1	There is no travel request in the relevant axis direction or a traversing motion has been completed. • JOG mode: The travel command is reset depending on the "Jog or continuous mode" setting while traversing with the handwheel. • REF mode: With the plus/minus traversing key until the reference point is reached. • AUTO/MDI mode: The program block has been executed and the next block does not contain any coordinate values for the relevant axis. Cancel using reset, etc. "Axis disable" signal is present.
Signal state 0	Neither handwheel 1, 2 or 3 is assigned to this geometry axis.
See also	Table 10-318 DB3300.DBX1000.7/6, 1004.7/6, 1008.7/6, plus and minus travel command for axes in the WCS (Page 305)
More information	• Function Manual SINUMERIK 828D Axes and Spindles

Table 10-318 DB3300.DBX1000.7/6, 1004.7/6, 1008.7/6, plus and minus travel command for axes in the WCS

DB3300.DBX1000.7 and 6 **DB3300.DBX1004.7 and 6** **DB3300.DBX1008.7 and 6**	**Plus and minus travel command for axis 1 in the WCS** **Plus and minus travel command for axis 2 in the WCS** **Plus and minus travel command for axis 3 in the WCS** **Signals from NC channel: NC → PLC**
Edge evaluation: No	Signal updated: cyclic
Signal state 1	A traversing motion is to be performed in the relevant axis direction. Depending on the mode selected, the travel command is triggered in different ways. • JOG mode: With the plus or minus traversing key • REF mode: With the traversing key that takes the axis to the reference point. • AUTO/MDI mode: A program block containing a coordinate value for the relevant axis is executed.
Signal state 0	There is no travel request in the relevant axis direction or a traversing motion has been completed. • JOG mode: – When withdrawing the traversing key – When ending traversing with the handwheel • REF mode: When the reference point is reached • AUTO/MDI mode: – The program block has been executed and the next block does not contain any coordinate values for the relevant axis – Cancel using reset, etc. – "Axis disable" signal is present
Application	Releasing the clamping for axes with clamping. Note: If the clamping is not released until the travel command is given, these axes cannot be operated in path mode!
See also	Table 10-274 DB3200.DBX1000.7 and .6, 1004.7 and .6, 1008.7 and .6, plus and minus traversing keys for axes in the WCS (Page 286)
More information	• Function Manual SINUMERIK 828D Axes and Spindles

Table 10-319 DB3300.DBX1001.0 to .6, 1005.0 to .6, 1009.0 to .6, machine functions INC1 ... continuous for axes in the WCS

DB3300.DBX1001.0 to .6 **DB3300.DBX1005.0 to .6** **DB3300.DBX1009.0 to .6**	**Active machine functions INC1, INC10, INC100, INC1000, INC10000, INCvar, continuous** **For axis 1 in the WCS** **For axis 2 in the WCS** **For axis 3 in the WCS** **Signals from NC channel: NC → PLC**
Edge evaluation: No	Signal updated: cyclic
Signal state 1	The PLC interface receives a signal stating which machine function is active in JOG mode for the geometry axes.
Signal state 0	The relevant machine function is not active.

DB3300.DBX1001.0 to .6 **DB3300.DBX1005.0 to .6** **DB3300.DBX1009.0 to .6**	**Active machine functions INC1, INC10, INC100, INC1000, INC10000, INCvar, continuous** **For axis 1 in the WCS** **For axis 2 in the WCS** **For axis 3 in the WCS** **Signals from NC channel: NC → PLC**
See also	Table 10-275 DB3200.DBX1001.0 to .6, 1005.0 to .6, 1009.0 to .6, machine functions INC1 to INCvar (Page 287)
More information	• Function Manual SINUMERIK 828D Axes and Spindles

DB330x.DBX1003.0, invert handwheel direction of rotation

Table 10-320 DB330x.DBX1003.0, geometry axis 1: Handwheel direction of rotation inversion active

DB330x.DBX1003.0	**Geometry axis 1: Handwheel direction of rotation inversion active** **Signals from NC channel: NC → PLC**
Update	cyclic
Signal state 1	Inversion of the direction of rotation of the handwheel assigned to the geometry axis is active.
Signal state 0	Inversion of the direction of rotation of the handwheel assigned to the geometry axis is **not** active.
Corresponds with	DB330x.DBX1007.0 (Geometry axis 2: handwheel direction of rotation inversion active) DB330x.DBX1011.0 (Geometry axis 3: handwheel direction of rotation inversion active) DB320x.DBX1003.0 (Geometry axis 1: invert handwheel direction of rotation) DB320x.DBX1007.0 (Geometry axis 2: invert handwheel direction of rotation) DB330x.DBX1011.0 (Geometry axis 3: invert handwheel direction of rotation)
More information	• Function Manual SINUMERIK 828D Axes and Spindles

DB330x.DBX1007.0, invert handwheel direction of rotation

Table 10-321 DB330x.DBX1007.0 , geometry axis 2: Handwheel direction of rotation inversion active

DB330x.DBX1007.0	**Geometry axis 2: Handwheel direction of rotation inversion active** **Signals from NC channel: NC → PLC**
Update	cyclic
Signal state 1	Inversion of the direction of rotation of the handwheel assigned to the geometry axis is active.
Signal state 0	Inversion of the direction of rotation of the handwheel assigned to the geometry axis is **not** active.
Corresponds with	DB330x.DBX1003.0 (geometry axis 2: handwheel direction of rotation inversion active) DB330x.DBX1011.0 (Geometry axis 3: handwheel direction of rotation inversion active) DB320x.DBX1003.0 (Geometry axis 1: invert handwheel direction of rotation) DB320x.DBX1007.0 (Geometry axis 2: invert handwheel direction of rotation) DB330x.DBX1011.0 (Geometry axis 3: invert handwheel direction of rotation)
More information	• Function Manual SINUMERIK 828D Axes and Spindles

DB330x.DBX1011.0, invert handwheel direction of rotation

Table 10-322 DB330x.DBX1011.0, geometry axis 3: Handwheel direction of rotation inversion active

DB330x.DBX1011.0	**Geometry axis 3: Handwheel direction of rotation inversion active** **Signals from NC channel: NC → PLC**
Update	cyclic
Signal state 1	Inversion of the direction of rotation of the handwheel assigned to the geometry axis is active.
Signal state 0	Inversion of the direction of rotation of the handwheel assigned to the geometry axis is **not** active.
Corresponds with	DB330x.DBX1007.0 (Geometry axis 2: handwheel direction of rotation inversion active) DB330x.DBX1011.0 (Geometry axis 3: handwheel direction of rotation inversion active) DB320x.DBX1003.0 (Geometry axis 1: invert handwheel direction of rotation) DB320x.DBX1007.0 (Geometry axis 2: invert handwheel direction of rotation) DB330x.DBX1011.0 (Geometry axis 3: invert handwheel direction of rotation)
More information	• Function Manual SINUMERIK 828D Axes and Spindles

Further status signals from NC channel

Table 10-323 DB3300.DBX4001.1, workpiece setpoint reached

DB3300.DBX4001.1	**Workpiece setpoint reached** **Signals from NC channel: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The specified workpiece target has been reached. Depending on the setting in MD27880 PART_COUNTER: Bit 1 = 0: For $AC_REQUIRED_PARTS = $AC_ACTUAL_PARTS Bit 1 = 1: For $AC_REQUIRED_PARTS = $AC_SPECIAL_PARTS	
Signal state 0	The specified workpiece target has not been reached.	
More information	• Function Manual SINUMERIK 828D basic functions	

Table 10-324 DB3300.DBX4002.0, ASUB is stopped

DB3300.DBX4002.0	**ASUB is stopped** **Signals from NC channel: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The signal is set to 1 if the control stops automatically prior to the end of ASUB (interrupt in a program mode and channel status stopped).	
Signal state 0	The signal is set to 0 with start and reset.	
More information	• Programming Manual SINUMERIK 828D NC programming	

Table 10-325 DB3300.DBX4002.5, associated M01/M00 active

DB3300.DBX4002.5	**Associated M01/M00 active** **Signals from NC channel: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	An associated M00 or M01 auxiliary function is active with the appropriate previous enable/ activation.	
Signal state 0	No associated M00/M01 auxiliary function is active.	
See also	Table 10-262 DB3200.DBX14.5, activate associated M01 (Page 280)	
More information	• Function Manual SINUMERIK 828D basic functions	

Table 10-326 DB3300.DBX4002.6, dry run feedrate active

DB3300.DBX4002.6	**Dry run feedrate active** **Signals from NC channel: NC → PLC**	
Edge evaluation: No	Signals updated: cyclic	
Signal state 1	The dry run feedrate is active. Instead of the programmed feedrate, the dry run feedrate entered in the setting data: SD42100 $SC_DRY_RUN_FEED is effective. When activated from the operator panel front, the dry run feedrate signal is automatically entered in the PLC interface and transferred by the PLC user program to the "Activate dry run feedrate" signal.	
Signal state 0	Dry run feedrate is not active. The programmed feedrate is active.	
See also	Table 10-233 DB3200.DBX0.6, activate dry run feedrate (Page 263)	
More information	• Function Manual SINUMERIK 828D basic functions	

Table 10-327 DB3300.DBX4004, PROG-EVENT-DISPLAY

DB3300.DBX4004	**PROG-EVENT-DISPLAY** **Signals from NC channel: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The event assigned to the bit has activated the "Event-driven program call" function: Bit 0 → part program start from the RESET channel status Bit 1 → end of part program Bit 2 → operator panel reset Bit 3 → run-up Bit 4 → 1st Start after block search Bit 5 - 7 → reserved, currently always 0 Signal duration: At least one complete PLC cycle.	
Signal state 0	The event assigned to the bit has not activated the "Event-driven program call" function. The event-driven user program has expired or was canceled with reset.	
More information	• Function Manual SINUMERIK 828D basic functions	

DB330x.DBB4004, display of the triggering event in case of event-driven program call

Table 10-328 DB330x.DBB4004, PROG_EVENT trigger event

DB330x.DBB4004	**PROG_EVENT trigger event** **Signals from NC channel: NC → PLC**		
Update	cyclic		
Description	The event that initiated the PROG_EVENT is displayed bit-coded.		
	Bit	**Value**	**Event**
	0	1	NC start from channel state "reset"
	1	1	End of program reset (e.g. M30)
	2	1	Channel reset
	3	1	Warm restart (power on)
	4	1	1. NC start after search
	5	1	Safety
	6 - 7	---	Reserved, currently always 0
	Note As a minimum, the interface signal must remain for a complete PLC cycle.		
More information	• Function Manual SINUMERIK 828D basic functions		

Table 10-329 DB3300.DBX4005.0, collision avoidance: Stop

DB3300.DBX4005.0	**Collision avoidance: Stop** **Signals from NC channel: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The collision avoidance has triggered a stop of the traversing motion in the channel.	
Signal state 0	The collision avoidance has **not** triggered a stop of the traversing motions in the channel.	
More information	• Function Manual SINUMERIK 828D monitoring and compensating	

DB330x.DBX4005.4, JOG Retract active

Table 10-330 DB330x.DBX4005.4, JOG Retract active

DB330x.DBX4005.4	**JOG retract active** **Signals from NC channel: NC → PLC**
Update	cyclic
Signal state 1	JOG retract has been selected and is active.
Signal state 0	JOG retract has not been selected.
Corresponds with	DB330x.DBX4005.5 (JOG Retract data available)
More information	Function Manual Axes and Spindles

DB330x.DBX4005.5, retract data available

Table 10-331 DB330x.DBX4005.5, JOG Retract data available

DB330x.DBX4005.5	**JOG retract retraction data available** **Signals from NC channel: NC → PLC**
Update	cyclic
Signal state 1	Retraction data is available for traversing in the tool direction.
Signal state 0	Retraction data is not available for traversing in the tool direction. JOG retract cannot be selected
Description	If the signal state is active, then the JOG retract can be selected (user interface or PI service "RETRAC").
Corresponds with	DB330x.DBX4005.4 (JOG Retract active)
More information	• Function Manual SINUMERIK 828D Axes and Spindles

DB3300.DBB4005.6, JOG circular travel active

Table 10-332 DB3300.DBX4005.6, JOG circular travel active

DB3300.DBX4005.6	**JOG circular travel active** **Signals to NC channel: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The "Circular travel in JOG" function is active.	
Signal state 0	The "Circular travel in JOG" function is **not** active.	
See also	DB3200.DBX14.6, JOG circular travel (Page 280)	
More information	• Function Manual SINUMERIK 828D Axes and Spindles	

Table 10-333 DB3300.DBX4006.0/.1, ASUP active

DB3300.DBX4006.0/.1	**ASUB is active** **Signals from NC channel: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	An ASUB with suppressed display update is active, see MD20191.	
Signal state 0	No ASUB with suppressed display update is active.	
See also	MD20191 $MC_IGN_PROG_STATE_ASUP: Do not display the execution of the interrupt program on the NC variable	
• More information	Programming Manual SINUMERIK 828D NC programming	

DB3300.DBB4008, index number of the active transformation

Table 10-334 DB3300.DBB4008, index number of the active transformation in the channel

DB3300.DBB4008	Index number of the active transformation in the channel Signals from the NC channel: NC → PLC	
Edge evaluation: No	Signal updated: cyclically	
Signal state 1	Index number of the active transformation in the channel If the transformation is active, the interface signal shows the transformer index of the active transformation. **Example** Program code: N24100 $MC_TRAFO_TYPE_1=24 N24200 $MC_TRAFO_TYPE_2=513 N24300 $MC_TRAFO_TYPE_3=24 Display in the interface signal: TRAORI → E_TransformNo=1 TRAORI(2) → E_TransformNo=3	
See also	Table 10-290 DB3300.DBX1.6, transformation active (Page 294)	

See also

DB330x.DBX0.2, travel forward active (Page 290)

DB330x.DBX4010.0 to .7, status of the enable of the digital NC grinding inputs to the PLC $AC_IN_KEY_G_ISENABLE [1...8]

Table 10-335 DB330x.DBX4010.0 to .7, enable status of the input signals 1 to 8

DB330x.DBX4010.0 to .7	Enable status of the input signals 1 to 8 Signals from NC channel: PLC → NC
Update	cyclic
Signal state 1	The input signal is enabled. The enable signal is formed by the NC-side **AND**logic operation of the NC enable signal $AC_IN_KEY_G_ENABLE[1 to 8] and the PLC enable signal **NOT** (DB320x.DBX18.0 to 7).
Signal state 0	The input signal is not enabled.
Description	Application: Grinding
Corresponds with	DB320x.DBX18.0 to 7 (disabling of the input signals 1 to 8) $AC_IN_KEY_G_ENABLE[1 to 8] (input signal 1 to 8 enable on the NC side) $AC_IN_KEY_G_ISENABLE[1 to 8] (enable status of the input signal 1 to 8)
More information	• Function Manual SINUMERIK 828D synchronized actions

DB330x.DBX4011.0 to .7, status of the function of the digital NC grinding inputs to the PLC $AC_IN_KEY_G_RUN_OUT [1...8]

Table 10-336 DB330x.DBX4011.0 to .7, enabling request of the action 1 to 8

DB330x.DBX4011.0 to .7	**Status of action 1 to 8** **Signals from NC channel: NC → PLC**
Update	cyclic
Signal state 1	It has been requested that the action is enabled.
Signal state 0	It has not been requested that the action is enabled.
Description	Application: Grinding
Corresponds with	DB320x.DBX19.0 to .7 (status of action 1 to 8) $AC_IN_KEY_G_RUN_OUT[1 to 8] (enable request of action 1 to 8 on the NC side) $AC_IN_KEY_G_RUN_IN[1 to 8] (enable of action 1 to 8 on the PLC side)
More information	• Function Manual SINUMERIK 828D synchronized actions

G functions from NCK channel

Table 10-337 DB3500.DBB0 to 63, active G function of groups 1 to 64

DB3500.DBB0 to 63	**Active G function of groups 1 to 64** **Signals from NC channel: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	A G function of the G group is active. The active G group is stored in binary code in the relevant byte, e.g. `G90`: 0 1 0 1 1 0 1 0	
Signal state 0	No G function of the G group is active.	
Special cases, errors, etc.	In contrast to auxiliary functions, G functions are not output to the PLC subject to acknowledgement, i.e. processing of the part program is continued immediately after the G function output.	
More information	• Programming Manual SINUMERIK 828D NC programming	

10.2.6 Axis/spindle-specific signals

Overview

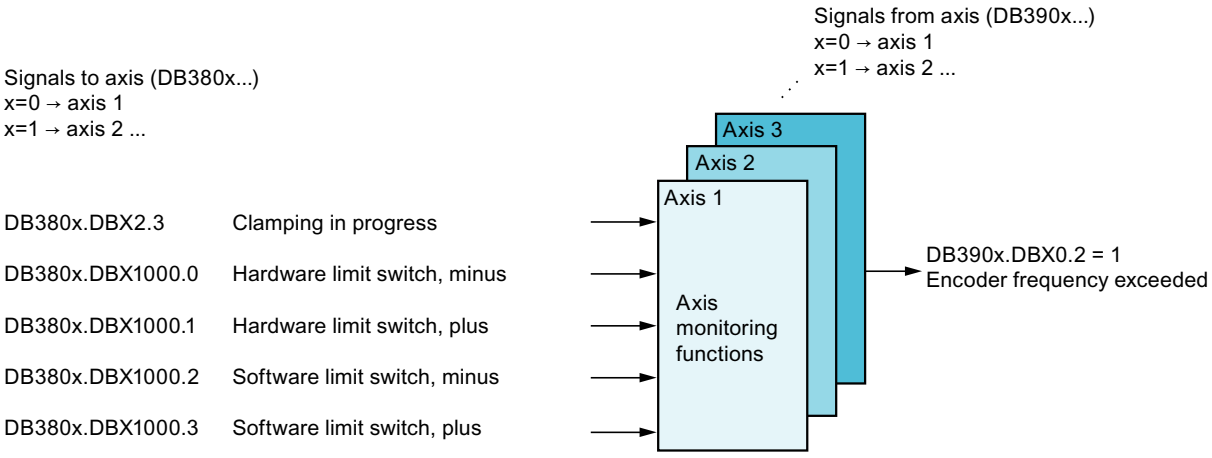


Figure 10-6 Interface signals for axis monitoring functions

10.2.6.1 Transferred axis-specific M, S functions

Table 10-338 DB370x.DBD0, M function for spindle (DINT)

DB370x.DBD0	**M function for spindle (DINT)** **Signals: NC → PLC**	
Edge evaluation:	Signal updated: cyclic	
Application	Generally, the M function is output channel-specifically in the "M functions 1 to 5" signal. In signal "Decoded M signals: M00-M99", the M functions are present for only one PLC cycle. The signals are present in the signal "M functions 1 to 5" until they are output again. Selected M functions for the spindle are available as integer actual value of the PLC in this "M function for the spindle (DINT)" spindle. M3 → value: 3 M4 → value: 4 M5 → value: 5	
See also	Table 10-172 DB2500.DBB1000 to DBB1012, decoded M signals: M0 - M99 (Page 236) Table 10-174 DB2500.DBD3000 to DBD3036, M functions 1 to 5, extended address, M functions 1 to 5 (Page 237) Table 10-339 DB370x.DBD4, S function for spindle (REAL) (Page 314)	
More information	• Function Manual SINUMERIK 828D Axes and Spindles	

Table 10-339 DB370x.DBD4, S function for spindle (REAL)

DB370x.DBD4	**S function for spindle (REAL)** **Signals: NC → PLC**	
Edge evaluation:	Signal updated: cyclic	
Application	Generally, the S function is transferred to the PLC on a channel-for-channel basis in signal "S functions 1 to 3" as a floating-point number. In the "S function for spindle (REAL)" signal, axis-specific S functions are also output as floating-point value to the PLC as follows: S → as spindle speed in r/min (programmed value) S → as constant cutting speed in m/min or ft/min for G96. The following S functions are not output here: S → as progr. spindle speed limitation G25 S → as progr. spindle speed limitation G26 S → as the dwell time in spindle revolutions	
See also	Table 10-172 DB2500.DBB1000 to DBB1012, decoded M signals: M0 - M99 (Page 236) Table 10-174 DB2500.DBD3000 to DBD3036, M functions 1 to 5, extended address, M functions 1 to 5 (Page 237) Table 10-338 DB370x.DBD0, M function for spindle (DINT) (Page 313)	
More information	• Function Manual SINUMERIK 828D Axes and Spindles	

10.2.6.2 Signals from HMI, axis-specific

DB37xx.DBX1000.0, suppress program test

Table 10-340 DB37xx.DBX1000.0, suppress program test

DB37xx.DBX1000.0	**Suppress program test** **Transferred axis-specific M, S functions: HMI → PLC**
Update	cyclic
Signal state 1	Suppression of the program test (setpoint output locked) is requested by the HMI.
Signal state 0	Suppression of the program test (setpoint output locked) is **not** requested by the HMI.
Description	If function "Program test" (PRT) is active in the channel to which the axis currently belongs, the axis is traversed with internal axis disable. Setpoints are generated but they not output to the machine axes. Actual value = Setpoint. If the program test is suppressed for the axis, setpoints are output to the machine axis despite the function "program test" being active in the channel to which the axis currently belongs. **Automatic transfer of the interface signals** The HMI request signals DB250x.DBX5004.0 and .1 are only transferred from the basic PLC program to the PLC request signals DB320x.DBX1002.0 and .1 if FB1 parameter **MMCToIF** is set to **TRUE**. If the parameter is not set, the PLC request signals must be set by the PLC user program.
Corresponds with	DB38xx.DBX1002.0 (suppress program test) DB38xx.DBX1002.1 (activate program test) DB37xx.DBX1000.1 (activate program test)
More information	• Function Manual SINUMERIK 828D basic functions

DB37xx.DBX1000.1, activate program test

Table 10-341 DB37xx.DBX1000.1, activate program test

DB37xx.DBX1000.1	Activate program test Transferred axis-specific M, S functions: HMI → PLC
Update	cyclic
Signal state 1	Activation of the function "program test" (setpoint output locked) is requested by the HMI.
Signal state 0	Activation of the function "program test" (setpoint output locked) is **not** requested by the HMI.
Description	If the function "program test" is active, the axis is traversed with internal axis disable. Setpoints are generated but they not output to the machine axes. Actual value = Setpoint. **Automatic transfer of the interface signals** The HMI request signals DB250x.DBX5004.0 and .1 are only transferred from the basic PLC program to the PLC request signals DB320x.DBX1002.0 and .1 if FB1 parameter **MMCToIF** is set to **TRUE**. If the parameter is not set, the PLC request signals must be set by the PLC user program.
Corresponds with	DB38xx.DBX1002.0 (suppress program test) DB38xx.DBX1002.1 (activate program test) DB37xx.DBX1000.0 (suppress program test)
More information	• Function Manual SINUMERIK 828D basic functions

10.2.6.3 Signals to the axis/spindle

Common signals to axis/spindle

Table 10-342 DB380x.DBB0, feedrate override (axis-specific)

DB380x.DBB0	**Feedrate override (axis-specific)** **Signals to axis/spindle: PLC → NC**		
Edge evaluation: No		Signal updated: cyclic	
Signal state 1	The axis-specific feedrate override is specified via the PLC in Gray code. Gray code for axis-specific feedrate override:		
	Switch setting	Code	Axial feedrate override factor
	1	00001	0.0
	2	00011	0.01
	3	00010	0.02
	4	00110	0.04
	5	00111	0.06
	6	00101	0.08
	7	00100	0.10
	8	01100	0.20
	9	01101	0.30
	10	01111	0.40
	11	01110	0.50
	12	01010	0.60
	13	01011	0.70
	14	01001	0.75
	15	01000	0.80
	16	11000	0.85
	17	11001	0.90
	18	11011	0.95
	19	11010	1.00
	20	11110	1.05
	21	11111	1.10
	22	11101	1.15
	23	11100	1.20
	24	10100	1.20
	25	10101	1.20
	26	10111	1.20
	27	10110	1.20
	28	10010	1.20
	29	10011	1.20
	30	10001	1.20
	31	10000	1.20

DB380x.DBB0	**Feedrate override (axis-specific)** **Signals to axis/spindle: PLC → NC**
See also	Table 10-349 DB380x.DBX1.7, override active (Page 321)
More information	• Function Manual SINUMERIK 828D Axes and Spindles

DB38xx.DBX1.0, drive test travel enable

Table 10-343 DB380x.DBX1.0, drive test travel enable

DB38xx.DBX1.0	**Drive test travel enable** **Signals to axis/spindle: PLC → NC**
Update	cyclic
Signal state 1	The travel enable for the drive test is **set**, i.e. axis motion for the drive test is **enabled**.
Signal state 0	The travel enable for the drive test is **notset**, i.e. axis motion for the drive test is **inhibited**.
More information	The signal is the feedback signal for the request: DB39xx.DBX1.0 == 1 (drive test travel request) Only the PLC can enable an axis so that it can be traversed.
Corresponds with	DB39xx.DBX1.0 (drive test travel request)
More information	• Commissioning Manual SINUMERIK 828D SINUMERIK Operate • Commissioning Manual SINUMERIK 828D Commissioning CNC

Table 10-344 DB380x.DBX1.1, acknowledge fixed stop reached

DB380x.DBX1.1	**Acknowledge fixed stop reached** **Signals to axis/spindle: PLC → NC**	
Edge evaluation: Yes	Signal updated: cyclic	
Edge change 0 → 1	Meaning when the fixed stop is reached: "Fixed stop reached" signal = 1 • The axis presses against the fixed stop with the clamping torque. • The fixed stop monitoring window is activated. • A block change is executed.	
Edge change 1 → 0	The function is aborted, the alarm "20094 axis %1 Function aborted" is output. Meaning when deselecting the "FXS = 0" function via the part program: The torque limiting and the monitoring of the fixed stop monitoring window are canceled.	
Signal relevant for ...	"Fixed stop reached" signal = 1	
See also	The signal is only active if MD37040 $MA_FIXED_STOP_BY_SENSOR = 1	
More information	• Function Manual SINUMERIK 828D Axes and Spindles	

Table 10-345 DB380x.DBX1.2, sensor for fixed stop

DB380x.DBX1.2	**Sensor for fixed stop** **Signals to axis/spindle: PLC → NC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	Fixed stop has been reached.	

DB380x.DBX1.2	**Sensor for fixed stop** **Signals to axis/spindle: PLC → NC**
Signal state 0	Fixed stop has not been reached.
See also	The signal is only active if MD37040 $MA_FIXED_STOP_BY_SENSOR = 1
More information	• Function Manual SINUMERIK 828D Axes and Spindles

Table 10-346 DB380x.DBX1.3, axis/spindle disable

DB380x.DBX1.3	**Axis/spindle disable** **Signals to axis/spindle: PLC → NC**
Edge evaluation: No	Signal updated: cyclic
Signal state 1	Axis disable: If the "Axis disable" interface signal is present, no more setpoints are output to the position controller for this axis. The traversing motion of the axis is therefore disabled. The position control loop remains closed and the remaining following error is reduced to zero. A moving axis is stopped with a ramp stop. If an axis with axis disable is traversed, the actual position value display shows the position setpoint, and the actual velocity value display shows the velocity setpoint even though the machine axis is not actually traversing. With reset, the actual position value display is set to the real actual value of the machine. Travel commands continue to be output to the PLC for this axis. If the signal is canceled again, the associated axis can again traverse normally. Spindle disable: If the "Spindle disable" signal is issued, then no more setpoints are output to the speed controller in the open-loop control mode or to the position controller in positioning mode for this spindle. The motion of the spindle is thus disabled. For a rotating spindle, the spindle is stopped corresponding to its acceleration characteristic. The actual speed value display shows the speed setpoint. The spindle disable can only be canceled via "Reset" or M2 followed by a program restart.
Signal state 0	The position setpoints are transferred cyclically to the position controller. The speed setpoints are transferred cyclically to the speed controller. Cancellation of the "Axis/spindle disable" does not take effect until the axis/spindle is stationary, i.e. an interpolation setpoint is no longer present.
Application	The "Axis/spindle disable" signal is used when running-in and testing a new NC part program. In so doing, the machine axes and spindles should not execute any traversing or rotational motion.
Special cases, errors, etc.	If the "Axis/spindle disable" signal is present, the following signals have no effect with regard to the braking of the axis/spindle: • "Controller enable" signal • "Feed/spindle stop" and, if required, • "Hardware limit switches plus and minus" signal • "Follow-up mode" signal if the axis/spindle is brought into the "Hold" or "Follow-up" state

DB380x.DBX1.3	Axis/spindle disable Signals to axis/spindle: PLC → NC
See also	Table 10-291 DB3300.DBX1.7, program test active (Page 294) Table 10-347 DB380x.DBX1.4, follow-up mode (Page 319) Table 10-358 DB380x.DBX4.3, feed stop / spindle stop (axis-specific) (Page 328) Table 10-364 DB380x.DBX1000.1 and .0, hardware limit switches plus and minus (Page 332) Table 10-347 DB380x.DBX1.4, follow-up mode (Page 319)
More information	• Function Manual SINUMERIK 828D basic functions • Function Manual SINUMERIK 828D Axes and Spindles

Table 10-347 DB380x.DBX1.4, follow-up mode

DB380x.DBX1.4	Follow-up mode Signals to axis/spindle: PLC → NC
Edge evaluation: No	Signal updated: cyclic
Signal state 1	Follow-up mode is selected for the axis/spindle by the PLC. The means that the position setpoint continually tracks the actual value if the controller enable for the drive is withdrawn. As soon as the follow-up mode is effective, the "Follow-up mode active" signal is set. The actual value continues to be acquired and updated. If the axis/spindle is moved from its current position by an external effect, the standstill and clamping monitoring do not issue an alarm. When the control is reactivated, a control-internal repositioning operation is performed (REPOSA: Linear approach with all axes) to the last programmed position if a part program is active.
Signal state 0	Follow-up mode is not selected (so-called hold). When the "Controller enable" signal is removed, the previous position setpoint is retained in the control. If the axis/spindle is pushed out of position during this time, a following error occurs between the position setpoint and the actual position value. This position difference is reduced to zero immediately by issuing the "Controller enable" so that the previous position setpoint is restored. Then, all the other axis motions start from the position setpoint valid before the "Controller enable" was removed. When the position control is switched on again, the axis may make a speed setpoint jump. Standstill monitoring or clamping monitoring is still active. To switch off the standstill monitoring, the "Clamping operation running" signal should be set when clamping an axis. In the "Hold" state, the "Follow-up mode active" signal is set to "0".
Special cases, errors, etc.	If the drive controller enable is cancelled in the control due to faults, the following should be observed: After the queued alarms have been successfully deleted, i.e. the controller enable is issued again in the control, then "Hold" should be activated before an NC start. Otherwise, for an NC start and selected follow-up mode, the traversing distance of the previous NC block would not be executed because of the internal delete distance-to-go. Note: During the transition from the "Follow-up" state to the "Hold" state or when the controller enable is set in position control, delete distance-to-go is activated in the control. As a consequence, for example, an NC block, in which only this axis is traversed, is terminated directly.
See also	Table 10-350 DB380x.DBX2.1, controller enable (Page 322) Table 10-352 DB380x.DBX2.3, clamping in progress (Page 325) Table 10-412 DB390x.DBX1.3, follow-up active (Page 357)
More information	• Function Manual SINUMERIK 828D Axes and Spindles

Table 10-348 DB380x.DBX1.5 and .6, position measuring system 1 (PMS1) / position measuring system 2 (PMS2)

DB380x.DBX1.5/.6	**Position measuring system 1 (PMS1) / Position measuring system 2 (PMS2)** **Signals to axis/spindle: PLC → NC**		
Edge evaluation: No	Signal updated: cyclic		
Signal state 1	The position measuring system is enabled.		
Signal state 0	The position measuring system is disabled.		
Signal state overview	PMS1	PMS2	Effect
	1	0	Position measuring system 1 is active: • Position measuring system 1 is used for position control. • If position measuring system 2 is also available, its actual position value is also acquired, MD30200 $MA_NUM_ENCS == 2.
	0	1	Position measuring system 2 is active: • Position measuring system 2 is used for position control. • If position measuring system 1 is also available, its actual position value is also acquired, MD30200 $MA_NUM_ENCS == 2.
	1	1	• Position measuring system 1 is used for position control. • If position measuring system 2 is also available, its actual position value is also acquired, MD30200 $MA_NUM_ENCS == 2.
	0	0	Position measuring systems 1 and 2 are inactive: • There is no actual value acquisition. • The monitoring of the position measuring systems has been deactivated. • As soon as an axis is in parking, the following interface signals are reset: – "Position controller active" signal – "Speed controller active" signal – "Current controller active" signal – "Referenced/synchronized 1/2" signal After parking has been completed, the axis must be referenced again.
	Notes • If the signal of the active position measuring system is reset for a traversing axis, the axis is stopped with a ramp stop without the controller enable being canceled internally. • If a speed-controlled spindle does not have a position measuring system, the "Controller enable" = 1 signal must be set.		

DB380x.DBX1.5/.6	Position measuring system 1 (PMS1) / Position measuring system 2 (PMS2) Signals to axis/spindle: PLC → NC
Application	1. Switching over from position measuring system 1 to position measuring system 2 and vice versa: If the axis was referenced in both position measuring systems and in the meantime, the limit frequency of the measuring encoder used was not exceeded, i.e. "Referenced/synchronized 1/2" signal = 1, then after the switchover, a new reference point approach is not required. At the switchover. the current difference between position measuring systems 1 and 2 is traversed immediately. Using MD36500 $MA_ENC_CHANGE_TOLL, a tolerance bandwidth can be specified in which the deviation between the two actual values is permitted at the switchover. If the actual value difference is greater than the tolerance, a switchover between the two systems does not take place and alarm 25100 "Measuring system switchover not possible" is triggered. 2. Parking axis, i.e. no PMS is active: To remove the sensor, the monitoring of the position measuring system is switched off in the parking position, e.g. if a rotary table is to be removed from the machine. In some cases, the sensor mounted on the axis/spindle turns so fast that its specified electrical properties (rate of change, etc.) can no longer be maintained. 3. Switching-off the measuring system: When the measuring system is switched-off, the associated "Referenced/synchronized 1/2" signal is reset. 4. Reference point approach: The reference point approach of the axis is executed with the selected position measuring system.
Special cases, errors, etc.	If the "Parking axis" state is active, then the "Referenced/synchronized 1/2" signal is ignored at NC start for this axis.
See also	Table 10-350 DB380x.DBX2.1, controller enable (Page 322) Table 10-406 DB390x.DBX0.5, referenced/synchronized 2 (Page 354) Table 10-414 DB390x.DBX1.5, position controller active (Page 358) Table 10-415 DB390x.DBX1.6, speed controller active (Page 358) Table 10-416 DB390x.DBX1.7, current controller active (Page 359) Table 10-347 DB380x.DBX1.4, follow-up mode (Page 319) MD36500 $MA_ENC_CHANGE_TOL: Maximum tolerance for actual position value switchover MD30200 $MA_NUM_ENCS: Number of encoders
More information	• Function Manual SINUMERIK 828D Axes and Spindles

Table 10-349 DB380x.DBX1.7, override active

DB380x.DBX1.7	Override active Signals to axis/spindle: PLC → NC	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	Feedrate override active (for axes): The axis-specific feedrate override between 0 and a maximum of 120% entered in the PLC interface is used. Spindle override active (for spindle): The spindle override between 50% and a maximum of 120% entered in the PLC interface is used.	

DB380x.DBX1.7	**Override active** **Signals to axis/spindle: PLC → NC**
Signal state 0	The existing axis-specific feedrate override or spindle override is not active. If the override is inactive, "100%" is used as the internal override factor. Note: The 1st switch position of the gray-coded interface for the value is an exception. For "Override inactive", the override factor of the 1st switch position is also used and for axes, 0% is output as override value (acts the same as "Feedrate disable"); correspondingly 50% for the spindle.
Application	The override value is generally specified using the axis-specific feedrate override switch or the spindle override switch on the machine control panel. The "Feedrate override active" signal can be used to enable the override switches from the PLC user program, e.g. using the key-operated switch, when commissioning a new NC program.
Special cases, errors, etc.	The spindle override is always accepted with 100% in the spindle "Oscillation mode". The spindle override acts on the programmed values before limits (e.g. `G26`) intervene. The feedrate override or spindle override is inactive when `G33` is active.
See also	Table 10-342 DB380x.DBB0, feedrate override (axis-specific) (Page 316) Table 10-382 DB380x.DBB2003, spindle override (Page 342)
More information	• Function Manual SINUMERIK 828D Axes and Spindles

Table 10-350 DB380x.DBX2.1, controller enable

DB380x.DBX2.1	**Controller enable** **Signals to axis/spindle: PLC → NC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The position control loop of the axis/spindle is closed; the axis/spindle is in closed-loop control. When "Controller enable" is set by the PLC user program: • The position control loop of the axis is closed. • The actual position value is no longer switched to the position setpoint. • The controller enable of the drive is set. • The "Position controller active" signal is set to 1. When "Controller enable" has been issued, no new actual value synchronization of the axis (reference point approach) is required if the maximum permissible limit frequency of the axis measuring system has not been exceeded during follow-up mode. Depending on the "Follow-up mode" signal, it is possible to select whether or not the axis traverses to the earlier setpoint position first (i.e. the positional deviation caused by the clamping process is traversed).	

DB380x.DBX2.1	Controller enable Signals to axis/spindle: PLC → NC
Signal state 0	The "Controller enable" signal is removed. The following interface signals are set to "0": • "Position controller active" signal • "Speed controller active" signal • "Current controller active" signal The procedure for removing "Controller enable" depends on whether the axis/spindle or an axis of the geometry grouping is stationary or traversing at this point in time: • Axis/spindle stationary: – Position control loop of axis is opened. – When the "Follow-up mode" signal = 1, the actual position value is switched to the position setpoint (i.e. the position setpoint is corrected to the actual position value). The actual position value of the axis/spindle continues to be acquired by the control. – The controller enable of the drive is removed. • Axis/spindle traverses: – The axis is stopped with a rapid stop. – Alarm 21612 "VDI signal controller enable reset during motion" is signaled. – The position control loop of the axis/spindle is opened. – Independent of the "Follow-up mode" signal, at the end of braking, the actual position value is switched to the position setpoint (i.e. the position setpoint is corrected to the actual position value). – Independent of the "Follow-up mode" signal, at the end of braking the actual position value is switched to the position setpoint (i.e. the position setpoint is corrected to the actual position value). The actual position value of the axis/spindle continues to be acquired by the control. The "Follow-up mode" signal is set. The axis state cannot be changed again until after the reset.
Application	Using the controller enable when clamping the axis: The axis is positioned at the clamping position. As soon as it has stopped, it is clamped and then the "Controller enable" is removed. It is removed because the axis could be mechanically forced out of position slightly by clamping, and the position controller would continuously have to work against the clamping. When clamping is to be canceled, a controller enable signal is first set again and then the axis is removed from clamping.
Special cases, errors, etc.	If an attempt is made to traverse an axis without "Controller enable", the axis remains stationary, but sends a travel command to the PLC. The travel command is retained and executed when the "Controller enable" is present again. If the "Controller enable" of a traversing geometry axis is removed, the programmed contour cannot be maintained. "Controller enable" is automatically cancelled by the control when certain faults occur at the machine, at the position measuring system or at the control.
See also	Table 10-414 DB390x.DBX1.5, position controller active (Page 358) Table 10-415 DB390x.DBX1.6, speed controller active (Page 358) Table 10-416 DB390x.DBX1.7, current controller active (Page 359) Table 10-347 DB380x.DBX1.4, follow-up mode (Page 319) MD36620 $MA_SERVO_DISABLE_DELAY_TIME: Controller enable shutdown delay MD36610 $MA_AX_EMERGENCY_STOP_TIME: Duration of the braking ramp for error states
More information	• Function Manual SINUMERIK 828D Axes and Spindles

DB38xx.DBX2.2, spindle reset/delete distance-to-go

Table 10-351 DB38xx.DBX2.2, spindle reset/delete distance-to-go

DB38xx.DBX2.2	**Delete distance-to-go/spindle reset** **Signals to axis/spindle: PLC → NC**
Update	cyclic
Edge change 0 → 1	**Axis**: "Delete-distance-to-go" is requested. **Spindle**: Reset is requested
Edge change 1 → 0	No effect.
Description	**Axis: Delete distance-to-go** • AUTOMATIC and MDI modes The interface signal is only active if the axis is traversed as positioning axis. A positioning axis is decelerated to standstill along its brake characteristic. The distance-to-go of the axis is deleted. • JOG mode The axis is braked down to standstill alone its deceleration characteristic and then a possible delete distance to go is a deleted. **Note** After the delete distance to go, in an NC program, the following block is prepared again with the actual axis position. As a consequence, a different contour is traversed along than programmed in the NC program. Traversing to absolute position G90 in the block after "Delete distance-to-go" at least allows the programmed position is approached. When traversing using incremental dimension G91, then the programmed position would not be approached.
	Spindle: Reset • Control mode: – The spindle is stopped – The NC program is again executed – The spindle continues to rotate with the next M and S value programmed in the NC program. • Oscillation mode: – Oscillation is interrupted – The axes continue to traverse – The NC program continues with the actual gear stage – The spindle continues to rotate with the next M and S value programmed in the NC program. The speed obtained from these values (actual S value and the last active gear stage) could be too high. In this case, the interface signal is set. DB39xx.DBX2001.1 • Positioning mode: The spindle is stopped • Axis mode: The spindle is stopped **Note** The response for a spindle reset is independent of the setting in machine data: MD35040 $MA_SPIND_ACTIVE_AFTER_RESET
	Dwell time (G4): Delete distance-to-go During a block with dwell time (G4), the interface signal has **no** influence on the time that elapses.

DB38xx.DBX2.2	**Delete distance-to-go/spindle reset** **Signals to axis/spindle: PLC → NC**
Corresponds with	DB32xx.DBX6.2 (delete distance-to-go) DB39xx.DBX2001.1 (programmed speed too high) MD35040 $MA_SPIND_ACTIVE_AFTER_RESET (own spindle reset)
More information	• Function Manual SINUMERIK 828D Axes and Spindles

Table 10-352 DB380x.DBX2.3, clamping in progress

DB380x.DBX2.3	**Clamping in progress** **Signals to axis/spindle: PLC → NC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	Clamping in progress. The clamping monitoring is activated.	
Signal state 0	Clamping completed. The clamping monitoring is replaced by the standstill monitoring.	
See also	MD36050 $MA_CLAMP_POS_TOL: Clamping tolerance	
More information	• Function Manual SINUMERIK 828D monitoring and compensating	

Table 10-353 DB380x.DBX2.4 to .7, reference point values 1 to 4

DB380x.DBX2.4 to .7	**Reference point values 1 to 4** **Signals to axis/spindle: PLC → NC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	When the reference cam is reached, the NC is signaled which coded reference cam has been approached. The signal must remain set until the reference point is reached or until a new coded reference cam is approached. If the machine axis has reached the reference point (axis stationary), then the reference point value, preselected via the signal from MD34100, is accepted as the new reference position in the control.	
Signal state 0	No effect.	
Application	On a machine tool with large traversing distances, four coded reference cams can be distributed over the entire distance traveled by the axis, four different reference points approached and the time required to reach a valid referenced point reduced.	
Special cases, errors, etc.	If the machine axis has reached the reference point and none of the four signals is set, then reference point value 1 is automatically valid.	
Signal irrelevant for ...	Length measurement systems with distance-coded reference marks.	
See also	MD34100 $MA_ REFP_SET_POS: Reference point value MD36050 $MA_CLAMP_POS_TOL: Clamping tolerance	
More information	• Function Manual SINUMERIK 828D Axes and Spindles	

Table 10-354 DB380x.DBX3.1, enable travel to fixed stop

DB380x.DBX3.1	**Enable travel to fixed stop** **Signals to axis/spindle: PLC → NC**	
Edge evaluation: Yes	Signal updated: cyclic	
Edge change 0 → 1	Meaning when selecting the `FXS` function via the part program: "Activate travel to fixed stop" signal = 1. Travel to fixed stop is enabled and the axis traverses from the start position at the programmed velocity to the programmed target position.	

DB380x.DBX3.1	**Enable travel to fixed stop** **Signals to axis/spindle: PLC → NC**
Edge change 1 → 0	Meaning before the fixed stop has been reached, "Fixed stop reached" signal = 0. • Travel to fixed stop is aborted • Alarm "20094: Axis%1 function was aborted" is displayed Meaning after the fixed stop has been reached, "Fixed stop reached" signal = 1. • The torque limiting and monitoring of the fixed stop monitoring window are canceled.
Signal irrelevant for ...	MD37060 = 0 or 2
See also	MD37060 $MA_FIXED_STOP_ACKN_MASK: Monitoring of PLC acknowledgements for travel to fixed stop Table 10-420 DB390x.DBX2.4, activate travel to fixed stop (Page 360)
More information	• Function Manual SINUMERIK 828D Axes and Spindles

DB38xx.DBX3.2 to .5, activate fixed feedrate 1 to 4

Table 10-355 DB380x.DBX3.2 to .5, activate fixed feedrate 1 to 4, machine axes

<table>
<tr><td>DB38xx.DBX3.2 to .5</td><td colspan="5">Activate fixed feedrate 1 to 4, machine axes
Signals to axis/spindle: PLC → NC</td></tr>
<tr><td>Update</td><td colspan="5">cyclic</td></tr>
<tr><td>Description</td><td colspan="5">With the interface signals, in the JOG mode, the fixed feedrate - parameterized using machine data - is activated.</td></tr>
<tr><td></td><td>Bit 5</td><td>Bit 4</td><td>Bit 3</td><td>Bit 2</td><td>Meaning</td></tr>
<tr><td></td><td>0</td><td>0</td><td>0</td><td>0</td><td>Fixed feedrate not selected</td></tr>
<tr><td></td><td>0</td><td>0</td><td>0</td><td>1</td><td>Fixed feedrate 1</td></tr>
<tr><td></td><td>0</td><td>0</td><td>1</td><td>0</td><td>Fixed feedrate 2</td></tr>
<tr><td></td><td>0</td><td>1</td><td>0</td><td>0</td><td>Fixed feedrate 3</td></tr>
<tr><td></td><td>1</td><td>0</td><td>0</td><td>0</td><td>Fixed feedrate 4</td></tr>
<tr><td></td><td colspan="5">Instead of the parameterized JOG velocity/ JOG rapid traverse velocity (MD... ...JOG_VELO_...), the axis is traversed with the selected fixed feedrate. The traversing direction is specified via the interface signal:
DB38xx.DBX4.6 and .7 (traversing keys minus/plus)</td></tr>
<tr><td></td><td colspan="5">The fixed feedrates are parameterized using the following machine data:
• Linear axes: MD12202 $MN_PERMANENT_FEED
• Rotary axes: MD12204 $MN_PERMANENT_ROT_AX_FEED
• Spindles: MD12205 $MN_PERMANENT_SPINDLE_FEED</td></tr>
<tr><td></td><td colspan="5">Notes
• The fixed feedrate is not used for:
– Positioning axes
– Tapping
• The fixed feedrate for linear and rotary axes is always interpreted as linear feedrate.</td></tr>
</table>

DB38xx.DBX3.2 to .5	Activate fixed feedrate 1 to 4, machine axes Signals to axis/spindle: PLC → NC
Corresponds with	MD12200 $MN_RUN_OVERRIDE_0 (traversing behavior with override 0) MD12202 $MN_PERMANENT_FEED (fixed feedrates for linear axes) MD12204 $MN_PERMANENT_ROT_AX_FEED (fixed feedrates for rotary axes) MD12205 $MN_PERMANENT_SPINDLE_FEED (fixed feedrates for spindles) MD21150 $MC_JOG_VELO_RAPID_ORI (conventional rapid traverse for orientation axes) MD21155 $MC_JOG_VELO_ORI (conventional velocity for orientation axes) MD21160 $MC_JOG_VELO_RAPID_GEO (conventional rapid traverse for geometry axes) MD21165 $MC_JOG_VELO_GEO (conventional velocity for geometry axes) MD32010 $MA_JOG_VELO_RAPID (conventional rapid traverse) MD32020 $MA_JOG_VELO (conventional axis velocity)
More information	• Function Manual SINUMERIK 828D Axes and Spindles

Table 10-356 DB380x.DBX3.6, velocity / spindle speed limitation

DB380x.DBX3.6	Velocity/spindle speed limitation Signals to axis/spindle: PLC → NC	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The NC limits the velocity / spindle speed to the limit value set in MD35160 $MA_SPIND_EXTERN_VELO_LIMIT.	
Signal state 0	No limitation active.	
Signal irrelevant for ...	Length measurement systems with distance-coded reference marks.	
See also	MD35100:SPIND_VELO_LIMIT: Maximum spindle speed SD43220 SPIND_MAX_VELO_G26: Prog. spindle speed limitation G26 SD43230 SPIND_MAX_VELO_LIMIT: Spindle speed limitation G96	
More information	• Function Manual SINUMERIK 828D monitoring and compensating	

Table 10-357 DB380x.DBX4.0 to .2, activate handwheel 1/2/3

DB380x.DBX4.0 to .2	Activate handwheel 1/2/3 Signals to axis/spindle: PLC → NC	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	These signals determine whether this machine axis is assigned to handwheel 1/2/3 or no handwheel. Only one handwheel can be assigned to an axis at any one time. If several "Activate handwheel" signals are set, then the following priority applies: Handwheel 1 before Handwheel 2 before Handwheel 3. If the assignment is active, then the machine axis can be traversed using the handwheel in JOG mode.	
Signal state 0	Neither handwheel 1, 2 nor 3 is assigned to this machine axis.	
Application	The PLC user program can use this signal to interlock the control on the axis when turning a handwheel.	
See also	Table 10-426 DB390x.DBX4.0 to .2, handwheel 1/2/3 active (Page 362)	
More information	• Function Manual SINUMERIK 828D Axes and Spindles	

Table 10-358 DB380x.DBX4.3, feed stop / spindle stop (axis-specific)

DB380x.DBX4.3	**Feed stop / spindle stop (axis-specific)** **Signals to axis/spindle: PLC → NC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The signal is active in all modes. Feed stop: • The signal triggers a feed stop for the relevant axis. This signal brings all traversing axes to a standstill with controlled braking (ramp stop). No alarm is output. • The signal triggers a feed stop for all path axes interpolating relative to each other when the "Feed stop" is activated for any one of these path axes. In this case, all the axes are brought to a stop with adherence to the path contour. When the feed stop signal is removed, execution of the interrupted part program is resumed. • The position control is retained, i.e. the following error is eliminated. • If a travel request is issued for an axis with an active "Feed stop", this is retained. This queued travel request is executed immediately after the "Feed stop" is canceled. If the axis is interpolating in relation to others, this also applies to these axes. Spindle stop: • The spindle is brought to a standstill along the acceleration characteristic. • In positioning mode, positioning is interrupted when the "Spindle stop" signal is set. The above response applies with respect to individual axes.	
Signal state 0	Feed stop: • The feed is enabled for the axis. • If a travel request ("Travel command") is active when the "Feed stop" is canceled, this is executed immediately. Spindle stop: • The speed is enabled for the spindle. • When "Spindle stop" is canceled, the spindle is accelerated to the previous speed setpoint with the acceleration characteristic or, in positioning mode, positioning is resumed.	
Application	Feed stop: The traversing motion of the machine axes is not started with "Feed stop", if, for example, certain operating states exist at the machine that do not permit the axes to be moved, e.g. a door is not closed. Spindle stop: In order to change a tool.	
More information	• Function Manual SINUMERIK 828D Axes and Spindles	

Table 10-359 DB380x.DBX4.4, traversing key disable

DB380x.DBX4.4	**Traversing key disable** **Signals to axis/spindle: PLC → NC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The plus and minus traversing keys have no effect on the relevant machine axes. It is therefore not possible, for example, to traverse the axis in JOG mode with the traversing keys on the MCP. If the traversing key disable is activated during a traversing motion, the machine axis is stopped.	
Signal state 0	The plus and minus traversing keys are enabled.	
Signal irrelevant for ...	Length measurement systems with distance-coded reference marks.	

DB380x.DBX4.4	**Traversing key disable** **Signals to axis/spindle: PLC → NC**
Application	It is thus possible, depending on the operating mode, to disable manual traversing of the machine axis in JOG mode with the traversing keys from the PLC user program.
See also	Table 10-361 DB380x.DBX4.7 and .6, plus and minus traversing keys for axes in the WCS (Page 330)
More information	• Function Manual SINUMERIK 828D Axes and Spindles

Table 10-360 DB380x.DBX4.5, rapid traverse override

DB380x.DBX4.5	**Rapid traverse override** **Signals to axis/spindle: PLC → NC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	If the "Rapid traverse override" signal is issued together with the "Traversing key plus" or "Traversing key minus", then the relevant machine axis moves with rapid traverse. Machine data MD32010 defines the rapid traverse velocity. The rapid traverse override is effective in JOG mode for the following versions: • Continuous jogging • Incremental jogging If rapid traverse override is active, the velocity can be modified with the rapid traverse override switch.	
Signal state 0	The machine axis traverses with the specified JOG velocity from SD41110 or SD41130 or MD32020.	
Signal irrelevant for ...	• AUTOMATIC and MDI modes • Reference point approach (JOG mode)	
See also	Table 10-361 DB380x.DBX4.7 and .6, plus and minus traversing keys for axes in the WCS (Page 330) MD32010 $MA_JOG_VELO_RAPID: Rapid traverse in jog mode SD41110 $SN_JOG_SET_VELO: Axis velocity for JOG SD41130 $SN_JOG_ROT_AX_SET_VELO: Axis velocity of the rotary axes in JOG mode or MD32020 $MA_JOG_VELO: Conventional axis velocity	
More information	• Function Manual SINUMERIK 828D Axes and Spindles	

Table 10-361 DB380x.DBX4.7 and .6, plus and minus traversing keys for axes in the WCS

DB380x.DBX4.7/.6	**Plus and minus traversing keys for axis 1 in the WCS** **Plus and minus traversing keys for axis 2 in the WCS** **Plus and minus traversing keys for axis 3 in the WCS** **Signals to axis/spindle: PLC → NC**
Edge evaluation: Yes	Signal updated: cyclic
Edge change 0 → 1	The selected axis can be traversed in both directions in JOG mode using the plus and minus traversing keys. Incremental travel: With signal state 1, the axis starts to traverse the set increment. If the signal changes to the 0 state before the increment is traversed, the traversing is interrupted. When the signal state changes to 1 again, the traversing is continued. The axis can be stopped and started several times as described above until it has traversed the complete increment. Continuous travel: If an INC dimension has not been selected, but instead "Continuous", then the axis traverses as long as the traversing key is kept pressed. If both traversing signals (plus and minus) are set at the same time, no traversing occurs, or traversing is aborted! The effect of the traversing keys can be disabled for every axis individually with the "Traversing key disable" signal.
Edge change 1 → 0	No traversing.
Signal irrelevant for ...	AUTOMATIC and MDI modes.
Special cases, errors, etc.	The geometry axis cannot be traversed in JOG mode: • If it is already being traversed via the axis-specific PLC interface (as a machine axis). • If another geometry axis is already being traversed with the traversing keys. Alarm 20062 "Axis already active" is output.
See also	Table 10-270 DB3200.DBX1000.0 to .2, 1004.0 to .2, 1008.0 to .2, activate handwheel 1/2/3 for axes in the WCS (Page 283) Table 10-359 DB380x.DBX4.4, traversing key disable (Page 328)
More information	• Function Manual SINUMERIK 828D Axes and Spindles

Table 10-362 DB380x.DBX5.0 to .6, machine functions INC1 ... INCvar

DB380x.DBX5.0 to .6	**Machine functions INC1, INC10, INC100, INC1000, INC10000, INCvar, continuous** **Signals to mode: PLC → NC**
Edge evaluation: No	Signal updated: cyclic
Signal state 1	This input range is only used if the "INC inputs active in the mode group area" signal is not set. The "INC inputs active in the mode area" signal specifies how many increments the axis traverses when the traversing key is pressed or the handwheel is turned one detent position. In this case, JOG mode must be active. The SD41010 value generally applies for the "INCvar" signal. With "Continuous", the associated axis can be traversed with the plus or minus traversing key as long as the key is pressed. As soon as the selected machine function becomes active, this is signaled to the "Active machine function INC1; ..." signal. If several signals "INC1, INC..." or "Continuous travel", are selected at the interface simultaneously, no machine function is activated by the control. Note: The "INC..." or "Continuous" input signal to change an active machine function must be present for at least one PLC cycle. A steady-state signal is not required.

DB380x.DBX5.0 to .6	**Machine functions INC1, INC10, INC100, INC1000, INC10000, INCvar, continuous** **Signals to mode: PLC → NC**
Signal state 0	The relevant machine function is not selected. No request is made to change an active machine function. If an axis is currently traversing an increment, this movement is also aborted if this machine function is deselected or switched over.
See also	Table 10-181 DB2600.DBX1.0, INC inputs in the mode signal range active (Page 241) Table 10-270 DB3200.DBX1000.0 to .2, 1004.0 to .2, 1008.0 to .2, activate handwheel 1/2/3 for axes in the WCS (Page 283) Table 10-273 DB3200.DBX1000.5, 1004.5, 1008.5, rapid traverse override for axes in the WCS (Page 285) Table 10-319 DB3300.DBX1001.0 to .6, 1005.0 to .6, 1009.0 to .6, machine functions INC1 ... continuous for axes in the WCS (Page 305) Table 10-429 DB390x.DBX5.0 to .6, machine functions INC1 ... continuous (Page 364) Table 10-275 DB3200.DBX1001.0 to .6, 1005.0 to .6, 1009.0 to .6, machine functions INC1 to INCvar (Page 287) SD $SN_SD41010_$SC_JOG_VAR_INCR_SIZE: Size of the variable increment for JOG.
More information	• Function Manual SINUMERIK 828D Axes and Spindles

Table 10-363 DB380x.DBB8, axis/spindle replacement

DB380x.DBB8	**Axis/spindle replacement** **Signals to operating mode: PLC → NC**	
Edge evaluation: Yes	Signal updated: cyclic	
Signal state 1	The current axis type and currently active channel for this axis must be specified. With axis replacement by the PLC, the bit meanings of the signal to axis/spindle DB3800.DBB8:	
	Bit 0:	A → Assign NC axis/spindle channel
	Bit 1:	B → Assign NC axis/spindle channel
	Bit 2:	-
	Bit 3:	-
	Bit 4:	Activation, assignment by means of a positive edge
	Bit 5:	-
	Bit 6:	-
	Bit 7:	Request PLC axis/spindle
Signal state 0		
See also	Table 10-431 DB390x.DBB8, axis/spindle replacement (Page 365) MD20070_$MC_AXCONF_MACHAX_USED: Machine axis number valid in channel MD30550_$MA_AXCONF_ASSIGN_MASTER_CHAN: Reset position of channel for axis change	
More information	• Function Manual SINUMERIK 828D basic functions	

Signals to axis

Table 10-364 DB380x.DBX1000.1 and .0, hardware limit switches plus and minus

DB380x.DBX1000.1 **DB380x.DBX1000.0**	**Hardware limit switches plus and minus** **Signals to axis/spindle: PLC → NC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	A switch can be mounted at each end of the travel range of a machine axis which will cause a "Hardware limit switch plus or minus" signal to be signaled to the NC via the PLC if it is actuated. If the signal is recognized as set, alarm 021614 "Hardware limit switch plus or minus" is output and the axis is immediately braked. The way is defined with MD36600.	
Signal state 0	Normal condition - a hardware limit switch has not been actuated.	
See also	MD36600 $MA_BRAKE_MODE_CHOICE: Braking behavior for hardware limit switch	
More information	• Function Manual SINUMERIK 828D monitoring and compensating	

Table 10-365 DB380x.DBX1000.3 and .2, 2nd software limit switch plus/minus

DB380x.DBX1000.3 **DB380x.DBX1000.2**	**2nd software limit switch plus/minus** **Signals to axis/spindle: PLC → NC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	2nd software limit switch is active for the plus or minus direction. 1st software limit switch is not active for the plus or minus direction. In addition to the 1st software limit switches (plus and minus), further software limit switches can be activated via the "2nd software limit switch plus/minus" signal. The position is defined by MD36130 and MD36120.	
Signal state 0	1st software limit switch is active for the plus or minus direction. 2nd software limit switch is not active for the plus or minus direction.	
See also	MD36130 $MA_POS_LIMIT_PLUS2: 2nd software limit switch plus. MD36120 $MA_POS_LIMIT_MINUS2: 2nd software limit switch minus.	
More information	• Function Manual SINUMERIK 828D monitoring and compensating	

DB38xxDBX1000.4, modulo limit enabled

Table 10-366 DB38xxDBX1000.4, modulo rotary axis: activate traversing range limits

DB38xxDBX1000.4	**Modulo rotary axis: activate traversing range limits** **Signals to axis/spindle: PLC → NC**
Update	cyclic
Signal state 1	Activate traversing range limits (software limit switch, working area limits) for modulo rotary axes.
Signal state 0	Deactivate traversing range limits for modulo rotary axes.
Description	**Note** The signal is irrelevant if linear axes/rotary axes do not have modulo functionality. **Application example** Mounted rotary axis with monitoring

DB38xxDBX1000.4	**Modulo rotary axis: activate traversing range limits** **Signals to axis/spindle: PLC → NC**
Corresponds with	DB39xx.DBB1000.4 (modulo rotary axis: traversing range limits active)
More information	• Function Manual SINUMERIK 828D Axes and Spindles

Table 10-367 DB380x.DBX1000.7, deceleration of reference point approach

DB380x.DBX1000.7	**Deceleration of reference point approach** **Signals to axis/spindle: PLC → NC**
Edge evaluation: No	Signal updated: cyclic
Signal state 1	The machine axis is positioned at the reference cam.
Signal state 0	The machine axis is positioned in front of the reference cam. An appropriately long reference cam (up to the end of the traversing range) should be used to prevent the machine axis from being located beyond the referencing cam.
More information	• Function Manual SINUMERIK 828D Axes and Spindles

DB38xx.DBX1001.0 to .2, activate fixed-point approach in JOG

Table 10-368 DB38xx.DBX1001.0 to .2, JOG fixed-point approach

DB38xx.DBX1001.0 to .2	**JOG fixed point approach** **Signals to axis/spindle: PLC → NC**
Update	cyclic
Description	After selecting the "Approach fixed point in JOG" function, the PLC outputs the number of the fixed point to be approached binary coded to the NC in DB38xx.DBX.0 to .2:

Bit 2	**Bit 1**	**Bit 0**	**Number of fixed point to be approached**
0	0	0	-
0	0	1	1
0	1	0	2
0	1	1	3
1	0	0	4

	The selected machine axis can be traversed to the corresponding fixed point with the traversing keys or the handwheel as soon as the function is active (see DB39xx.DBX1001.0 to .2). The fixed points are defined using machine data MD30600.
Corresponds with	DB39xx.DBX1001.0 to .2 (JOG fixed-point approach active) DB39xx.DBX1001.3 to .5 (JOG fixed-point approach reached) MD30600 $MA_FIX_POINT_POS[<n>] (fixed value positions of the axis)
More information	• Function Manual SINUMERIK 828D Axes and Spindles

DB38xx.DBX1001.3, JOG to position

Table 10-369 DB38xx.DBX1001.3, JOG travel to position

DB38xx.DBX1001.3	**JOG travel to position** **Signals to axis/spindle: PLC → NC**
Update	cyclic
Signal state 1	The function "Position travel in JOG" is requested:
Signal state 0	The function "Position travel in JOG" is **not** requested:
Description	As soon as the function is active (see DB39xx.DBX1001.6), then using the traversing keys or the handwheel, the selected machine axis can be traversed to the position specified with setting data SD43320. **Application** The function is used for machine tools that are exclusively operated manually, e.g. to approach drill-holes in precise increments. **Note** The following preconditions applying for the "Position travel in JOG" function: • The function can only be activated in the JOG mode. The function cannot be activated if the machine function JOG-REPOS or JOG-REF is active and in JOG in AUTOMATIC. • The axis to be traversed must be referenced. • A kinematic transformation may not be active. • The axis to be traversed may not be a following axis of an active coupling.
Corresponds with	DB39xx.DBX1001.6 (JOG travel to position active) DB39xx.DBX1001.7 (JOG position reached) SD43320 $SA_JOG_POSITION (JOG position)
More information	• Function Manual SINUMERIK 828D Axes and Spindles

DB38xx.DBX1002.0, suppress program test

Table 10-370 DB38xx.DBX1002.0, suppress program test

DB38xx.DBX1002.0	**Suppress program test** **Signals to axis/spindle: PLC → NC**
Update	cyclic
Signal state 1	Suppression of the program test (setpoint output locked) is requested.
Signal state 0	Suppression of the program test (setpoint output locked) is **not** requested.
Description	If function "Program test" (PRT) is active in the channel to which the axis currently belongs, the axis is traversed with internal axis disable. Setpoints are generated but they not output to the machine axes. Actual value = Setpoint. If the program test is suppressed for the axis, setpoints are output to the machine axis despite the function "program test" being active in the channel to which the axis currently belongs. **Automatic transfer of the interface signals** The HMI request signals DB25xx.DBX5004.0 and .1 are only transferred from the basic PLC program to the PLC request signals DB320x.DBX1002.0 and .1 if FB1 parameter **MMCToIF** is set to **TRUE**. If the parameter is not set, the PLC request signals must be set by the PLC user program.

DB38xx.DBX1002.0	**Suppress program test** **Signals to axis/spindle: PLC → NC**
Corresponds with	DB38xx.DBX1002.1 (activate program test) DB37xx.DBX1000.0 (suppress program test) DB37xx.DBX1000.1 (activate program test)
More information	• Function Manual Basic Functions

Table 10-371 DB380x.DBX1002.1, activate program test

DB380x.DBX1002.1	**Activate program test** **Signals to axis/spindle: PLC → NC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	Activation of the program test is requested. During the program test, all motion commands of axes (not spindles) take place under "Axis disable". Notice! Because of the axis disable, the assignment of a tool magazine is not changed during program testing. The user / machine manufacturer must use a suitable PLC user program to ensure that the NC-internal tool management and the actual assignment of the tool magazine remain consistent. Refer to the program example included in the PLC Toolbox.	
Signal state 0	Activation of the program test is not requested.	
See also	Table 10-124 DB1700.DBX1.7, program test selected (Page 217) Table 10-291 DB3300.DBX1.7, program test active (Page 294)	
More information	• Function Manual SINUMERIK 828D basic functions	

Signals to spindle

Table 10-372 DB380x.DBX2000.0 to .2, actual gear stage A to C

DB380x.DBX2000.0 to .2	**Actual gear stage A to C** **Signals to axis/spindle: PLC → NC**			
Edge evaluation: Yes	Signal updated: cyclic			
Edge change 0 → 1	If the new gear stage is engaged, then the PLC user sets the "Actual gear stage A" to "...C" signals and the "Gear is changed over" signal. This signals the NC that the correct gear stage has been successfully engaged. The gear change is considered to have been completed (spindle oscillation mode is deselected), the spindle accelerates in the new gear stage to the last programmed spindle speed and the next block in the part program can be executed. The actual gear stage is output in coded format (ABC values). For each of the five gear stages, there is one set of parameters assigned as follows:			
	Parameter set no.	CBA code	Data of the data set	Contents
	0	-	Data for axis mode	Servo gain factor Monitoring
	1	000	Data for 1st gear stage	M40 speed
		001		Min/max speed Acceleration
	2	010	Data for 2nd gear stage	etc.
	3	011	Data for 3rd gear stage	
	4	100	Data for 4th gear stage	
	5	101	Data for 5th gear stage	
		110		
		111		
Special cases, errors, etc.	If the PLC user reports back to the NC with a different actual gear stage than issued by the NC as the set gear stage, the gear change is still considered to have been successfully completed and the actual gear stage A to C is activated.			
See also	Table 10-445 DB390x.DBX2000.0 to .2, set gear stage A to C (Page 372) Table 10-446 DB390x.DBX2000.3, change gear stage (Page 373) Table 10-373 DB380x.DBX2000.3, gear is changed over (Page 336) Table 10-380 DB380x.DBX2002.5, oscillation speed (Page 340)			
More information	• Function Manual SINUMERIK 828D Axes and Spindles			

Table 10-373 DB380x.DBX2000.3, gear is changed over

DB380x.DBX2000.3	**Gear is changed over** **Signals to axis/spindle: PLC → NC**	
Edge evaluation: Yes	Signal updated: cyclic	
Edge change 0 → 1	If the new gear stage is engaged, then the PLC user sets the "Actual gear stage A to C" signal and the "Gear is changed over" signal. This signals the NC that the correct gear stage has been successfully engaged. The gear change is considered to have been completed, spindle oscillation mode is deselected. The spindle accelerates in the new gear stage to the last programmed spindle speed and the next block in the part program can be executed. The NC resets the "Change gear stage" signal and then the PLC user program resets the "Gear is changed over" signal.	
Edge change 1 → 0	No effect.	

DB380x.DBX2000.3	Gear is changed over Signals to axis/spindle: PLC → NC
Signal irrelevant for ...	spindle modes other than the oscillation mode.
Special cases, errors, etc.	If the PLC user reports back to the NC with a different actual gear stage than issued by the NC as the set gear stage, the gear change is still considered to have been successfully completed and the actual gear stage A to C is activated.
See also	Table 10-372 DB380x.DBX2000.0 to .2, actual gear stage A to C (Page 336) Table 10-445 DB390x.DBX2000.0 to .2, set gear stage A to C (Page 372) Table 10-380 DB380x.DBX2002.5, oscillation speed (Page 340) Table 10-446 DB390x.DBX2000.3, change gear stage (Page 373)
More information	• Function Manual SINUMERIK 828D Axes and Spindles

Table 10-374 DB380x.DBX2000.4 and .5, resynchronize spindle 1/2

DB380x.DBX2000.4 DB380x.DBX2000.5	Resynchronize spindle 1 Resynchronize spindle 2 Signals to axis/spindle: PLC → NC	
Edge evaluation: Yes	Signal updated: cyclic	
Edge change 0 → 1	The spindle is to be resynchronized because the synchronization between the position measuring system of the spindle and the 0° position has been lost.	
Edge change 1 → 0	No effect.	
Signal irrelevant for ...	Spindle modes other than the control mode.	
Application	The machine has a selector switch for a vertical and horizontal spindle. Two different position measuring encoders are required, but only one actual value input is used at the control. When the system switches from the vertical to the horizontal spindle, the spindle must be re-synchronized. This synchronization is triggered by the "Resynchronize spindle 1/2" signal.	
See also	Table 10-405 DB390x.DBX0.4, referenced/synchronized 1 (Page 354) Table 10-406 DB390x.DBX0.5, referenced/synchronized 2 (Page 354)	
More information	• Function Manual SINUMERIK 828D Axes and Spindles	

Table 10-375 DB380x.DBX2000.7, delete S value

DB380x.DBX2000.7	Delete S value Signals to axis/spindle: PLC → NC	
Edge evaluation: Yes	Signal updated: cyclic	
Edge change 0 → 1	Control mode: • Spindle stops • Program continues to run • Spindle continues to run with the following S value, if `M3` or `M4` were active Oscillation mode, axis mode, positioning mode: Signal has no effect. However, if the open-loop control mode is selected again, a new S value must be programmed.	
Edge change 1 → 0	No effect.	

DB380x.DBX2000.7	**Delete S value** **Signals to axis/spindle: PLC → NC**
Application	Terminating traversing motion on account of an external signal, e.g. probe.
More information	• Function Manual SINUMERIK 828D Axes and Spindles

Table 10-376 DB380x.DBX2001.0, feedrate override for spindle valid (instead of spindle override)

DB380x.DBX2001.0	**Feedrate override for spindle valid (instead of spindle override)** **Signals to axis/spindle: PLC → NC**
Edge evaluation: Yes	Signal updated: cyclic
Edge change 0 → 1	Instead of the value for the "Spindle override" signal, the value of the "Feedrate override (axis-specific)" signal is used for the spindle.
Edge change 1 → 0	The value of the "Spindle override" signal is used.
See also	Table 10-382 DB380x.DBB2003, spindle override (Page 342) Table 10-342 DB380x.DBB0, feedrate override (axis-specific) (Page 316) Table 10-349 DB380x.DBX1.7, override active (Page 321)
More information	• Function Manual SINUMERIK 828D Axes and Spindles

Table 10-377 DB380x.DBX2001.4, resynchronize spindle 1/2

DB380x.DBX2001.4	**Resynchronize spindle 1/2** **Signals to axis/spindle: PLC → NC**
Edge evaluation: Yes	Signal updated: cyclic
Edge change 0 → 1	When positioning, the spindle must be resynchronized.
Edge change 1 → 0	No effect.
Application	The spindle has an indirect measuring system and slip may occur between the motor and the clamp. If the signal = 1 when positioning is started, the old reference is deleted and the zero mark is searched for again before the end position is approached.
Signal irrelevant for ...	Spindle modes other than the positioning mode.
See also	Table 10-405 DB390x.DBX0.4, referenced/synchronized 1 (Page 354)
More information	• Function Manual SINUMERIK 828D Axes and Spindles

Table 10-378 DB380x.DBX2001.6, invert M3/M4

DB380x.DBX2001.6	**DB380x.DBX2001.6, invert M3/M4** **Signals to axis/spindle: PLC → NC**
Edge evaluation: Yes	Signal updated: cyclic
Edge change 0 → 1	The direction of rotation of the spindle motor changes for the following functions: • M3 • M4 • M5 • SPOS from the motion; not active for SPOS from standstill
Edge change 1 → 0	No effect.

DB380x.DBX2001.6	**DB380x.DBX2001.6, invert M3/M4** **Signals to axis/spindle: PLC → NC**
Application	The machine has a selector switch for a vertical and horizontal spindle. The mechanical design is implemented so that for the horizontal spindle, an additional gearwheel is engaged than for the vertical spindle. The direction of rotation must therefore be changed for the vertical spindle if the spindle is always to rotate clockwise with `M3`.
More information	• Function Manual SINUMERIK 828D Axes and Spindles

Table 10-379 DB380x.DBX2002.4, oscillation via the PLC

DB380x.DBX2002.4	**Oscillation via the PLC** **Signals to axis/spindle: PLC → NC**	
Edge evaluation: Yes	Signal updated: cyclic	
Edge change 0 → 1	If the "Oscillation via the PLC" signal is set, then with the "Oscillation speed" signal, a speed is output in conjunction with the "Set direction of rotation, clockwise and counterclockwise" signal.	
Edge change 1 → 0	If the "Oscillation via the PLC" signal is not set, then automatic oscillation is executed in the NC with the "Oscillation speed" signal. Both times for the directions of rotation are entered in MD35440 and MD35450.	
Application	If the new gear stage cannot be engaged in spite of several attempts by the NC, the system can be switched to oscillation via the PLC. Both times for the directions of rotation can be altered by the PLC user program as required. This ensures that the gear stage is reliably changed, even with unfavorable gear wheel positions.	
See also	Table 10-380 DB380x.DBX2002.5, oscillation speed (Page 340) Table 10-381 DB380x.DBX2002.7 and .6, set direction of rotation, counterclockwise and clockwise (Page 340) MD35440 $MA_ SPIND_OSCILL_TIME_CW: Oscillation time for the M3 direction MD35450 $MA_SPIND_OSCILL_TIME_CCW: Oscillation time for the M4 direction	
More information	• Function Manual SINUMERIK 828D Axes and Spindles	

Table 10-380 DB380x.DBX2002.5, oscillation speed

DB380x.DBX2002.5	**Oscillation speed** **Signals to axis/spindle: PLC → NC**
Edge evaluation: No	Signal updated: cyclic
Signal state 1	If the gear stage is to be changed, then the spindle mode changes to oscillation mode - the "Change gear stage" signal is set. Depending on when the "Oscillation speed" signal is set, the spindle brakes to standstill with different decelerations: 1. The "Oscillation speed" signal is set before the "Change gear stage" signal is set by the NC. The spindle is braked to standstill with the acceleration when oscillating (MD35410). Oscillation starts immediately when the spindle is stationary. 2. The "Oscillation speed" signal is enabled after the "Change gear stage" signal has been set by the NC and when the spindle is stationary. The position control is deactivated. The spindle decelerates with the deceleration in the speed-controlled mode. After the "Oscillation speed" has been set, the spindle starts to oscillate with the oscillation acceleration (MD35410). If the "Oscillation via the PLC" signal is not set, then automatic oscillation is executed in the NC with the "Oscillation speed" signal. Both times for the directions of rotation are entered in MD35440 and MD35450. If the "Oscillation via the PLC" signal is set, then with the "Oscillation speed" signal, a speed is output in conjunction with the "Set direction of rotation, clockwise and counterclockwise" signal.
Signal state 0	The spindle does not oscillate.
Application	The oscillation speed is used to make it easier to engage a new gear stage.
Signal irrelevant for ...	All spindle modes except the oscillation mode.
See also	Table 10-379 DB380x.DBX2002.4, oscillation via the PLC (Page 339) Table 10-381 DB380x.DBX2002.7 and .6, set direction of rotation, counterclockwise and clockwise (Page 340)
More information	• Function Manual SINUMERIK 828D Axes and Spindles

Table 10-381 DB380x.DBX2002.7 and .6, set direction of rotation, counterclockwise and clockwise

DB380x.DBX2002.6 **DB380x.DBX2002.7**	**Set direction of rotation clockwise** **Set direction of rotation, counterclockwise** **Signals to axis/spindle: PLC → NC**
Edge evaluation: Yes	Signal updated: cyclic
Edge change 0 → 1	If the "Oscillation via the PLC" signal is set, then the direction of rotation for the oscillation speed can be specified using the two "Set direction of rotation, counterclockwise and clockwise" signals. The times for the oscillation movement of the spindle motor are defined by setting the "Set direction of rotation, counterclockwise and clockwise" signal for an appropriate length of time.
Edge change 0 → 1	No effect.
Application	See Table 10-379 DB380x.DBX2002.4, oscillation via the PLC (Page 339)
Special cases, errors, etc.	• If both interface signals are set simultaneously, no oscillation speed is output • If no interface signal is set, then no oscillation speed is output
Signal irrelevant for ...	spindle modes other than oscillation mode.

DB380x.DBX2002.6 **DB380x.DBX2002.7**	**Set direction of rotation clockwise** **Set direction of rotation, counterclockwise** **Signals to axis/spindle: PLC → NC**
See also	Table 10-380 DB380x.DBX2002.5, oscillation speed (Page 340) Table 10-379 DB380x.DBX2002.4, oscillation via the PLC (Page 339)
More information	• Function Manual SINUMERIK 828D Axes and Spindles

Table 10-382 DB380x.DBB2003, spindle override

DB380x.DBB2003	**Spindle override** **Signals to channel: PLC → NC**		
Edge evaluation: No		Signal updated: cyclic	
Signal state 1	The spindle override is specified via the PLC in Gray code. The override value determines the percentage of the programmed speed setpoint that is issued to the spindle.		
	Switch setting	Code	Spindle override factor
	1	00001	0.5
	2	00011	0.55
	3	00010	0.60
	4	00110	0.65
	5	00111	0.70
	6	00101	0.75
	7	00100	0.80
	8	01100	085
	9	01101	0.90
	10	01111	0.95
	11	01110	1.00
	12	01010	1.05
	13	01011	1.10
	14	01001	1.10
	15	01000	1.15
	16	11000	1.20
	17	11001	1.20
	18	11011	1.20
	19	11010	1.20
	20	11110	1.20
	21	11111	1.20
	22	11101	1.20
	23	11100	1.20
	24	10100	1.20
	25	10101	1.20
	26	10111	1.20
	27	10110	1.20
	28	10010	1.20
	29	10011	1.20
	30	10001	1.20
	31	10000	1.20
See also	Table 10-349 DB380x.DBX1.7, override active (Page 321) Table 10-376 DB380x.DBX2001.0, feedrate override for spindle valid (instead of spindle override) (Page 338)		
More information	• Function Manual SINUMERIK 828D Axes and Spindles		

Signals to drive

Table 10-383 DB380x.DBB4001.0 to .4, motor/drive data set: Selection

DB380x.DBB4001.0 to .4	**Motor/drive data set: Selection** **Signals to drive: PLC → NC**	
Edge evaluation: No	Signal updated: cyclic	
Description	The switchover to a new motor (MDS) and/or to drive data sets (DDS) is requested via the interface.	
	Formatting Formatting the request interface, i.e. which bits are used to address the motor data sets (MDS) – and which are used to address the drive data sets (DDS) is set via the formatting interface (DB390x., ...DBX4008.0 ... 4).	
	Main spindle drive For main spindle drives, the following classification applies: • MDS[0] → star operation • MDS[1] → delta operation	
	Switchover time In principle it is possible to switch over drive parameter sets at any time. However, as torque jumps can occur when switching over speed controller parameters and motor speed normalization, parameters should only be switched over in stationary states, especially axis standstill. As soon as the request to switch over to another motor data set is identified, the pulses enable is reset.	
Application	Drive parameter switchover can be used for the following: • Changing the gear stage • Changing the measuring circuit	
Special cases, errors, etc.	In principle it is possible to switch over drive parameter sets at any time. However, as torque jumps can occur when switching over speed controller parameters and motor speed normalization, parameters should only be switched over when in the zero speed state (especially when the axis is stationary).	
See also	Table 10-465 DB390x.DBX4001.0 to .4, motor/drive data set: Display (Page 380) Table 10-481 DB390x.DBX4008.0 - 4, motor/drive data set: Formatting (Page 388) Table 10-384 DB380x.DBX4001.5, motor is being selected (Page 343)	
More information	• Function Manual SINUMERIK 828D Axes and Spindles	

Table 10-384 DB380x.DBX4001.5, motor is being selected

DB380x.DBX4001.5	**Motor being selected** **Signals to drive: PLC → NC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The necessary electrical and/or mechanical switchover operations (e.g. contactor switchover for star-delta switchover) have been completed: • It is permissible that the axis traverses again • The drive enables the pulses	

DB380x.DBX4001.5	**Motor being selected** **Signals to drive: PLC → NC**
Signal state 0	The necessary electrical (e.g. contactor switchover for star-delta switchover) and/or mechanical switchovers have **not** been completed: • It is not permissible that the axis traverses • The drive does not enable the pulses
See also	Table 10-383 DB380x.DBB4001.0 to .4, motor/drive data set: Selection (Page 343) Table 10-465 DB390x.DBX4001.0 to .4, motor/drive data set: Display (Page 380) Table 10-481 DB390x.DBX4008.0 - 4, motor/drive data set: Formatting (Page 388)
More information	• Function Manual SINUMERIK 828D monitoring and compensating

Table 10-385 DB380x.DBX4001.6, speed controller integrator disable

DB380x.DBX4001.6	**Integrator disable, speed controller** **Signals to drive: PLC → NC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The speed controller integrator is disabled. The speed controller is switched from PI to P controller. Note: If the speed controller integrator disable is activated, compensations might take place in certain applications (e.g. if the integrator was already holding a load while stationary). The integrator disable is acknowledged from the drive: Signal "DB390x.DBX4001.6, speed controller integrator disable".	
Signal state 0	The integrator of the speed controller is enabled.	
Description	If the speed controller integrator disable is activated, compensatory action may be taken, e.g. if the integrator was already holding a load while stationary. The feedback signal regarding the speed controller disable is realized from the drive using: DB390x.DBX4001.6, (speed controller integrator disable)	
See also	Table 10-467 DB390x.DBX4001.6, speed controller integrator disable (Page 381)	
More information	• Function Manual SINUMERIK 828D basic functions	

Table 10-386 DB380x.DBX4001.7, pulse enable

DB380x.DBX4001.7	**Pulse enable** **Signals to drive: PLC → NC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The pulse enable is signaled by the PLC for this drive (axis/spindle). The pulses are only enabled if the drive signals "Drive ready" with signal "1". In this case, the interface signal "Pulses enabled" = "1" is signaled to the PLC.	
Signal state 0	The pulses are disabled by the PLC for this drive.	
Application	Safety-related signal.	
Special cases, errors, etc.	If the pulse enable is canceled for a moving axis/spindle, it is no longer braked in a controlled manner. The axis/spindle coasts to standstill.	
See also	Table 10-468 DB390x.DBX4001.7, pulse enable (Page 381) Table 10-466 DB390x.DBX4001.5, drive ready (Page 381)	
More information	• Function Manual SINUMERIK 828D basic functions	

Signals to technology functions

Table 10-387 DB380x.DBX5000.1, control axes

DB380x.DBX5000.1	**Controlling axes** **Signals to drive: PLC → NC**	
Edge evaluation: No	Signal updated: Job-controlled	
Signal state 1	The axis-specific function "Control axis" is set with the machine data $MA_30460_BASE_FUNCTION_MASK. Bit 0 = 1: The axis traverses in speed mode	
Signal state 0	Bit 0 = 0: Axis control is not allowed	
See also	Axis-specific machine data $MA_30460_BASE_FUNCTION_MASK	
More information	• Parameter Manual for SINUMERIK 828D machine data	

Table 10-388 DB380x.DBX5000.4, torque compensation controller on

DB380x.DBX5000.4	**Torque compensation controller on** **Signals to drive: PLC → NC**	
Edge evaluation: Yes	Signal updated: cyclic	
Edge change 0 → 1	Torque compensation controller is to be activated. The following condition must be fulfilled for activation: "Master/slave fine" signal = "1"	
Edge change 1 → 0	Torque compensation controller is to be deactivated.	
See also	Table 10-482 DB390x.DBX5000.2, master/slave fine (Page 388)	

DB380x.DBX5000.5, take over control of drive

Table 10-389 DB3800.DBX5000.5, take over control of drive

DB3800.DBX5000.5	**Take over control of drive** **Signals to drive: PLC → NC**
Edge evaluation: No	Signal updated: cyclic
Signal state 1	Taking over drive control is requested.
Signal state 0	Taking over drive control is not requested.
Description	• If the request to take over the drive control is active simultaneously in multiple axes, switch-over does not occur. The drive control then remains with the axis in which it is currently active. • If no transfer requests are active during control system run-up, drive control is assigned by the control to the first of the axes found in the machine data (MD30110 $MA_CTRLOUT_MODULE_NR[<Axis>]) with the same logical drive number.
See also	DB390**x**.DBX5000.5, control over the drive taken over (Page 389)

Table 10-390 DB380x.DBX5004.7, master/slave on

DB380x.DBX5000.7	**Master/slave on** **Signals to technology functions: PLC → NC**	
Edge evaluation: Yes	Signal updated: cyclic	
Edge change 0 → 1	Master-slave coupling should be activated.	
Edge change 1 → 0	Master-slave coupling should be deactivated.	
Application	The following conditions must be fulfilled for activation and deactivation: • Master and slave axes in position control, "Position controller active" signal • Master and slave axes are stationary, "Axis/spindle stationary ($n < n_{min}$)" signal • The channel of the master and slave axes is in the reset state, "Channel state reset" signal If a condition is not fulfilled, the coupling will not be activated or deactivated. No alarm appears and the state of the coupling remains the same. If, at a later point, all conditions are fulfilled, the coupling will be activated or deactivated depending on the state of the signal. The signal is relevant for the slave axis of a coupling.	
See also	Table 10-414 DB390x.DBX1.5, position controller active (Page 358) Table 10-413 DB390x.DBX1.4, axis/spindle stationary (n < nmin) (Page 357) Table 10-299 DB3300.DBX3.7, channel status reset (Page 297)	

DB38xx.DBX5002.4, enable following axis override

Table 10-391 DB38xx.DBX5002.4, enable following axis override

DB38xx.DBX5002.4	**Enable following axis override** **Signals to axis/spindle: PLC → NC**
Update	cyclic
Signal state 1	Additional traversing motion can be overlaid on the following axis.
Signal state 0	The following axis **cannot** be overlaid and traversed.
Description	This signal is required for the flying synchronization of master and slave axes. As long as the "Enable following axis overlay" signal stays set to "1", the following axis selected with `EGONSYN` will traverse to synchronization in the EG coupling group. If the EG axis grouping includes modulo axes, their position values are reduced in the modulo, thereby ensuring that they approach the next possible synchronization. If, for the following axis "Enable following axis overlay" has **not** been set, then the axis it does not traverse to synchronization. Instead, the program is stopped at the `EGONSYN` block and the self-clearing alarm 16771 is issued.
More information	• Function Manual SINUMERIK 828D Axes and Spindles

DB38xx.DBX5004.0, oscillation reversal from external

Table 10-392 DB38xx.DBX5004.0, oscillation reversal from external

DB38xx.DBX5004.0	Oscillation reversal from external Signals to axis/spindle: PLC → NC
Update	cyclic
Edge change 0 → 1	Brake oscillation motion and move oscillation axis in the opposite direction with the oscillation axis.
Edge change 1 → 0	Continue oscillation without interruption
More information	• Function Manual SINUMERIK 828D Axes and Spindles

DB38xx.DBX5004.1, reset

Table 10-393 DB38xx.DBX5004.1, PC-controlled axis: Reset

DB38xx.DBX5004.1	PLC-controlled axis: Reset Signals to axis/spindle: PLC → NC
Update	cyclic
Edge change 0 → 1	PLC-controlled axis: Reset is requested
Edge change 1 → 0	No effect.
Description	NC responses: • The axis is transitioned into the "Single axis in Reset" status: $AA_SNGLAX_STAT == 1 • Stopped sequences are canceled. • Internal axis states are reset. • Axis specific, machine data active at reset become active. • Execution is confirmed: – DB39xx.DBX3.0 (reset executed) == 1 – DB39xx.DBX3.2 (axis stop active) == 0 • Result: The axis is in the reset state. **Note** In conjunction with a channel reset, no axial machine data is active for axes controlled from the PLC.
Corresponds with	DB38xx.DBX5004.7 (PC controls axis) DB39xx.DBX3.1 (reset executed) DB39xx.DBX3.2 (axis stop active) System variable: $AA_SNGLAX_STAT (status of the single axis) OPI variable: aaSnglAxStat
More information	• Function Manual SINUMERIK 828D Axes and Spindles

DB38xx.DBX5004.2, continue

Table 10-394 DB38xx.DBX5004.2, PLC-controlled axis: Resume

DB38xx.DBX5004.2	**PLC-controlled axis: Resume** **Signals to axis/spindle: PLC → NC**
Update	cyclic
Edge change 0 → 1	PLC-controlled axis: Resume uninterrupted traversing motion is requested
Edge change 1 → 0	No effect.
Description	Using the signal, the traversing motion of an axis - controlled from the PLC - which is in the "Single axis is interrupted" status ($AA_SNGLAX_STAT = 3), is resumed. NC responses: • Checks whether, for the axis, an axis-specific alarm with delete criterion "CANCELCLEAR" or "NCSTARTCLEAR" is present? If yes, then this is deleted. • Checks whether axis motion can be resumed? If yes, then the axis makes the transition into the "Single axis is active" state. $AA_SNGLAX_STAT == 4 • Execution is confirmed: – DB39xx.DBX0.6 (position reached with exact stop coarse) == 0 – DB39xx.DBX0.7 (position reached with exact stop fine) == 0 – DB39xx.DBX3.2 (axis stop active) == 0 – DB39xx.DBX4.6 and 7 (traversing command "plus"/"minus") == 1 • Result: Traversing motion of the axis is resumed. **Note** The signal is ignored in the following cases: • The axis is not controlled by the PLC. • The axis is not in the "Single axis is interrupted" status. • It is not permissible that axis traversing motion resumes due to an active alarm.
Corresponds with	DB38xx.DBX5004.6 (PLC-controlled axis: Stop along braking ramp) DB38xx.DBX5004.7 (PC controls axis) DB39xx.DBX0.6 (position reached with exact stop coarse) DB39xx.DBX0.7 (position reached with exact stop fine) DB39xx.DBX3.2 (axis stop active) DB39xx.DBX4.6 (traversing command "minus") DB39xx.DBX4.7 (traversing command "plus") System variable: $AA_SNGLAX_STAT (status of the single axis) OPI variable: aaSnglAxStat
More information	• Function Manual SINUMERIK 828D Axes and Spindles

DB38xx.DBX5004.3, set reversal point

Table 10-395 DB38xx.DBX5004.3, set reversal point

DB38xx.DBX5004.3	Set reversal point Signals to axis/spindle: PLC → NC
Update	cyclic
Signal state 1	Reversal point 2
Signal state 0	Reversal point 1

DB38xx.DBX5004.4, change reversal point

Table 10-396 DB38xx.DBX5004.4, change reversal point

DB38xx.DBX5004.4	Change reversal point Signals to axis/spindle: PLC → NC
Update	cyclic
Signal state 1	The reversal point position can be changed by manually traversing the axis. In conjunction with DB38xx.DBX5004.0 (oscillation reversal from external): The position at which the axis is braked after "oscillation reversal from external", should be the new reversal point.
Signal state 0	The reversal point position **cannot** be changed by manually traversing the axis. In conjunction with DB38xx.DBX5004.0 (oscillation reversal from external): No change of the reversal point position.
Description	The braking position of the axis can be accepted as the new reversal position by means of the signal DB38xx.DBX5004.4 (change reversal position). The signal DB38xx.DBX5004.3 (set reversal point) is ignored, but rather the change affects the last initiated "Oscillation reversal from external" command. **Note** For the axis, it is not permissible that changing the reversal points via traversing keys or handwheel is active. In this case, display alarm 20081 "Braking position cannot be used as reversal point - handwheel active "is signaled.
Corresponds with	DB38xx.DBX5004.0 (oscillation reversal from external) DB38xx.DBX5004.3 (set reversal point)

DB38xx.DBX5004.5, stop at next reversal point

Table 10-397 DB38xx.DBX5004.5, PLC-controlled axis: Stop at the next reversal point

DB38xx.DBX5004.5	PLC-controlled axis: Stop at the next reversal point Signals to axis/spindle: PLC → NC
Update	cyclic
Signal state 1	Interrupt oscillation motion of the PLC-controlled axis at the next reversal point.

DB38xx.DBX5004.5	**PLC-controlled axis: Stop at the next reversal point** **Signals to axis/spindle: PLC → NC**
Signal state 0	There is no request to interrupt the oscillation motion of the PLC-controlled axis at the next reversal point.
Corresponds with	DB38xx.DBX5004.6 (PLC-controlled axis: Stop along braking ramp) DB38xx.DBX5004.7 (PC controls axis)

DB38xx.DBX5004.6, stop along braking ramp

Table 10-398 DB38xx.DBX5004.6, PC-controlled axis: Stop along braking ramp

DB38xx.DBX5004.6	**PLC-controlled axis: Stop along braking ramp** **Signals to axis/spindle: PLC → NC**
Update	cyclic
Signal state 1	PLC-controlled axis: Braking the axis along a braking ramp is requested.
Signal state 0	PLC-controlled axis: Braking the axis along a braking ramp is **not** requested.
Description	Using the signal, the traversing motion of an axis - controlled from the PLC - can be stopped. NC responses: • The axis is braked down to standstill along its deceleration characteristic. • The axis is transitioned into the "Single axis is interrupted" status: $AA_SNGLAX_STAT == 3 • Execution is confirmed: – DB39xx.DBX0.6 (position reached with exact stop coarse) == 1 – DB39xx.DBX0.7 (position reached with exact stop fine) == 1 – DB39xx.DBX3.2 (axis stop active) == 0 – DB39xx.DBX4.6 and 7 (traversing command "plus"/"minus") == 0 • Result: Axis is stopped. **Note** Following axis movements can only be suppressed when the leading axis stops. Retraction motion triggered by the "Extended stop and retract" function cannot be stopped.
Corresponds with	DB38xx.DBX5004.5 (PC-controlled axis: Stop at the next reversal point) DB38xx.DBX5004.7 (PC controls axis) DB39xx.DBX0.6 (position reached with exact stop coarse) DB39xx.DBX0.7 (position reached with exact stop fine) DB39xx.DBX3.2 (axis stop active) DB39xx.DBX4.6 (traversing command "minus") DB39xx.DBX4.7 (traversing command "plus") System variable: $AA_SNGLAX_STAT (status of the single axis) OPI variable: aaSnglAxStat
More information	• Function Manual SINUMERIK 828D Axes and Spindles

DB38xx.DBX5004.7, PC controls axis

Table 10-399 DB38xx.DBX5004.7, request PC controls axis

DB38xx.DBX5004.7	Request PLC-controlled axis Signals to axis/spindle: PLC → NC
Update	cyclic
Signal state 1	Axis control should be relinquished to the PLC.
Signal state 0	There is no request that axis control is transferred to the PLC.
Description	NC responses: • Checks whether the axis is a main run axis or a neutral axis. • Checks whether an additional axis may be controlled from the PLC. • Transfer is confirmed: – DB39xx.DBX3.1 (PC controls axis) == 1 – $AA_SNGLAX_STAT == 1 • Result: PLC controls axis.
Corresponds with	DB39xx.DBX3.1 (PLC controls axis) System variable: $AA_SNGLAX_STAT (status of the single axis) OPI variable: aaSnglAxStat
More information	• Function Manual SINUMERIK 828D Axes and Spindles

Table 10-400 DB380x.DBX5005.4, start gantry synchronization

DB380x.DBX5005.4	Start gantry synchronization Signals to drive: PLC → NC	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	Request from PLC user program to synchronize the leading axis with the assigned synchronized axes: MD37100 $MA_GANTRY_AXIS_TYPE gantry axis definition. I.e. all gantry axes approach the reference position of the gantry grouping in the decoupled state. Synchronization of the gantry axes can be started only under the following conditions: • The REF machine function must be active: "Active REF machine function" signal = 1 • "Gantry grouping is synchronized" signal = 0 • "Gantry synchronization ready to start" signal = 1 • Axes are not referenced in the relevant NC channel: "Referencing active" signal = 0	
Signal state 0	The PLC user program can reset the interface signal to signal state "0" when gantry synchronization has been completed; the signal Gantry grouping is synchronized = 1. If the signal were set continuously to "1", the gantry synchronization run would be started automatically as soon as the above conditions are met.	
Signal irrelevant for ...	Gantry synchronous axis	
Application	If the deviation between the actual position values and the reference position is greater than the gantry warning threshold after referencing of the gantry axes, automatic gantry synchronization is not started and the "Gantry synchronization ready to start" signal is set to "1". Synchronization of the gantry axes can be started by the operator or the PLC user program with the "Start gantry synchronization" signal.	

DB380x.DBX5005.4	**Start gantry synchronization** **Signals to drive: PLC → NC**
See also	Table 10-149 DB1800.DBX1.2, active REF machine function (Page 227) Table 10-285 DB3300.DBX1.0, referencing active (Page 292) Table 10-504 DB390x.DBX5005.5, gantry grouping is synchronized (Page 396) Table 10-503 DB390x.DBX5005.4, gantry synchronization ready to start (Page 396)
More information	• Function Manual SINUMERIK 828D Axes and Spindles

Table 10-401 DB380x.DBX5005.5, disable automatic synchronization

DB380x.DBX5005.5	**Disable automatic synchronization** **Signals to drive: PLC → NC**
Edge evaluation: No	Signal updated: cyclic
Signal state 1	No automatic synchronization.
Signal state 0	Automatic synchronization is active.
Signal irrelevant for ...	Gantry synchronous axis
Application	The automatic synchronization can be disabled by sending a VDI signal to the axial PLC → NC interface of the master axis. This always makes sense when the axes are not activated by default. In this case, the synchronization should also be started explicitly.
More information	• Function Manual SINUMERIK 828D Axes and Spindles

DB38xx.DBX5007.5, disable synchronization

Table 10-402 DB38xx.DBX5007.5, disable synchronization

DB38xx.DBX5007.5	**Disable synchronization** **Signals to axis/spindle: PLC → NC**
Update	cyclic
Signal state 1	Synchronous spindle coupling: The PLC blocks synchronization motion for the following spindle specified by offset programming.
Signal state 0	Synchronous spindle coupling: The PLC does **not** block synchronization motion for the following spindle specified by offset programming.
Description	When the main run advances to a block with the part program statement `COUPON(<FS>,<LS>,<offset>)`, then interface signal DB38xx.DBX5007.5 (disable synchronization) is evaluated for the following spindle: • For DB38xx.DBX5007.5 == 1, only continuous velocity synchronous operation is established. The following spindle does not execute any additional movement. The coupling then responds analogously to a programmed `COUPON(<FS>,<LS>)`. • For DB38xx.DBX5007.5 == 0, the axis only moves through the position offset.
Corresponds with	DB39xx.DBX2002.4 (Active spindle mode: synchronous mode) DB39xx.DBX5002.1 (synchronism coarse) DB39xx.DBX5002.0 (synchronism fine)
More information	• Function Manual SINUMERIK 828D Axes and Spindles

10.2.6.4 Signals from axis/spindle

General signals from axis/spindle

Table 10-403 DB390x.DBX0.0, spindle / no axis

DB390x.DBX0.0	Spindle / no axis Signals from axis/spindle: NC → PLC
Edge evaluation: Yes	Signal updated: cyclic
Edge change 0 → 1	The machine axis is operated as a spindle in the following spindle modes: • Control mode • Oscillation mode • Positioning mode • Tapping without compensating chuck The signals to the axis (DB380x.DBX1000 to DB380x.DBX1003) and from the axis (DB390x.DBX1000 to DB390x.DBX1003) are invalid. The signals to the spindle (DB380x.DBX2000 to DB380x.DBX2003) and from the spindle (DB380x.DBX2000 to DB380x.DBX2003) are invalid.
Edge change 1 → 0	The machine axis is operated as an axis. The signals to the axis (DB380x.DBX1000 to DB380x.DBX1003) and from the axis (DB390x.DBX1000 to DB390x.DBX1003) are valid. The signals to the spindle (DB380x.DBX2000 to DB380x.DBX2003) and from the spindle (DB380x.DBX2000 to DB380x.DBX2003) are valid.
Application	If a spindle is sometimes also used as a rotary axis on a machine tool (turning machine with spindle/C-axis or milling machine with spindle/rotary axis for tapping without compensating chuck), then the "Spindle / no axis" signal can be used to identify as to whether the machine axis is in the axis or spindle mode.
More information	• Function Manual SINUMERIK 828D Axes and Spindles

Table 10-404 DB390x.DBX0.2, encoder limit frequency exceeded 1

DB390x.DBX0.2	Encoder limit frequency exceeded 1 Signals from axis/spindle: NC → PLC
Edge evaluation: No	Signal updated: cyclic
Signal state 1	The limit frequency set in MD36300 has been exceeded. The reference point for the relevant position measuring system has been lost, "Referenced/synchronized" signal = 0. Closed-loop position control is no longer possible. Spindles continue to run with closed-loop speed control. Axes are stopped with a fast stop (with open-circuit position control loop) along a speed setpoint ramp.
Signal state 0	The limit frequency set in MD36300 is no longer exceeded. For the edge change 1 → 0, the encoder frequency must have fallen below the value of MD36302 (% value of MD 36300).
See also	MD36300 $MA_ENC_FREQ_LIMIT: Encoder limit frequency MD36302 $MA_ENC_FREQ_LIMIT_LOW: Encoder limit frequency for encoder resynchronization Table 10-405 DB390x.DBX0.4, referenced/synchronized 1 (Page 354)
More information	• Function Manual SINUMERIK 828D monitoring and compensating

Table 10-405 DB390x.DBX0.4, referenced/synchronized 1

DB390x.DBX0.4	**Referenced/synchronized 1** **Signals from axis/spindle: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	Axes: If the machine axis has reached the reference point (incremental measuring systems) or the target point (length measuring system with distance-coded reference marks) during referencing, then the machine axis is referenced and the "Referenced/synchronized 1" signal (for the position measuring system 1) is set. Spindles: After "Power-on", a spindle is synchronized at the latest after one spindle revolution (zero mark) or when crossing the BERO.	
Signal state 0	The machine axis / spindle with position measuring system 1 is not referenced or synchronized.	
See also	Table 10-348 DB380x.DBX1.5 and .6, position measuring system 1 (PMS1) / position measuring system 2 (PMS2) (Page 320)	
More information	• Function Manual SINUMERIK 828D Axes and Spindles • Function Manual SINUMERIK 828D Basic Functions • Function Manual SINUMERIK 828D Monitoring and Compensating	

Table 10-406 DB390x.DBX0.5, referenced/synchronized 2

DB390x.DBX0.5	**Referenced/synchronized 2** **Signals from axis/spindle: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	Axes: If the machine axis has reached the reference point (incremental measuring systems) or the target point (length measuring system with distance-coded reference marks) during referencing, then the machine axis is referenced and the "Referenced/synchronized 2" signal (for the position measuring system 2) is set. Spindles: After "Power-on", a spindle is synchronized at the latest after one spindle revolution (zero mark) or when crossing the BERO.	
Signal state 0	The machine axis / spindle with position measuring system 2 is not referenced or synchronized. Axes: Alarm 2160 was output. Spindles: Encoder limit frequency exceeded.	
See also	Table 10-348 DB380x.DBX1.5 and .6, position measuring system 1 (PMS1) / position measuring system 2 (PMS2) (Page 320) MD34102 $MA_REFP_SYNC_ENCS: Measuring system calibration = 0	
More information	• Function Manual SINUMERIK 828D Axes and Spindles • Function Manual SINUMERIK 828D basic functions • Function Manual SINUMERIK 828D monitoring and compensating	

Table 10-407 DB390x.DBX0.6, position reached with exact stop coarse

DB390x.DBX0.6	**Position reached with exact stop coarse** **Signals from axis/spindle: NC → PLC**	
Edge evaluation: Yes	Signal updated: cyclic	
Signal state 1	The axis is in the appropriate exact stop and no interpolator is active for the axis and: • The control is in the reset state (reset key or end of program). • The axis was last programmed as a positioning spindle. • The path motion was terminated with NC stop. • The spindle is in position-controlled mode and is stationary. • The axis is switched from speed-controlled to position-controlled mode with the "Position measuring system" signal.	
Signal state 0	The axis is not in the appropriate exact stop or the interpolator is active for the axis or: • The path motion was terminated with NC stop. • The spindle is in speed-controlled mode. • The "Parking" mode is active for the axis. • The axis is switched from position-controlled to speed-controlled mode with the "Position measuring system" signal.	
Signal irrelevant for ...	Rotary axes that are programmed as rounding axes.	
See also	MD36000 $MA_STOP_LIMIT_COARSE: Exact stop coarse Table 10-348 DB380x.DBX1.5 and .6, position measuring system 1 (PMS1) / position measuring system 2 (PMS2) (Page 320)	
More information	• Function Manual SINUMERIK 828D basic functions	

Table 10-408 DB390x.DBX0.7, position reached with exact stop fine

DB390x.DBX0.7	**Position reached with exact stop fine** **Signals from axis/spindle: NC → PLC**	
Edge evaluation: Yes	Signal updated: cyclic	
Signal state 1	See the Table 10-407 DB390x.DBX0.6, position reached with exact stop coarse (Page 355) signal	
Signal state 0	See the Table 10-407 DB390x.DBX0.6, position reached with exact stop coarse (Page 355) signal	
Signal irrelevant for ...	Rotary axes that are programmed as rounding axes.	
See also	MD36010 $MA_STOP_LIMIT_FINE: Exact stop fine	
More information	• Function Manual SINUMERIK 828D basic functions	

DB39xx.DBX1.0, drive test travel request

Table 10-409 DB39xx.DBX1.0, drive test travel request

DB39xx.DBX1.0	**Drive test travel request** **Signals from axis/spindle: NC → PLC**
Update	cyclic
Signal state 1	The travel enable for the drive test is requested, as the travel conditions for the axis are satisfied: • The mechanical brake of the axis involved was previously released. • Axis disable is not active DB38xx.DBX1.3 == 0 The feedback signal is realized using: DB38xx.DBX1.0 == 1
Signal state 0	The travel enable for the drive test is not requested
Corresponds with	DB38xx.DBX1.0 (drive test travel enable)
More information	• Commissioning Manual SINUMERIK 828D Commissioning CNC

Table 10-410 DB390x.DBX1.1, axial alarm

DB390x.DBX1.1	**Axial alarm** **Signals from axis/spindle: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The NC brakes the axis/spindle along a ramp and confirms the braking operation via the NC variable. At the same time, the PLC alarm is signaled with the "Axial alarm" signal == 1 and the state system variable $AA_SNGLAX_STAT == 5 set.	
More information	• Function Manual SINUMERIK 828D Axes and Spindles	

Table 10-411 DB390x.DBX1.2, axis ready

DB390x.DBX1.2	**Axis ready** **Signals from axis/spindle: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The signal is routed on the NCU in the NCU link group to which the axis is physically connected. Axis is ready.	
Signal state 0	Axis is not ready. This state will be set when the channel, the mode group or the NC have generated the alarm "Not ready".	
More information	• Function Manual SINUMERIK 828D basic functions	

Table 10-412 DB390x.DBX1.3, follow-up active

DB390x.DBX1.3	**Follow-up active** **Signals from axis/spindle: NC → PLC**
Edge evaluation: No	Signal updated: cyclic
Signal state 1	The controller signals that the follow-up mode for the axis/spindle is active. Requirements for this are: • The controller enable signal for the drive is removed. Either by the PLC with the "Controller enable signal " = 0 signal or in the control when faults occur; see "More information". • Follow-up mode is selected. Either by the PLC with the "Follow-up operation" = 1 signal or in the control, e.g. when canceling the controller enable signal of an axis that is traversing. The position setpoint continually tracks the actual value while the follow-up mode is active. The standstill and clamping monitoring are not active.
Signal state 0	The control signals that follow-up mode for the axis/spindle is not active. The standstill and clamping monitoring are active. This means that the requirements specified above are not fulfilled. In the "Hold" state, the "Follow-up mode active" signal = 0.
Special cases, errors, etc.	Notice: A delete distance-to-go is triggered internally in the control at the transition from "Follow-up" to "Hold" ("Follow-up mode" signal = 0) or in closed-loop control mode ("Controller enable" signal = 1).
See also	Table 10-350 DB380x.DBX2.1, controller enable (Page 322) Table 10-347 DB380x.DBX1.4, follow-up mode (Page 319)
More information	• Function Manual SINUMERIK 828D Basic Functions • Diagnostics Manual SINUMERIK 828D SINAMICS S120 Alarms

Table 10-413 DB390x.DBX1.4, axis/spindle stationary (n < nmin)

DB390x.DBX1.4	**Axis/spindle stationary ($n < n_{min}$)** **Signals from axis/spindle: NC → PLC**
Edge evaluation: No	Signal updated: cyclic
Signal state 1	The current velocity of the axis or the actual speed of the spindle lies below the limit defined using MD36060 $MA_STANDSTILL_VELO_TOL.
Signal state 0	The actual velocity of the axis or the actual spindle speed is greater than the value specified in MD36060 (standstill/zero speed range). If a travel command is present, e.g. for a spindle, the signal is always = 0, even if the actual speed lies below that specified in MD36060. If the "Axis/spindle stationary" signal is signaled and there is no position control active for the spindle, then an actual speed of zero is displayed at the operator interface and zero is read with the system variable $AA_S[n].
Application	• Enable for opening a protective device (e.g. "Open door"). • The workpiece chuck or the tool clamping device is only opened when the spindle is stationary. • The oscillation mode can be switched-on during gear stage change after the spindle has been braked down to standstill. • The tool clamping device must have been closed before the spindle can be accelerated.

DB390x.DBX1.4	**Axis/spindle stationary ($n < n_{min}$)** **Signals from axis/spindle: NC → PLC**
See also	MD36060 $MA_STANDSTILL_VELO_TOL: Maximum velocity/speed for the "Axis/spindle stationary" signal.
More information	• Function Manual SINUMERIK 828D Axes and Spindles

Table 10-414 DB390x.DBX1.5, position controller active

DB390x.DBX1.5	**Position controller active** **Signals from axis/spindle: NC → PLC**
Edge evaluation: No	Signal updated: cyclic
Signal state 1	The control signals that the position controller is closed.
Signal state 0	The control signals that the position controller is open. If the "Controller enable" is canceled because of a fault or from the PLC user program, the position controller is opened and therefore the "Position controller active" interface signal set to 0. Spindle without position control: Signal "Position controller active" is always "0".
Application	• The "Position controller active" signal can be used as feedback for the "Controller enable" signal. • The holding brake of a vertical axis must be activated as soon as the position control is no longer active. • If a spindle has been technically dimensioned for the purpose, it can be changed-over in position control mode as a spindle or an axis in the part program (with `SPCON` or `M70`). In these cases, the "position controller active" interface signal is set.
Special cases, errors, etc.	The "Position controller active" signal is also set for simulation axes as soon as MD30350 $MA_SIMU_AX_VDI_OUTPUT = 1.
See also	Table 10-350 DB380x.DBX2.1, controller enable (Page 322) Table 10-348 DB380x.DBX1.5 and .6, position measuring system 1 (PMS1) / position measuring system 2 (PMS2) (Page 320) MD30350 $MA_SIMU_AX_VDI_OUTPUT: Output of axis signals for simulation axes
More information	• Function Manual SINUMERIK 828D Axes and Spindles

Table 10-415 DB390x.DBX1.6, speed controller active

DB390x.DBX1.6	**Speed controller active** **Signals from axis/spindle: NC → PLC**
Edge evaluation: No	Signal updated: cyclic
Signal state 1	The control signals that the speed controller is closed.
Signal state 0	The control signals that the speed controller is open. The speed controller output is cleared.
Application	For spindles without closed-loop position control, the interface signal can be used as feedback for the "Controller enable" signal.
Special cases, errors, etc.	The "Speed controller active" signal is also set for simulation axes, as soon as MD30350 = 1.
See also	Table 10-350 DB380x.DBX2.1, controller enable (Page 322) Table 10-348 DB380x.DBX1.5 and .6, position measuring system 1 (PMS1) / position measuring system 2 (PMS2) (Page 320) MD30350 $MA_SIMU_AX_VDI_OUTPUT: Output of axis signals for simulation axes
More information	• Function Manual SINUMERIK 828D basic functions

Table 10-416 DB390x.DBX1.7, current controller active

DB390x.DBX1.7	**Current controller active** **Signals from axis/spindle: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The control signals that the current controller is closed.	
Signal state 0	The control signals that the current controller is open. The current controller output (including the feedforward quantities on the manipulated variable for the voltage) is cleared.	
Application	For spindles without closed-loop position control, the interface signal can be used as feedback for the "Controller enable" signal.	
See also	Table 10-414 DB390x.DBX1.5, position controller active (Page 358) Table 10-415 DB390x.DBX1.6, speed controller active (Page 358)	
More information	• Function Manual SINUMERIK 828D Axes and Spindles	

Table 10-417 DB390x.DBX2.1, handwheel override active

DB390x.DBX2.1	**Handwheel override active** **Signals from axis/spindle: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The "Handwheel override in AUTOMATIC mode" function is active for the programmed positioning axis (`FDA[AXi]`). Handwheel pulses for this axis affect the programmed axis feedrate either as path definition (for `FDA` = 0) or as velocity override (for `FDA` > 0).	
Signal state 0	The "Handwheel override in AUTOMATIC mode" function is not active for the programmed positioning axis (or concurrent positioning axis). An active handwheel override becomes inactive when the following occurs: • The positioning axis has reached the programmed target position • The distance-to-go is deleted by the channel-specific "Delete distance-to-go" signal. • A reset is performed.	
More information	• Function Manual SINUMERIK 828D Axes and Spindles	

Table 10-418 DB390x.DBX2.2, revolutional feedrate active

DB390x.DBX2.2	**Revolutional feedrate active** **Signals from axis/spindle: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	When programming `G95` (revolutional feedrate) in JOG mode or automatic mode.	
See also	SD41100 $SN_JOG_REV_IS_ACTIVE: Revolutional feedrate in JOG mode active. SD42600 $SC_JOG_FEED_PER_REV_SOURCE: In JOG mode, revolutional feedrate for geometry axes on which a frame with rotation is effective. SD43300 $SA_ASSIGN_FEED_PER_REV_SOURCE: Revolutional feedrate for positioning axes / spindles. MD32040 $MA_JOG_REV_VELO_RAPID: Revolutional feedrate in JOG mode with rapid traverse override. MD32050 $MA_JOG_REV_VELO: Revolutional feedrate in JOG mode.	
More information	• Function Manual SINUMERIK 828D Axes and Spindles	

Table 10-419 DB390x.DBX2.3, measurement active

DB390x.DBX2.3	**Measurement active** **Signals from axis/spindle: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The "Measuring" function is active. The instantaneous measurement status of the axis is displayed (measuring set with this axis is running).	
Signal state 0	The "Measuring" function is not active.	

Table 10-420 DB390x.DBX2.4, activate travel to fixed stop

DB390x.DBX2.4	**Activate travel to fixed stop** **Signals from axis/spindle: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The "Travel to fixed stop" function is active.	
Signal state 0	The "Travel to fixed stop" function is not active.	
More information	• Function Manual SINUMERIK 828D Axes and Spindles	

Table 10-421 DB390x.DBX2.5, fixed stop reached

DB390x.DBX2.5	**Fixed stop reached** **Signals from axis/spindle: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The fixed stop was reached after selecting the `FXS` function.	
Signal state 0	The fixed stop has still not been reached after selecting the `FXS` function.	
More information	• Function Manual SINUMERIK 828D Axes and Spindles	

DB39xx.DBX3.0, reset executed

Table 10-422 DB39xx.DBX3.0, reset executed

DB39xx.DBX3.0	**Reset executed** **Signals from axis/spindle: NC → PLC**
Update	cyclic
Signal state 1	The PLC-controlled axis is in the reset state.
Signal state 0	The PLC-controlled axis is **not** in the reset state.
Description	Reset status: • The machine data of the axis is reloaded. • The axis status is at "Single axis in reset": $AA_SNGLAX_STAT == 1 • DB39xx.DBX3.2 (axis stop active) == 0
Corresponds with	DB38xx.DBX5004.1 (PC-controlled axis: Reset) DB39xx.DBX3.2 (axis stop active) System variable: $AA_SNGLAX_STAT (status of the single axis) OPI variable: aaSnglAxStat
More information	• Function Manual SINUMERIK 828D Axes and Spindles

DB39xx.DBX3.1, PC controls axis

Table 10-423 DB39xx.DBX3.1, PC controls axis

DB39xx.DBX3.1	PLC-controlled axis Signals from axis/spindle: NC → PLC
Update	cyclic
Signal state 1	Axis control is transferred to the PLC.
Signal state 0	The axis is controlled by the NC.
Corresponds with	DB38xx.DBX5004.7 (request PC controls axis) System variable: $AA_SNGLAX_STAT (status of the single axis)
More information	• Function Manual SINUMERIK 828D Axes and Spindles

DB39xx.DBX3.2, axis stop active

Table 10-424 DB39xx.DBX3.2, axis stop active

DB39xx.DBX3.2	Axis stop active Signals from axis/spindle: NC → PLC
Update	cyclic
Signal state 1	The PLC-controlled axis is stopped as a result of DB39xx.DBX5004.6 = 1.
Signal state 0	The PLC-controlled axis is stopped.
Description	After stopping, the axis is in the "Single axis is interrupted" status. $AA_SNGLAX_STAT == 3
Corresponds with	DB39xx.DBX5004.6 (PC-controlled axis: Stop along braking ramp) DB39xx.DBX5004.7 (PC controls axis) DB39xx.DBX0.6 (position reached with exact stop coarse) DB39xx.DBX0.7 (position reached with exact stop fine) System variable: $AA_SNGLAX_STAT (status of the single axis) OPI variable: aaSnglAxStat
More information	• Function Manual SINUMERIK 828D Axes and Spindles

DB39xx.DBX3.3, axis/spindle disable active

Table 10-425 DB39xx.DBX3.3, axis/spindle disable active

DB39xx.DBX3.3	Axis/spindle disable active Signals from axis/spindle: NC → PLC
Update	cyclic
Signal state 1	Axis/spindle disable is active.
Signal state 0	The axis/spindle disable is **not** active.
Description	An axis/spindle disable is requested via DB38, ... DBX1.3 = 1

DB39xx.DBX3.3	**Axis/spindle disable active** **Signals from axis/spindle: NC → PLC**
Corresponds with	DB38xx.DBX1.3 (axis/spindle disable) DB38xx.DBX1002.1 (activate program test) DB320x.DBX1.7 (activate program test) DB330x.DBX1.7 (program test active)
More information	• Function Manual SINUMERIK 828D Axes and Spindles

Table 10-426 DB390x.DBX4.0 to .2, handwheel 1/2/3 active

DB390x.DBX4.0 **DB390x.DBX4.1** **DB390x.DBX4.2**	**Handwheel 1 active** **Handwheel 2 active** **Handwheel 3 active** **Signals from axis/spindle: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	Message as to whether this machine axis is assigned to handwheel 1/2/3 or no handwheel. Only one handwheel can be assigned to an axis at any one time. If several "Activate handwheel" interface signals are set, then 'Handwheel 1' has a higher priority than 'Handwheel 2' before 'Handwheel 3'. If the assignment is active, then the machine axis can be traversed using the handwheel in JOG mode.	
Signal state 0	Neither handwheel 1, 2 nor 3 is assigned to this machine axis.	
See also	Table 10-357 DB380x.DBX4.0 to .2, activate handwheel 1/2/3 (Page 327) Table 10-162 DB1900.DBX1003.6 to 1005.6, handwheel selected for handwheel 1/2/3 (Page 232)	
More information	• Function Manual SINUMERIK 828D Axes and Spindles	

Table 10-427 DB390x.DBX4.5 and .4, plus/minus travel request

DB390x.DBX4.5 **DB390x.DBX4.4**	**Plus travel request** **Minus travel request** **Signals from axis/spindle: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	A traversing motion is to be performed in the relevant axis direction. Depending on the mode selected, the travel command is triggered in different ways. • JOG mode: With the plus or minus traversing key. • REF mode: With the traversing key that takes the axis to the reference point. • AUTO/MDI mode: A program block containing a coordinate value for the relevant axis is executed.	

DB390x.DBX4.5 DB390x.DBX4.4	**Plus travel request** **Minus travel request** **Signals from axis/spindle: NC → PLC**
Signal state 0	There is no travel request in the relevant axis direction or a traversing motion has been completed. • JOG mode: The travel command is reset depending on the "Jog or continuous mode" setting. • REF mode: When the reference point is reached. • AUTO/MDI mode: The program block has been executed (and the next block does not contain any coordinate values for the relevant axis). • Cancel using reset, etc. • "Axis/spindle disable" signal is active.
Application	Releasing the clamping for axes with clamping (e.g. for rotary tables). Note: If the clamping is not released until the travel command is issued, these axes cannot be operated in path mode!
See also	Table 10-346 DB380x.DBX1.3, axis/spindle disable (Page 318) Table 10-361 DB380x.DBX4.7 and .6, plus and minus traversing keys for axes in the WCS (Page 330) Table 10-428 DB390x.DBX4.7 and .6, plus/minus travel command (Page 363)
More information	• Function Manual SINUMERIK 828D Axes and Spindles

Table 10-428 DB390x.DBX4.7 and .6, plus/minus travel command

DB3900.DBX4.7 DB3900.DBX4.6	**Travel command plus** **Minus travel command** **Signals from axis/spindle: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	A traversing motion is to be performed in the relevant axis direction. Depending on the mode selected, the travel command is triggered in different ways. • JOG mode: With the plus or minus traversing key. • REF mode: With the traversing key that takes the axis to the reference point. • AUTO/MDI mode: A program block containing a coordinate value for the relevant axis is executed.	

DB3900.DBX4.7 **DB3900.DBX4.6**	**Travel command plus** **Minus travel command** **Signals from axis/spindle: NC → PLC**
Signal state 0	There is no travel request in the relevant axis direction or a traversing motion has been completed. • JOG mode: – When withdrawing the traversing key – When ending traversing with the handwheel • REF mode: When the reference point is reached • AUTO/MDI mode: – The program block has been executed and the next block does not contain any co-ordinate values for the relevant axis – Cancel using reset, etc. – "Axis disable" signal is present
Application	Releasing the clamping for axes with clamping, e. g. for rotary tables. Note: If the clamping is not released until the travel command is given, these axes cannot be operated in path mode!
See also	Table 10-361 DB380x.DBX4.7 and .6, plus and minus traversing keys for axes in the WCS (Page 330)
More information	• Function Manual SINUMERIK 828D Axes and Spindles

Table 10-429 DB390x.DBX5.0 to .6, machine functions INC1 ... continuous

DB3900.DBX5.0 to .6	**Active machine functions INC1, INC10, INC100, INC1000, INC10000, INCvar, continuous** **Signals from axis/spindle: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	Feedback, which machine function is active for the geometry axes in JOG mode.	
Signal state 0	The relevant machine function is not active.	
See also	Table 10-362 DB380x.DBX5.0 to .6, machine functions INC1 ... INCvar (Page 330)	
More information	• Function Manual SINUMERIK 828D Axes and Spindles	

DB39xx.DBX7.0, invert handwheel direction of rotation

Table 10-430 DB39xx.DBX7.0, handwheel direction of rotation inversion active

DB39xx.DBX7.0	**Handwheel direction of rotation inversion active** **Signals from axis/spindle: NC → PLC**
Update	cyclic
Signal state 1	The inversion of the direction of rotation of the handwheel assigned to the machine axis is active.
Signal state 0	The inversion of the direction of rotation of the handwheel assigned to the machine axis is **not** active.
Corresponds with	DB38xx.DBX7.0 (invert handwheel direction of rotation)
More information	• Function Manual SINUMERIK 828D Axes and Spindles

Table 10-431 DB390x.DBB8, axis/spindle replacement

DB390x.DBB8	**Axis/spindle replacement** **Signals from axis/spindle: NC → PLC**	
Edge evaluation: Yes	Signal updated: cyclic	
Edge change 0 → 1	Bit 0:	A → Current assignment of the NC axis/spindle in the channel
	Bit 1:	B → Current assignment of the NC axis/spindle in the channel
	Bit 2:	-
	Bit 3:	-
	Bit 4:	New type requested from PLC
	Bit 5:	Axis replacement possible
	Bit 6:	Neutral axis/spindle
	Bit 7:	PLC axis/spindle
Edge change 1 → 0		
See also	Table 10-363 DB380x.DBB8, axis/spindle replacement (Page 331) MD20070 $MC_AXCONF_MACHAX_USED: Machine axis number valid in channel MD30550 $MA_AXCONF_ASSIGN_MASTER_CHAN: Reset position of channel for the axis replacement	
More information	• Function Manual SINUMERIK 828D basic functions	

DB39xx.DBX9.0 to .2, parameter set servo

Table 10-432 DB39xx.DBX9.0 to .2, active position controller parameter set

DB39xx.DBX9.0 to .2	**Active position controller parameter set** **Signals from axis/spindle: NC → PLC**			
Update	Job-controlled			
More information	**Bit 2**	**Bit 1**	**Bit 0**	**Parameter set**
	0	0	0	1
	0	0	1	2
	0	1	0	3
	0	1	1	4
	1	0	0	5
	1	0	1	6
	1	1	0	6
	1	1	1	6
	Note The interface is irrelevant when the switchover is deactivated MD35590 $MA_PARAMSET_CHANGE_ENABLE == 0 In this case, the 1st parameter set is always active.			
Corresponds with	DB38, ...DBX9.0 - DBX9.2 (selection: position controller parameter set)			

DB39xx.DBX11.4, position restored, measuring system 1

Table 10-433 DB39xx.DBX11.4, position restored, measuring system 1

DB39xx.DBX11.4	**Position restored, measuring system 1** **Signals from axis/spindle: NC → PLC**
Update	cyclic
Signal state 1	The position of measuring system 1 of the machine axis is restored.
Signal state 0	The position of measuring system 1 of the machine axis is **not** restored.
Description	MD34210 $MA_ENC_REFP_STATE == 3 After the control system has powered up, for distance-coded, incremental measuring systems the last axis position buffered before switch off is restored. Referencing does not take place automatically. The position measuring system is in the "position restored" state.
Corresponds with	DB39xx.DBX11.5 (position restored, measuring system 2) MD34102 $MA_REFP_SYNC_ENCS (measuring system calibration) MD34210 $MA_ENC_REFP_STATE (adjustment status absolute encoder)
More information	• Function Manual SINUMERIK 828D Axes and Spindles

DB39xx.DBX11.5, position restored, measuring system 2

Table 10-434 DB39xx.DBX11.5, position restored, measuring system 2

DB39xx.DBX11.5	Position restored, measuring system 2 Signals from axis/spindle: NC → PLC
Update	cyclic
Signal state 1	The position of measuring system 2 of the machine axis is restored.
Signal state 0	The position of measuring system 2 of the machine axis is **not** restored.
Description	MD34210 $MA_ENC_REFP_STATE == 3 After the control system has powered up, for distance-coded, incremental measuring systems the last axis position buffered before switch off is restored. Referencing does not take place automatically. The position measuring system is in the "position restored" state.
Corresponds with	DB39xx.DBX11.4 (position restored, measuring system 1) MD34102 $MA_REFP_SYNC_ENCS (measuring system calibration) MD34210 $MA_ENC_REFP_STATE (adjustment status absolute encoder)
More information	• Function Manual SINUMERIK 828D Axes and Spindles

Signals from axis

DB39xx.DBX1000.4, modulo limit enabled

Table 10-435 DB39xx.DBX1000.4, modulo rotary axis: traversing range limits active

DB39xx.DBX1000.4	Modulo rotary axis: traversing range limits active Signals from axis/spindle: NC → PLC
Update	cyclic
Signal state 1	Traversing range limits (software limit switch, working area limits) active for modulo rotary axes.
Signal state 0	Traversing range limitation for modulo rotary axes **not** active.
Description	**Note** The signal is irrelevant if linear axes/rotary axes do not have modulo functionality. **Application example** Mounted rotary axis with monitoring
Corresponds with	DB38xx.DBX1000.4 (modulo rotary axis: activate traversing range limits)
More information	• Function Manual SINUMERIK 828D Axes and Spindles

DB39xx.DBX1001.0 to .2, JOG fixed-point approach active

Table 10-436 DB39xx.DBX1001.0 to .2

DB39xx.DBX1001.0 to .2	**JOG approach fixed point active** **Signals from axis/spindle: NC → PLC**			
Update	cyclic			
Description	As soon as the "Approach fixed point in JOG" function is active, the number of the fixed point to be approached is signaled back to the PLC binary-coded using DB38, ... DBX75.0 - 2:			
	Bit 2	**Bit 1**	**Bit 0**	**Number of fixed point to be approached**
	0	0	0	-
	0	0	1	1
	0	1	0	2
	0	1	1	3
	1	0	0	4
	The selected machine axis can be traversed to the corresponding fixed point with the traversing keys or the handwheel. The fixed points are defined using machine data MD30600.			
Corresponds with	DB38xx.DBX1001.0 to .2 (JOG fixed-point approach) DB39xx.DBX1001.3 to .5 (JOG fixed-point approach reached) MD30600 $MA_FIX_POINT_POS[<n>] (fixed value positions of the axis)			
More information	• Function Manual SINUMERIK 828D Axes and Spindles			

DB39xx.DBX1001.3 to .5, JOG fixed-point approach reached

Table 10-437 DB39xx.DBX1001.3 to .5, JOG fixed-point approach reached

DB39xx.DBX1001.3 to .5	**JOG approach fixed point reached** **Signals from axis/spindle: NC → PLC**			
Update	cyclic			
Description	Once the axis for "Approach fixed point in JOG" has reached the fixed point position with "Exact stop fine", using DB38, ... DBX75.3 - 5 the number of the approached fixed point is signaled back to the PLC in binary-coded form:			
	Bit 2	**Bit 1**	**Bit 0**	**Number of the approached fixed point**
	0	0	0	-
	0	0	1	1
	0	1	0	2
	0	1	1	3
	1	0	0	4
	This feedback signal is also issued if the axis reaches the fixed point position in the machine coordinates system via other methods e.g. NC program, FC18 (for 840D sl) or synchronized action on the setpoint side and comes to a standstill on the actual value side within the "Exact stop fine" tolerance window.			

DB39xx.DBX1001.3 to .5	JOG approach fixed point reached Signals from axis/spindle: NC → PLC
Corresponds with	DB38xx.DBX1001.0 to .2 (JOG fixed-point approach) DB39xx.DBX1001.0 to .2 (JOG fixed-point approach active) MD30600 $MA_FIX_POINT_POS[<n>] (fixed value positions of the axis) MD36010 $MA_STOP_LIMIT_FINE (exact stop fine)
More information	Function Manual SINUMERIK 828D Axes and Spindles

DB39xx.DBX1001.6, jog to position active

Table 10-438 DB39xx.DBX1001.6, JOG travel to position active

DB39xx.DBX1001.6	JOG travel to position active Signals from axis/spindle: NC → PLC
Update	cyclic
Signal state 1	The function "Position travel in JOG" is active.
Signal state 0	The function "Position travel in JOG" is **not** active
Description	The selected machine axis can be traversed to the position specified with setting data SD43320 using the traversing keys or the handwheel.
Corresponds with	DB38xx.DBX1001.3 (JOG travel to position) DB39xx.DBX1001.7 (JOG position reached) SD43320 $SA_JOG_POSITION (JOG position)
More information	• Function Manual SINUMERIK 828D Axes and Spindles

DB39xx.DBX1001.7, JOG position reached

Table 10-439 DB39xx.DBX1001.7, JOG position reached

DB39xx.DBX1001.7	JOG position reached Signals from axis/spindle: NC → PLC
Update	cyclic
Signal state 1	For "Position travel in JOG", the axis has reached the position specified with SD43320 with "Exact stop fine".
Signal state 0	For "Position travel in JOG", the axis has still **not** reached the position specified with SD43320.
Description	Approaching the position is started with the traversing keys or the handwheel. The axis traverses until it comes to an automatic standstill at the position to be approached.
Corresponds with	DB38xx.DBX1001.3 (JOG travel to position) DB39xx.DBX1001.6 (JOG travel to position active) SD43320 $SA_JOG_POSITION (JOG position)
More information	• Function Manual SINUMERIK 828D Axes and Spindles

Table 10-440 DB390x.DBX1002.0, lubrication pulse

DB390x.DBB1002.0	**Lubrication pulse** **Signals from axis: NC → PLC**	
Edge evaluation: Yes	Signal updated: cyclic	
Edge change 0 → 1	As soon as the axis/spindle has traversed the distance set in MD33050, the "Lubrication pulse" interface signal is inverted and lubrication is started. The distance measurement is restarted each time the control runs up.	
Edge change 1 → 0		
Application	The lubricant pump of the axis/spindle can be controlled. Machine bed lubrication therefore depends on the distance traveled.	
See also	MD33050 $MA_LUBRICATION_DIST: Traversing distance for lubrication from the PLC	
More information	• Function Manual SINUMERIK 828D basic functions	

Table 10-441 DB390x.DBB1002.4, path axis

DB390x.DBB1002.4	**Path axis** **Signals from axis/spindle: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The axis is involved in the path.	
Signal state 0	The axis is not involved in the path.	
More information	• Function Manual SINUMERIK 828D basic functions	

Table 10-442 DB390x.DBX1002.5, positioning axis

DB390x.DBB1002.5	**Positioning axis** **Signals from axis: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The NC treats the axis as a positioning axis. It therefore has: • Its own axis interpolator (linear interpolator) • Its own feedrate (F value) • Its own feedrate override	
Signal state 0	The axis is not a positioning axis.	
More information	• Function Manual SINUMERIK 828D Axes and Spindles	

Table 10-443 DB390x.DBX1002.6, indexing axis in position

DB390x.DBB1002.6	**Indexing axis in position** **Signals from axis: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The signal is dependent on "Exact stop fine": The signal is set if "Exact stop fine" is reached. The signal is reset when exiting "Exact stop fine". The indexing axis is located on an indexing position. The indexing axis has been positioned with instructions for "Coded position".	

DB390x.DBB1002.6	**Indexing axis in position** **Signals from axis: NC → PLC**
Signal state 0	The axis is not defined as an indexing axis. The indexing axis travels: "Plus/minus travel command" signal is active. The indexing axis is located at a position which is not an indexing position, e.g.: In JOG mode, after abort of the traversing motion, e.g. with reset. In Automatic mode: The indexing axis has, for example, approached an arbitrary position controlled by an AC or DC instruction. The indexing axis has not been positioned with instructions for "Coded position" (`CAC`, `CACP`, `CACN`, `CDC`, `CIC`) in automatic mode. The "Controller enable" of the indexing axis is removed: "Controller enable" signal
Application	Tool magazine: Activation of the gripper to remove the tool from the magazine is initiated as soon as the indexing axis is in position. The PLC user program must ensure this happens.
Special cases, errors, etc.	The axis positions entered in the indexing position table for the individual divisions can be changed using work offsets (including DRF). If a DRF offset is applied to an indexing axis in AUTOMATIC mode, then the "Indexing axis in position" interface signal remains active even though the axis is no longer at an indexing position.
See also	MD30500 $MA_INDEX_AX_ASSIGN_POS_TAB: Axis is indexing axis
More information	• Function Manual SINUMERIK 828D Axes and Spindles

Table 10-444 DB390x.DBX1003.0, collision avoidance: Velocity reduction

DB3900.DBX1003.0	**Collision avoidance: Velocity reduction** **Signals from NC channel: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The traversing velocity of the axis is reduced by the collision avoidance.	
Signal state 0	The traversing velocity of the axis is **not** reduced by the collision avoidance.	
More information	• Function Manual SINUMERIK 828D monitoring and compensating	

Signals from spindle

Table 10-445 DB390x.DBX2000.0 to .2, set gear stage A to C

DB390x.DBX2000.0 **DB390x.DBX2000.1** **DB390x.DBX2000.2**	**Set gear stage A** **Set gear stage B** **Set gear stage C** **Signals from axis/spindle: NC → PLC**	
Edge evaluation: Yes	Signal updated: cyclic	
Edge change 0 → 1	A gear stage can be specified as follows: • Permanently using the part program (M41 to M45) • Automatically using the programmed spindle speed (M40) M41 to M45: The gear stage can be permanently specified in the part program with M41 to M45. If a gear stage is specified using M41 to M45 which is not the same as the current (actual) gear stage, then the "Change gear stage" signal and the "Set gear stage A to C" signal are set. M40: The control automatically defines the gear stage with M40 in the part program. The control checks which gear stage is possible for the programmed spindle speed (S function). If a gear stage is found that is not the same as the current (actual) gear stage, then the "Change gear stage" signal and the "Set gear stage" A" to C" signal are set. The set gear stage is output in coded format:	
	1st gear stage	0 0 0 (C B A)
	1st gear stage	0 0 1
	2nd gear stage	0 1 0
	3rd gear stage	0 1 1
	4th gear stage	1 0 0
	5th gear stage	1 0 1
	Invalid value	1 1 0
	Invalid value	1 1 1
Signal irrelevant for ...	other spindle modes except oscillation mode.	
See also	Table 10-446 DB390x.DBX2000.3, change gear stage (Page 373) Table 10-372 DB380x.DBX2000.0 to .2, actual gear stage A to C (Page 336) Table 10-373 DB380x.DBX2000.3, gear is changed over (Page 336)	
More information	• Function Manual SINUMERIK 828D Axes and Spindles	

Table 10-446 DB390x.DBX2000.3, change gear stage

DB390x.DBX2000.3	**Change gear** **Signals from spindle: NC → PLC**	
Edge evaluation: Yes	Signal updated: cyclic	
Edge change 0 → 1	A gear stage can be specified as follows: • Permanently using the part program (`M41` to `M45`) • Automatically using the programmed spindle speed (`M40`) `M41` to `M45`: The gear stage can be permanently specified in the part program with `M41` to `M45`. If a gear stage is specified using `M41` to `M45` which is not the same as the current (actual) gear stage, then the "Change gear stage" signal and the "Set gear stage A to C" signal are set. `M40`: The control automatically defines the gear stage with `M40` in the part program. The control checks which gear stage is possible for the programmed spindle speed (S function). If a gear stage is found that is not the same as the current (actual) gear stage, then the "Change gear stage" signal and the "Set gear stage" A" to C" signal are set. While the signal = 1, the text "Wait for gear stage change" is displayed in the channel operating message.	
Special cases, errors, etc.	The "Change gear stage" signal is only enabled when a new gear stage is selected that is not the same as the current gear stage.	
See also	Table 10-445 DB390x.DBX2000.0 to .2, set gear stage A to C (Page 372) Table 10-372 DB380x.DBX2000.0 to .2, actual gear stage A to C (Page 336) Table 10-373 DB380x.DBX2000.3, gear is changed over (Page 336)	
More information	• Function Manual SINUMERIK 828D Axes and Spindles	

Table 10-447 DB390x.DBX2001.0, speed limit exceeded

DB390x.DBX2001.0	**Speed limit exceeded** **Signals from axis/spindle: NC → PLC**	
Edge evaluation: Yes	Signal updated: cyclic	
Edge change 0 → 1	If the actual speed exceeds the max. spindle speed MD35100 by more than the spindle speed tolerance MD35150, the "Speed limit exceeded" signal is set and alarm 22050 "Maximum speed reached" is output. All axes and spindles of the channel are braked.	
See also	MD35150 $MA_SPIND_DES_VELO_TOL: Spindle speed tolerance MD35100 $MA_SPIND_VELO_LIMIT: Maximum spindle speed Alarm 22050 "Maximum speed reached"	
More information	• Function Manual SINUMERIK 828D Axes and Spindles	

Table 10-448 DB390x.DBX2001.1, speed setpoint limited (programmed speed too high)

DB390x.DBX2001.1	**Speed setpoint limited (programmed speed too high)** **Signals from axis/spindle: NC → PLC**	
Edge evaluation: Yes	Signal updated: cyclic	
Edge change 0 → 1	If a spindle speed (r/min) or a constant cutting speed (m/min or ft/min) is programmed, one of the following limits has been exceeded: • Maximum speed of the specified gear stage • Maximum spindle speed • Speed limiting by the PLC • Programmed spindle speed limitation G25 • Programmed spindle speed limitation for G96 The spindle speed is limited to the maximum limit value.	
Edge change 1 → 0	If a spindle speed (r/min) or a constant cutting speed (m/min or ft/min) is programmed, no limit values were exceeded.	
Application	This signal can be used to detect that the programmed speed cannot be reached. The PLC user can identify this state as not permissible and disable the path velocity, or the complete channel. With the "Spindle in setpoint range" signal, processing is performed.	
More information	• Function Manual SINUMERIK 828D Axes and Spindles	

Table 10-449 DB390x.DBX2001.2, speed setpoint limited (programmed speed too low)

DB390x.DBX2001.2	**Speed setpoint increased (programmed speed too low)** **Signals from axis/spindle: NC → PLC**	
Edge evaluation: Yes	Signal updated: cyclic	
Edge change 0 → 1	The effective setpoint speed is below the current min. limit value. The setpoint speed is limited to this limit. Limit values: • MD35120 $MA_GEAR_STEP_MIN_VELO: Minimum speed for automatic gear stage selection M40 • MD35140 $MA_GEAR_STEP_MIN_VELO_LIMIT: Minimum speed of the gear stage • G25 lower spindle speed limitation	
Edge change 1 → 0	The speed setpoint of the spindle is outside the minimum limit value.	
Application	The speed setpoint of the spindle is not reached. Possible responses: • Accept the state as permissible and enable the path velocity: "Feedrate inhibit" signal = 0 • Disable the path velocity or the entire channel: "Feedrate inhibit" signal = 1, "Spindle in setpoint range" signal is processed. The interface signal indicates that the programmed speed setpoint cannot be reached. The feedrate can be enabled nonetheless via the PLC user program. The PLC user can accept this state as permissible and enable the path velocity, or can disable the path velocity or the entire channel.	
See also	Table 10-242 DB3200.DBX6.0, feed disable (Page 269) Table 10-358 DB380x.DBX4.3, feed stop / spindle stop (axis-specific) (Page 328) Table 10-451 DB390x.DBX2001.5, spindle in setpoint range (Page 375)	
More information	• Function Manual SINUMERIK 828D Axes and Spindles	

Table 10-450 DB390x.DBX2001.3, geometry monitoring

DB390x.DBX2001.3	**Geometry monitoring** **Signals from axis/spindle: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	Error in grinding wheel geometry. There is no further response when this monitoring function responds. Required responses must be programmed by the PLC user.	
Signal state 0	No error in the grinding wheel geometry.	
Application	Grinding-specific tool monitoring.	
More information	• Function Manual SINUMERIK 828D Tools	

Table 10-451 DB390x.DBX2001.5, spindle in setpoint range

DB390x.DBX2001.5	**Spindle in setpoint range** **Signals from axis/spindle: NC → PLC**	
Edge evaluation: Yes	Signal updated: cyclic	
Edge change 0 → 1	Signals whether the programmed and, if required, limited spindle speed has been reached. In the spindle control mode, the speed setpoint (programmed speed * spindle override including limits) is compared with the actual speed. If the actual speed deviates from the setpoint speed by less than the spindle speed tolerance MD35150, then the "Spindle in setpoint range" signal is set.	
Edge change 1 → 0	Signals whether the spindle is still in the acceleration or deceleration phase. In the spindle control mode, the speed setpoint (programmed speed * spindle override including limits) is compared with the actual speed. If the actual speed deviates from the setpoint speed by more than the spindle speed tolerance MD35150, then the "Spindle in setpoint range" signal is reset.	
Signal irrelevant for ...	All spindle modes except for speed mode (control mode).	
Application	The path velocity must generally be disabled when the spindle is in the acceleration phase (programmed speed setpoint not yet reached). This can be done in the following way: The "Spindle in setpoint range" signal is evaluated and the "Feed disable" signal is set. MD35500 is set and the NC evaluates internally as to whether the spindle is in the setpoint range. The path velocity is only enabled if the spindle is within the setpoint range. Positioning axes are never stopped by this function.	
See also	MD35150 $MA_SPIND_DES_VELO_TOL: Spindle speed tolerance MD35500 $MA_SPIND_ON_SPEED_AT_IPO_START: Feed enable for spindle in the setpoint range.	
More information	• Function Manual SINUMERIK 828D Axes and Spindles	

Table 10-452 DB390x.DBX2001.6, speed monitoring

DB390x.DBX2001.6	**Speed monitoring** **Signals from axis/spindle: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	Error in grinding wheel geometry. There is no further response when this monitoring function responds. Required responses must be programmed by the PLC user.	

DB390x.DBX2001.6	**Speed monitoring** **Signals from axis/spindle: NC → PLC**
Signal state 0	No error in the grinding wheel geometry.
Application	Grinding-specific tool monitoring.
More information	• Function Manual SINUMERIK 828D Tools

Table 10-453 DB390x.DBX2001.7, actual direction or rotation clockwise

DB390x.DBX2001.7	**Actual direction of rotation clockwise** **Signals from axis/spindle: NC → PLC**	
Edge evaluation: Yes	Signal updated: cyclic	
Edge change 0 → 1	If the spindle is rotating, then the CLOCKWISE direction of rotation is signaled via the "Actual direction or rotation clockwise" signal = 1. The actual direction of rotation is derived from the spindle position encoder.	
Edge change 1 → 0	If the spindle is rotating, then the COUNTERCLOCKWISE direction of rotation is signaled via the "Actual direction or rotation clockwise" signal = 0.	
Signal irrelevant for ...	• Spindle stationary, "Axis/spindle stationary" signal = 1(at standstill it is not possible to evaluate a direction of rotation) • Spindles without position encoder	
See also	Table 10-413 DB390x.DBX1.4, axis/spindle stationary (n < nmin) (Page 357)	
More information	• Function Manual SINUMERIK 828D Axes and Spindles	

Table 10-454 DB390x.DBX2002.0, constant cutting rate active

DB390x.DBX2002.0	**Constant cutting rate active** **Signals from axis/spindle: NC → PLC**	
Edge evaluation: Yes	Signal updated: cyclic	
Edge change 0 → 1	When programming G96 S..., the constant cutting rate function is executed. The S word is now valid as cutting value.	
More information	• Function Manual SINUMERIK 828D Axes and Spindles	

Table 10-455 DB390x.DBX2002.1, GWPS active

DB390x.DBX2002.1	**GWPS active** **Signals from axis/spindle: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	Constant grinding wheel peripheral speed (GWPS) is active. If GWPS is active, then all S value inputs from the PLC are interpreted as the grinding wheel peripheral speed.	
Signal state 0	Constant grinding wheel peripheral speed (GWPS) is not active.	
Application	GWPS in all modes.	
More information	• Function Manual SINUMERIK 828D Tools	

Table 10-456 DB390x.DBX2002.3, tapping without compensating chuck active

DB390x.DBX2002.3	**Tapping without compensating chuck active** **Signals from axis/spindle: NC → PLC**	
Edge evaluation: Yes	Signal updated: cyclic	
Edge change 0 → 1	The spindle runs in the "Tapping without compensating chuck" function (thread interpolation G331/G332). In the case of tapping without compensating chuck, the spindle speed is also programmed at S... in rpm, but the direction of rotation is stored as a sign under the thread pitch. There is no response and/or update of all of the spindle-specific interface signals, for example: • "Spindle reset" signal • "Synchronize spindle" signal • "Invert M3/M4" signal • "Spindle in setpoint range" signal • "Programmed speed too high" signal	
Application	Certain functions should not be used during tapping without compensating chuck, such as: • "Reset controller enable" signal • "Set feed stop" signal • Reset • If the emergency stop is actuated during tapping without compensating chuck, then it should be taken into consideration that the tool and workpiece are keyed with one another.	
More information	• Function Manual SINUMERIK 828D Axes and Spindles	

Table 10-457 DB390x.DBX2002.4, active spindle mode, synchronous mode

DB390x.DBX2002.4	**Active spindle mode, synchronous mode** **Signals from axis/spindle: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The spindle is in synchronous mode. As a consequence, the following spindle follows the movements of the leading spindle corresponding to the gear ratio. In synchronous mode, the monitoring functions are active for coarse and fine synchronism. Note: The signal is set only for the machine axis which is active as following spindle, "FS active" signal = 1.	
Signal state 0	The spindle is not operated as a following spindle in synchronous mode. When switching off the coupling (deselection of synchronous mode), the following spindle is switched to control mode.	
See also	Table 10-487 DB390x.DBX5002.0, fine synchronism (Page 389) Table 10-488 DB390x.DBX5002.1, coarse synchronism (Page 390) Table 10-495 DB390x.DBX5003.1, FS (following spindle) active (Page 393)	
More information	• Function Manual SINUMERIK 828D Axes and Spindles	

Table 10-458 DB390x.DBX2002.5, active spindle mode, positioning mode

DB390x.DBX2002.5	**Active spindle mode, positioning mode** **Signals from axis/spindle: NC → PLC**	
Edge evaluation: Yes	Signal updated: cyclic	
Edge change 0 → 1	When programming `SPOS` =..., the spindle is in positioning mode.	
See also	Table 10-460 DB390x.DBX2002.7, active spindle mode, control mode (Page 378) Table 10-459 DB390x.DBX2002.6, active spindle mode, oscillation mode (Page 378)	
More information	• Function Manual SINUMERIK 828D Axes and Spindles	

Table 10-459 DB390x.DBX2002.6, active spindle mode, oscillation mode

DB390x.DBX2002.6	**Active spindle mode, oscillation mode** **Signals from axis/spindle: NC → PLC**	
Edge evaluation: Yes	Signal updated: cyclic	
Edge change 0 → 1	The spindle is in oscillation mode if a new gear stage was defined using automatic gear stage selection (`M40`) or `M41` to `M45`; "Change gear stage" signal is set. The "Change gear stage" signal is only enabled when a new gear stage is selected that is not the same as the current gear stage.	
See also	Table 10-460 DB390x.DBX2002.7, active spindle mode, control mode (Page 378) Table 10-458 DB390x.DBX2002.5, active spindle mode, positioning mode (Page 378) Table 10-446 DB390x.DBX2000.3, change gear stage (Page 373)	
More information	• Function Manual SINUMERIK 828D Axes and Spindles	

Table 10-460 DB390x.DBX2002.7, active spindle mode, control mode

DB390x.DBX2002.7	**Active spindle mode, control mode** **Signal from the axis/spindle: NC → PLC**	
Edge evaluation: Yes	Signal updated: cyclic	
Edge change 0 → 1	The spindle is in control mode with the following functions: Spindle direction of rotation specification `M3`/`M4` or spindle stop `M5` .	
See also	Table 10-459 DB390x.DBX2002.6, active spindle mode, oscillation mode (Page 378) Table 10-458 DB390x.DBX2002.5, active spindle mode, positioning mode (Page 378)	
More information	• Function Manual SINUMERIK 828D Axes and Spindles	

Table 10-461 DB390x.DBX2003.0 tool with dynamic response limitation

DB390x.DBX2003.0	**Tool with dynamic response limitation** **Signals from axis/spindle: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	After a tool change on the spindle, it is shown that a tool with dynamic response limitation is in the spindle. To do this, the PLC acknowledgments are evaluated. The assignment state of the spindles is checked, especially if all tools have a maximum tool speed, which may be very high so that there is no effective limiting.	
Signal state 0	The tool does not contain a parameterized dynamic response limitation.	

DB390x.DBX2003.0	Tool with dynamic response limitation Signals from axis/spindle: NC → PLC
See also	Option "Tool monitoring for maximum speed" Tool data TC_TP_MAX_VELO > 0 or TC_TP_MAX_ACC > 0
More information	• Function Manual SINUMERIK 828D Tool Management

Table 10-462 DB390x.DBX2003.5, spindle in position

DB390x.DBX2003.5	Spindle in position Signals from axis/spindle: NC → PLC	
Edge evaluation: Yes	Signal updated: cyclic	
Edge change 0 → 1	Requirement for the output of the "Spindle in position" signal is that the "Exact stop fine" is reached. Additionally, the last programmed spindle position must have been reached on the setpoint side. If the spindle is already at the programmed position after a positioning, then the "Spindle in position" signal remains set.	
Edge change 1 → 0	The "Spindle in position" signal is always reset when the "Exact stop fine" signal is removed.	
Application	The interface signal is processed exclusively with the Spindle positioning function. This includes: • SPOS, SPOSA and M19 in the part program • SPOS and M19 in synchronized actions Spindle in position for the tool change. If the tool change cycle is interrupted by the machine operator, e.g. with NC stop, NC stop axis plus spindle, mode stop etc., then the correct position to which the spindle is to travel in the tool changer can be queried via the "Spindle in position" signal.	
Special cases, errors, etc.	If the spindle is traversed after a positioning with already set "Spindle in position" signal, e.g. in JOG mode, then this signal is deleted. If the spindle returns to its original position in JOG mode, then the signal "Spindle in position" is set again. The last position specification is retained.	
See also	Table 10-408 DB390x.DBX0.7, position reached with exact stop fine (Page 355)	
More information	• Function Manual SINUMERIK 828D Axes and Spindles	

Signals from drive

DB39xx.DBX4000.1, ramp-function generator disable active

Table 10-463 DB39xx.DBX4000.1, ramp-function generator disable

DB39xx.DBX4000.1	Ramp-function generator disable Signals from axis/spindle: NC → PLC
Update	cyclic
Signal state 1	Ramp function generator fast stop is active for the axis drive.
Signal state 0	Ramp function generator fast stop is not active for the axis drive.
Corresponds with	DB38xx.DBX4000.1 (ramp-function generator quick stop)
More information	• Commissioning Manual SINUMERIK 828D Commissioning CNC

DB39xx.DBX4000.4, drive-autonomous motion active

Table 10-464 DB39xx.DBX4000.4, drive-autonomous motion active

DB39xx.DBX4000.4	**Drive-autonomous motion active** **Signals from axis/spindle: NC → PLC**
Update	cyclic
Signal state 1	Drive-autonomous motion is active. The axis traverses due to setpoints generated by drive-internal functions. The drive still responds to control signals of the NC, e.g. controller enable signal. Setpoints from the NC are ignored.
Signal state 0	Drive-autonomous motion is not active.
Description	DB39xx.DBX4000.4 = 1 **IF** MELDW.11 == 1 (controller enable signal) **AND** ZSW1.2 == 0 (operation enabled)
	Note • SINAMICS S120: Message word (MELDW) The message word (MELDW) is only contained in PROFIdrive telegrams compatible with SIMODRIVE 611U, for example, telegrams 102, 103, 105, 106, 110, 111, 116, 118, 125, 126, 136, 138, 139 • SINAMICS S120: Status word 1 / 2 (ZSW1/2) The status words ZSW1 and/or ZSW2 only refer to SIMODRIVE 611U-compatible PROFIdrive telegrams in the following (SIMODRIVE 611U Interface Mode, p2038 = 1)
	Application examples Internal drive functions: • Rotor or pole position identification • Function generator
More information	• Function Manual SINAMICS S120 Drive Functions • List Manual SINAMICS S120/S150, function diagram 2419 and 2420

Table 10-465 DB390x.DBX4001.0 to .4, motor/drive data set: Display

DB390x.DBX4001.0 to .4	**Motor/drive data set: Display** **Signals from axis/spindle: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Description	Display interface for the currently active motor (MDS) / drive data set (DDS).	
	Formatting Formatting the display interface, i.e. which bits are used to address the motor data sets (MDS) and which are used to address the drive data sets (DDS) is set via the formatting interface (DB390x, ...DBX4008.0 ... 4).	
See also	Table 10-383 DB380x.DBB4001.0 to .4, motor/drive data set: Selection (Page 343) Table 10-384 DB380x.DBX4001.5, motor is being selected (Page 343) Table 10-481 DB390x.DBX4008.0 - 4, motor/drive data set: Formatting (Page 388)	
More information	• Function Manual SINUMERIK 828D basic functions	

Table 10-466 DB390x.DBX4001.5, drive ready

DB390x.DBX4001.5	Drive ready Signals from axis/spindle: NC → PLC
Edge evaluation: No	Signal updated: cyclic
Signal state 1	Feedback signal from the drive to the PLC that the drive is ready.
Signal state 0	The drive is not ready. The drive might be disabled for the following reasons: • Drive alarm active (e.g. motor temperature has reached trip threshold). • DC-link voltage is too low. • Drive has not yet reached the cyclic operating state. • Hardware fault present. • No position measuring system is active ("Parking axis" state). • I/R is not switched on. As soon as the drive is not ready, it is shut down (depending on the fault state either with pulse disable or rapid stop) or pulses remain disabled while running up. The following interface signals are also reset: • "Drive ready" signal • "Current controller active" signal • "Speed controller active" signal
See also	Table 10-190 DB2700.DBX2.6, drive ready (Page 245) Table 10-416 DB390x.DBX1.7, current controller active (Page 359) Table 10-415 DB390x.DBX1.6, speed controller active (Page 358)
More information	• Function Manual SINUMERIK 828D basic functions

Table 10-467 DB390x.DBX4001.6, speed controller integrator disable

DB390x.DBX4001.6	Integrator disable, speed controller Signals from axis/spindle: NC → PLC
Edge evaluation: No	Signal updated: cyclic
Signal state 1	The requested shutdown of the speed controller integrator is active in the drive. The speed controller has been switched over from the PI to P control response.
Signal state 0	The integrator of the speed controller is enabled. The speed controller functions as a PI controller.
See also	DB380x.DBX40001.6, speed controller integrator disable (Page 344)
More information	• Function Manual SINUMERIK 828D Axes and Spindles

Table 10-468 DB390x.DBX4001.7, pulse enable

DB390x.DBX4001.7	Pulse enable Signals from axis/spindle: NC → PLC
Edge evaluation: No	Signal updated: cyclic
Signal state 1	The pulse enable for the drive is present. The axis/spindle can now be traversed.

DB390x.DBX4001.7	**Pulse enable** **Signals from axis/spindle: NC → PLC**
Signal state 0	The drive pulses are disabled. Therefore, the axis/spindle cannot be traversed. The pulses are disabled as soon as there is no enable signal. Also, if the "controller enable of drive" is withdrawn, the drive is stopped with setpoint 0 (regenerative braking). Pulse suppression is also triggered if there is no position measuring system ("Parking axis" state). As soon as the pulses are disabled, the following interface signals are also reset: • "Current controller active" signal • "Speed controller active" signal
See also	Table 10-416 DB390x.DBX1.7, current controller active (Page 359) Table 10-415 DB390x.DBX1.6, speed controller active (Page 358) Table 10-386 DB380x.DBX4001.7, pulse enable (Page 344)
More information	• Function Manual SINUMERIK 828D Axes and Spindles

DB39xx.DBX4002.0, temperature prewarning motor

Table 10-469 DB39xx.DBX4002.0, temperature prewarning motor

DB39xx.DBX4002.0	**Motor temperature prewarning** **Signals from axis/spindle: NC → PLC**
Update	cyclic
Signal state 1	The motor temperature has exceeded the warning threshold (p0604) configured in the drive. **Note** If the motor temperature remains too high for longer than the parameterized time (p0606), a fault is output, the drive is stopped and the pulse enable removed. If the motor temperature falls below the warning threshold (p0604) again before the time has expired (p0606), the interface signal is reset.
Signal state 0	The motor temperature is below the warning threshold (p0604).
More information	The actual motor temperature is displayed on the user interface at: Operating area "Diagnostics" > "Service display: Axis/spindle"
Corresponds with	DB39xx.DBX4002.1 (temperature prewarning heat sink)

DB39xx.DBX4002.1, temperature prewarning heat sink

Table 10-470 DB39xx.DBX4002.1, temperature prewarning heat sink

DB39xx.DBX4002.1	Heat sink temperature prewarning Signals from axis/spindle: NC → PLC
Update	cyclic
Signal state 1	The heat sink temperature of the power semiconductors has exceeded the parameterized warning threshold (p0294). **Note** The parameterized reaction (p0290) is performed in the drive. If the temperature violation remains, a fault is output after approx. 20 s, the drive is stopped and the pulse enable removed.
Signal state 0	The heat sink temperature is below the warning threshold.
Description	The interface signals DB39xx.DBX4002.0 and .1 are derived from the following signals of the cyclic drive telegram: • Case 1: Temperature alarm in the message word – DB39xx.DBX4002.0 ≙ MELDW, bit 6 (no motor overtemperature warning) – DB39xx.DBX4002.1 ≙ MELDW, Bit 7 (no warning thermal overload power unit) • Case 2: Alarm of alarm class B (interface mode "SIMODRIVE 611u", p2038=1) DB39xx.DBX4002.0 == 1 and DB39xx.DBX4002.1 == 1 if the following applies: cyclic drive telegram, ZSW1: bit 11 == 0 and 12 == 1 (alarm class B) The interface signals are derived from the alarm of alarm class B if there is no specific information from the message word. An alarm is displayed. Alarm number = 200.000 + alarm value (r2124)
	Note • SINAMICS S120: Message word (MELDW) The message word (MELDW) is only contained in PROFIdrive telegrams compatible with SIMODRIVE 611U, for example, telegrams 102, 103, 105, 106, 110, 111, 116, 118, 125, 126, 136, 138, 139 • SINAMICS S120: Status word 1 / 2 (ZSW1/2) The status words ZSW1 and/or ZSW2 only refer to SIMODRIVE 611U-compatible PROFIdrive telegrams in the following (SIMODRIVE 611U Interface Mode, p2038 = 1)
More information	• SINAMICS S120 Commissioning Manual • Function Manual SINAMICS S120 Drive Functions • SINAMICS S120/S150 List Manual – MELDW, bit 6 ≙ BO: r2135.14 → function diagram: 2548, 8016 – MELDW, bit 7 ≙ BO: r2135.15 → function diagram: 2548, 2452, 2456, 8016 • List Manual SINAMICS S120/S150, function diagram 2419 and 2420 • Diagnostics Manual SINUMERIK 828D, SINAMICS S120 Alarms

Table 10-471 DB390x.DBX4002.2, run-up completed

DB390x.DBX4002.2	**Booting completed** **Signals from axis/spindle: NC → PLC**
Edge evaluation: No	Signal updated: cyclic
Signal state 1	The drive signals back to the PLC which drive parameter set (DDS) is presently active. With bit combinations A, B and C, eight different drive parameter sets can be selected.
Signal state 0	The conditions described above have not yet been fulfilled. The run-up has therefore not yet been completed.
See also	Table 10-475 DB390x.DBX4002.6, nact = nset (Page 385) Table 10-472 DB390x.DBX4002.3, Md < Mdx (Page 384)
More information	• Function Manual SINUMERIK 828D basic functions

Table 10-472 DB390x.DBX4002.3, Md < Mdx

DB390x.DBX4002.3	**$M_d < M_{dx}$** **Signals from axis/spindle: NC → PLC**
Edge evaluation: No	Signal updated: cyclic
Signal state 1	The drive signals to the PLC that the torque setpoint M_d does not exceed the threshold torque M_{dx} in the steady-state condition (i.e. run-up completed). The torque threshold characteristic is speed-dependent. While running-up, the "$M_d < M_{dx}$" signal remains at 1. The signal only becomes active after run-up has been completed ("Run-up completed" signal = 1) and the signal interlock time for the threshold torque has expired.
Signal state 0	The torque setpoint M_d is greater than the threshold torque M_{dx}. If necessary, the PLC user program can initiate a response.
See also	Table 10-471 DB390x.DBX4002.2, run-up completed (Page 384)
More information	• Function Manual SINUMERIK 828D basic functions

Table 10-473 DB390x.DBX4002.4, nact < nmin

DB390x.DBX4002.4	**$n_{act} < n_{min}$** **Signals from axis/spindle: NC → PLC**
Edge evaluation: No	Signal updated: cyclic
Signal state 1	The drive signals to the PLC that the actual speed value n_{act} is less than the minimum speed (n_{min}).
Signal state 0	The actual speed value is greater than the threshold minimum speed.
More information	• Function Manual SINUMERIK 828D basic functions

Table 10-474 DB390x.DBX4002.5, nact < nx

DB390x.DBX4002.5	**$n_{act} < n_x$** **Signals from axis/spindle: NC → PLC**
Edge evaluation: No	Signal updated: cyclic
Signal state 1	The drive signals to the PLC that the actual speed value n_{act} is less than the threshold speed (n_x).
Signal state 0	The actual speed value is greater than the threshold speed.
More information	• Function Manual SINUMERIK 828D basic functions

Table 10-475 DB390x.DBX4002.6, nact = nset

DB390x.DBX4002.6	**$n_{act} = n_{set}$** **Signals from axis/spindle: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The PLC is signaled that after a new speed setpoint specification, the actual speed value has reached the speed tolerance band and has remained within this tolerance band for the specified time. If the actual speed value leaves the tolerance band, then contrary to the "Run-up completed" signal, the "$n_{act} = n_{set}$" interface signal is set to 0.	
Signal state 0	The conditions described above have not yet been fulfilled. The actual speed value is outside the speed tolerance band.	
See also	Table 10-471 DB390x.DBX4002.2, run-up completed (Page 384)	
More information	• Function Manual SINUMERIK 828D basic functions	

Table 10-476 DB390x.DBX4002.7, variable signaling function

DB390x.DBX4002.7	**Variable signaling function** **Signals from the axis/spindle: NC → PLC**	
Edge evaluation: No	Signal updated: cyclically	
Signal state 1	The drive signals to the PLC that the threshold value of the quantity to be monitored has been exceeded. With the variable signal function, it is possible to monitor for any axis any quantity from the drive, which can be parameterized, to check if it violates a certain threshold, which can then be signaled as interface signal to the PLC. Monitoring: The parameterized variable is monitored to check whether it exceeds a defined threshold. In addition, a tolerance band (hysteresis) can be defined which is considered when scanning for violation of the threshold value. Further, the "Threshold value exceeded" signal can be logically combined with a pull-in and drop-out delay time. Selection: The variable to be monitored can be selected by entering a signal number or by entering a symbolic address.	
Signal state 0	The drive signals the PLC that the threshold value of the quantity to be monitored has not been exceeded or the specified conditions are not fulfilled. If the variable signaling function is disabled the signal state "0" is output to the PLC.	
Application	With the variable signal function the machine tool manufacturer can monitor one additional threshold value for specific applications for each axis/spindle and evaluate the result in the PLC user program. Example: The interface signal "Variable signaling function" should be set to 1 when the motor torque exceeds 50% of the rated torque.	

Table 10-477 DB390x.DBX4003.0, VDClink < VDClinkx

DB390x.DBX4003.0	**$V_{DClink} < V_{DClinkx}$** **Signals from axis/spindle: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The drive signals the PLC that the DC-link voltage V_{DClink} is less than the DC-link undervoltage threshold $V_{DClinkx}$. The DC-link undervoltage threshold is defined using r0296. The DC-link undervoltage threshold should be defined to be greater than 400 V. If the DC-link voltage drops below 280 V, the unit is powered-down by the hardware.	
Signal state 0	The DC-link voltage is less than the DC-link undervoltage alarm threshold.	
See also	r0296, DC-link voltage, undervoltage threshold	
More information	• Function Manual SINUMERIK 828D Axes and Spindles	

DB39xx.DBX4003.3, generator operation minimum speed not reached

Table 10-478 DB39xx.DBX4003.3, ESR: Generator operation - minimum speed not reached

DB39xx.DBX4003.3	**ESR: Generator operation - minimum speed not reached** **Signals from axis/spindle: NC → PLC**
Update	cyclic
Signal state 1	The axis is parameterized as generator axis. The drive signals that the actual speed is **less** than the minimum speed set using parameter p2161 (speed threshold value 3).
Signal state 0	The axis is parameterized as generator axis. The drive signals that the actual speed is **greater** than the minimum speed set using parameter p2161 (speed threshold value 3).
Description	The PLC user program can initiate measures in order to safely end machining and/or to buffer the DC link voltage, e.g. initiate a drive-based and/or control-managed extended stop and retract (ESR).
Corresponds with	Drive parameter p2161 (speed threshold value 3) Drive telegram MELDW.Bit2
More information	• Commissioning Manual SINUMERIK 828D Commissioning CNC

DB390x.DBX4003.4, variable signaling function 2

Table 10-479 DB390x.DBX4003.4, variable signaling function 2

DB390x.DBX4003.4	Variable signaling function Signals from the axis/spindle: NC → PLC	
Edge evaluation: No	Signal updated: cyclically	
Signal state 1	The drive signals to the PLC that the threshold value of the quantity to be monitored has been exceeded. With the variable signal function, it is possible to monitor for any axis any quantity from the drive, which can be parameterized, to check if it violates a certain threshold, which can then be signaled as interface signal to the PLC. Monitoring: The parameterized variable is monitored to check whether it exceeds a defined threshold. In addition, a tolerance band (hysteresis) can be defined which is considered when scanning for violation of the threshold value. Further, the "Threshold value exceeded" signal can be logically combined with a pull-in and drop-out delay time. Selection: The variable to be monitored can be selected by entering a signal number or by entering a symbolic address.	
Signal state 0	The drive signals the PLC that the threshold value of the quantity to be monitored has not been exceeded or the specified conditions are not fulfilled. If the variable signaling function is disabled the signal state "0" is output to the PLC.	
Application	With the variable signal function the machine tool manufacturer can monitor one additional threshold value for specific applications for each axis/spindle and evaluate the result in the PLC user program. Example: The interface signal "Variable signaling function" should be set to 1 when the motor torque exceeds 50% of the rated torque.	

DB390x.DBX4003.5, variable signaling function 3

Table 10-480 DB390x.DBX4003.5, variable signaling function

DB390x.DBX4003.5	Variable signaling function Signals from the axis/spindle: NC → PLC	
Edge evaluation: No	Signal updated: cyclically	
Signal state 1	The drive signals to the PLC that the threshold value of the quantity to be monitored has been exceeded. With the variable signal function, it is possible to monitor for any axis any quantity from the drive, which can be parameterized, to check if it violates a certain threshold, which can then be signaled as interface signal to the PLC. Monitoring: The parameterized variable is monitored to check whether it exceeds a defined threshold. In addition, a tolerance band (hysteresis) can be defined which is considered when scanning for violation of the threshold value. Further, the "Threshold value exceeded" signal can be logically combined with a pull-in and drop-out delay time. Selection: The variable to be monitored can be selected by entering a signal number or by entering a symbolic address.	

DB390x.DBX4003.5	**Variable signaling function** **Signals from the axis/spindle: NC → PLC**
Signal state 0	The drive signals the PLC that the threshold value of the quantity to be monitored has not been exceeded or the specified conditions are not fulfilled. If the variable signaling function is disabled the signal state "0" is output to the PLC.
Application	With the variable signal function the machine tool manufacturer can monitor one additional threshold value for specific applications for each axis/spindle and evaluate the result in the PLC user program. Example: The interface signal "Variable signaling function" should be set to 1 when the motor torque exceeds 50% of the rated torque.

Table 10-481 DB390x.DBX4008.0 - 4, motor/drive data set: Formatting

DB390x.DBX4008.0 - 4	**Motor/drive data set: Formatting** **Signals from NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	Formatting interface for the currently active motor (MDS) / drive data set (DDS).	
Signal state 0	The integrator of the speed controller is enabled. The speed controller functions as a PI controller.	
See also	Table 10-383 DB380x.DBB4001.0 to .4, motor/drive data set: Selection (Page 343) Table 10-384 DB380x.DBX4001.5, motor is being selected (Page 343) Table 10-465 DB390x.DBX4001.0 to .4, motor/drive data set: Display (Page 380)	
More information	• Function Manual SINUMERIK 828D basic functions	

Signals from technology functions

Table 10-482 DB390x.DBX5000.2, master/slave fine

DB390x.DBX5000.2	**Master/slave fine** **Signals from axis/spindle: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The differential speed is specified in the following machine data: MD37272 $MA_MS_VELO_TOL_FINE: Master-slave velocity tolerance fine.	
Signal state 0	The differential speed has not reached the range defined in MD37272.	

Table 10-483 DB390x.DBX5000.3, master/slave coarse

DB390x.DBX5000.3	**Master/slave coarse** **Signals from axis/spindle: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The differential speed is specified in the following machine data: MD37270 $MA_MS_VELO_TOL_COARSE: Master-slave velocity tolerance coarse.	
Signal state 0	The differential speed has not reached the range defined in MD37270.	

Table 10-484 DB390x.DBX5000.4, master/slave compensatory controller active

DB390x.DBX5000.4	**Master/slave compensatory controller active** **Signals from axis/spindle: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	Torque compensatory control is active.	
Signal state 0	Torque compensatory control is not active. The signal at the slave axis of a coupling is relevant.	

DB390x.DBX5000.5, control over the drive taken over

Table 10-485 DB3900.DBX5000.5, control over the drive taken over

DB3900.DBX5000.5	**Control over the drive taken over** **Signals from the axis/spindle: NC → PLC**
Edge evaluation: No	Signal updated: Cyclically
Signal state 1	The axis has taken over control of the drive.
Signal state 0	The axis has **not** taken over control of the drive.
Further information	The controller enable (DB380x.DBX2.1) can only be issued if the axis has control over the drive: DB390x.DBX5000.5 == 1 **Note:** All axes involved in setpoint exchange that currently do not have drive control are switched to follow-up mode by the control. I.e. they are not in position control. We therefore recommend that suspended axes are assigned a brake control.
See also	DB380x.DBX2.1, controller enable (Page 322) DB380x.DBX5000.5, take over control of drive (Page 345)

Table 10-486 DB390x.DBX5000.7, master/slave active

DB390x.DBX5000.7	**Master/slave active** **Signals from axis/spindle: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	Master-slave coupling is active.	
Signal state 0	Master-slave coupling is not active. The signal at the slave axis of a coupling is relevant.	

Table 10-487 DB390x.DBX5002.0, fine synchronism

DB390x.DBX5002.0	**Fine synchronism** **Signals from axis/spindle: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The positional deviation or velocity difference between the following spindle and its leading spindle is within the "Fine synchronism" tolerance band.	

DB390x.DBX5002.0	**Fine synchronism** **Signals from axis/spindle: NC → PLC**
Signal state 0	The positional deviation or velocity difference between the following spindle and its leading spindle is not within the "Fine synchronism" tolerance band. Note: The signal is relevant only for the following spindle in synchronous operation.
Application	Clamping of the workpiece in the following spindle at the transfer from the leading spindle: The clamping of the workpiece is only initiated by the PLC user program when the spindles are running synchronous enough.
See also	Table 10-457 DB390x.DBX2002.4, active spindle mode, synchronous mode (Page 377) MD37210 $MA_COUPLE_POS_TOL_FINE: Threshold value for "Fine synchronism" MD37230 $MA_COUPLE_VELO_TOL_FINE: Velocity tolerance "fine"

Table 10-488 DB390x.DBX5002.1, coarse synchronism

DB390x.DBX5002.1	**Coarse synchronism** **Signals from axis/spindle: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The positional deviation or velocity difference between the following spindle and its leading spindle is within the "Coarse synchronism" tolerance band. Note: The signal is relevant only for the following spindle in synchronous operation.	
Signal state 0	The positional deviation or velocity difference between the following spindle and its leading spindle is not within the "Coarse synchronism" tolerance band.	
Application	Clamping of the workpiece in the following spindle at the transfer from the leading spindle. The clamping of the workpiece is only initiated by the PLC user program when the spindles are running synchronous enough.	
See also	Table 10-457 DB390x.DBX2002.4, active spindle mode, synchronous mode (Page 377) MD37200 $MA_COUPLE_POS_TOL_COARSE: Threshold value for "Coarse synchronism" MD37220 $MA_COUPLE_VELO_TOL_COARSE: Velocity tolerance "coarse"	
More information	• Function Manual SINUMERIK 828D Axes and Spindles	

DB39xx.DBX5002.2, actual value coupling

Table 10-489 DB39xx.DBX5002.2, actual value coupling

DB39xx.DBX5002.2	**Actual value coupling** **Signals from axis/spindle: NC → PLC**
Update	cyclic
Signal state 1	Synchronous spindle coupling: Actual value coupling active
Signal state 0	Synchronous spindle coupling: Setpoint coupling active

DB39xx.DBX5002.2	**Actual value coupling** **Signals from axis/spindle: NC → PLC**
Description	**Note** The signal is relevant only for the active following spindle in synchronous operation. **Special cases or errors** If faults occur on the following spindle that cause a withdrawal of the "Controller enable" for the following spindle, under certain circumstances, the control may exchange the coupling relationship of the following spindle and leading spindle and switch to actual value coupling.
Corresponds with	DB39xx.DBX2002.4 (Active spindle mode: synchronous mode) MD21310 $MC_COUPLING_MODE_1 (coupling type in synchr. spindle oper.)
More information	• Function Manual SINUMERIK 828D Axes and Spindles

Table 10-490 DB390x.DBX5002.4, overlaid motion

DB390x.DBX5002.4	**Overlaid motion** **Signals from axis/spindle: NC → PLC**
Edge evaluation: No	Signal updated: cyclic
Signal state 1	The following spindle executes an additional motion component that is superimposed on the motion from the coupling with the leading spindle. Example for overlaid motion of the following spindle: • Activating the synchronous mode with a defined angular offset between the following spindle and leading spindle. • Activating the synchronous mode for rotating leading spindle. • Changing the ratio while the synchronous mode is active. • Entering a new defined angular offset when the synchronous mode is active. • Traversing the following spindle with plus or minus traversing keys or handwheel in JOG when the synchronous mode is active. As soon as the following spindle executes a overlaid motion, the "Fine synchronism" signal or the "Coarse synchronism" signal (depending on threshold value) can be canceled immediately. Note: The signal is relevant only for the following spindle in synchronous operation.
Signal state 0	The following spindle does not traverse through any additional motion component or this has been completed.
See also	Table 10-457 DB390x.DBX2002.4, active spindle mode, synchronous mode (Page 377)
More information	• Function Manual SINUMERIK 828D Axes and Spindles

Table 10-491 DB390x.DBX5002.5, velocity warning threshold reached

DB390x.DBX5002.5	**Velocity warning threshold reached** **Signals from axis/spindle: NC → PLC**
Edge evaluation: No	Signal updated: cyclic
Signal state 1	When the velocity of the following axis in the axis grouping of the electronic gear reaches or exceeds the percentage of the velocity entered in MD37550, which is set in MD32000, then the signal is set to "1".
Signal state 0	The following axis velocity in the axis grouping of the electronic gear is less than the threshold value described above.

DB390x.DBX5002.5	**Velocity warning threshold reached** **Signals from axis/spindle: NC → PLC**
See also	MD37550 $MA_EG_VEL_WARNING: Threshold value for velocity warning threshold MD32000 $MA_MAX_AX_VELO: Maximum axis velocity
More information	• Function Manual SINUMERIK 828D Axes and Spindles

Table 10-492 DB390x.DBX5002.6, acceleration warning threshold reached

DB390x.DBX5002.6	**Acceleration warning threshold reached** **Signals from axis/spindle: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	When the acceleration of the following axis in the axis grouping of the electronic gear reaches or exceeds the percentage of the acceleration entered in MD37550, which is set in MD32300, then the signal is set to "1".	
Signal state 0	The following axis acceleration in the axis grouping of the electronic gear is less than the threshold value described above.	
See also	MD37550 $MA_EG_VEL_WARNING: Threshold value for velocity warning threshold MD32300 $MA_MAX_AX_ACCEL: Axis acceleration	
More information	• Function Manual SINUMERIK 828D Axes and Spindles	

Table 10-493 DB390x.DBX5002.7, ESR reaction is triggered

DB390x.DBX5002.7	**ESR reaction is triggered** **Signals from axis/spindle: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	Status signal The VDI signal "ESR reaction is triggered" is available as feedback signal to the PLC. The signal is set, if $AA_ESR_STAT is > 0, i.e. if: • Generator operation, stopping or retraction in progress. • DC-link undervoltage detected. • Generator minimum speed undershot.	
Signal state 0	ESR is not active.	
Application	For safety reasons, an emergency stop interrupts the interpolation and all traversing motion, and also cancels the electronic coupling by withdrawing the controller enable signals. In applications where the coupling and traversing motion must be retained during an emergency stop, this emergency stop must be delayed long enough by the PLC for the required NC or drive-side reactions to be completed. Writing in $A_DBB allows the PLC to extensively influence the execution of the ESR reactions, if appropriate access is also integrated into the synchronized actions. The PLC has a "locking influence" on the ESR reaction.	
More information	• Function Manual SINUMERIK 828D Axes and Spindles	

Table 10-494 DB390x.DBX5003.0, LS (leading spindle) active

DB390x.DBX5003.0	**LS (leading spindle) active** **Signals from axis/spindle: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The machine axis is currently being operated as a following spindle. As a consequence, the following spindle follows the movements of the leading spindle in synchronous mode in accordance with the gear ratio. Note: The signal is relevant only in synchronous operation.	
Signal state 0	The machine axis is currently not being operated as a following spindle.	
Special cases, errors, etc.	If faults occur on the following spindle that cause a withdrawal of the "Controller enable" for the FS, under certain circumstances, the control may exchange the coupling relationship of the FS and LS and switch to actual value coupling.	
See also	Table 10-457 DB390x.DBX2002.4, active spindle mode, synchronous mode (Page 377) Table 10-495 DB390x.DBX5003.1, FS (following spindle) active (Page 393)	
More information	• Function Manual SINUMERIK 828D Axes and Spindles	

Table 10-495 DB390x.DBX5003.1, FS (following spindle) active

DB390x.DBX5003.1	**FS (following spindle) active** **Signals from axis/spindle: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The machine axis is currently being operated as a following spindle. As a consequence, the following spindle follows the movements of the leading spindle in synchronous mode in accordance with the gear ratio. Note: The signal is relevant only in synchronous operation.	
Signal state 0	The machine axis is currently not being operated as a following spindle.	
Special cases, errors, etc.	If faults occur on the following spindle that cause a withdrawal of the "Controller enable" for the FS, under certain circumstances, the control may exchange the coupling relationship of the FS and LS and switch to actual value coupling.	
See also	Table 10-457 DB390x.DBX2002.4, active spindle mode, synchronous mode (Page 377) Table 10-494 DB390x.DBX5003.0, LS (leading spindle) active (Page 393)	
More information	• Function Manual SINUMERIK 828D Axes and Spindles	

Table 10-496 DB390x.DBX5003.3, axis accelerated

DB390x.DBX5003.3	**Axis accelerating** **Signals from axis/spindle: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	When the acceleration of the following axis in the axis grouping of the electronic gear reaches or exceeds the percentage of the acceleration entered in MD37560, which is set in MD32300, then the signal is set to "1".	
Signal state 0	The following axis acceleration in the axis grouping of the electronic gear is less than the response value described above.	

DB390x.DBX5003.3	**Axis accelerating** **Signals from axis/spindle: NC → PLC**
See also	MD37560 $MA_ EG_ACC_TOL: Threshold value for "Accelerate axis" MD32300 $MA_MAX_AX_ACCEL: Axis acceleration
More information	• Function Manual SINUMERIK 828D Axes and Spindles

DB39xx.DBX5004.2, oscillation reversal is active

Table 10-497 DB39xx.DBX5004.2, external oscillation reversal active

DB39xx.DBX5004.2	**External oscillation reversal active** **Signals from axis/spindle: NC → PLC**
Update	cyclic
Signal state 1	The braking phase after "oscillation reversal from external" is active.
Signal state 0	The braking phase after "oscillation reversal from external" is **not** active.
Corresponds with	DB38xx.DBX5004.0 (oscillation reversal from external)

DB39xx.DBX5004.3, oscillation cannot be started

Table 10-498 DB39xx.DBX5004.3, oscillation cannot be started

DB39xx.DBX5004.3	**Oscillation cannot be started** **Signals from axis/spindle: NC → PLC**
Update	cyclic
Signal state 1	The oscillation axis cannot be started.
Signal state 0	Oscillation motion cannot be started.
Description	This signal is set if there is a programming error, for example. **Note** This state can also occur if axis was already traversed.

DB39xx.DBX5004.4, error during oscillation movement

Table 10-499 DB39xx.DBX5004.4, error during oscillation movement

DB39xx.DBX5004.4	**Error during oscillation** **Signals from axis/spindle: NC → PLC**
Signal state 1	Oscillation motion was canceled as an error occurred while oscillating.
Signal state 0	Oscillation is error free.

DB39xx.DBX5004.5, sparking out active

Table 10-500 DB39xx.DBX5004.5, sparking out active

DB39xx.DBX5004.5	Sparking-out active Signals from axis/spindle: NC → PLC
Update	cyclic
Signal state 1	The axis executes sparking-out strokes.
Signal state 0	The axis is presently **not** executing any sparking-out strokes.
Corresponds with	DB39xx.DBX5004.7 (oscillation active)

DB39xx.DBX5004.6, oscillation movement active

Table 10-501 DB39xx.DBX5004.6, oscillation movement active

DB39xx.DBX5004.6	Oscillation active Signals from axis/spindle: NC → PLC
Update	cyclic
Signal state 1	The axis performs an oscillation movement between two reversal points.
Signal state 0	The axis is **not** currently oscillating.
Description	The signal is irrelevant: DB39xx.DBX5004.7 == 0
Corresponds with	DB39xx.DBX5004.7 (oscillation active)

DB39xx.DBX5004.7, oscillation active

Table 10-502 DB39xx.DBX5004.7, oscillation active

DB39xx.DBX5004.7	Oscillation active Signals from axis/spindle: NC → PLC
Update	cyclic
Signal state 1	The axis is presently being traversed as oscillating axis.
Signal state 0	The axis is a positioning axis.
Corresponds with	DB39xx.DBX5004.5 (sparking out active) DB39xx.DBX5004.6 (oscillation movement active)

Table 10-503 DB390x.DBX5005.4, gantry synchronization ready to start

DB390x.DBX5005.4	**Gantry synchronization ready to start** **Signals from axis/spindle: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	After gantry axis referencing, the monitoring function has detected that the actual position value deviation between the leading and synchronized axes is greater than the gantry warning limit: MD37110 $MA_GANTRY_POS_TOL_WARNING: Gantry warning limit. It is therefore not possible to start the automatic synchronization compensatory motion of the gantry axes internally in the control. The compensatory motion must be started by the user or the PLC user program ("Start gantry synchronization" signal). The signal is processed for the gantry leading axis only.	
Signal state 0	After the synchronization compensatory motion has been started by the PLC user program, "Start gantry synchronization" signal = 1.	
Signal irrelevant for ...	Gantry synchronous axis	
See also	MD37110 $MA_GANTRY_POS_TOL_WARNING: Gantry warning limit Table 10-400 DB380x.DBX5005.4, start gantry synchronization (Page 351) Table 10-405 DB390x.DBX0.4, referenced/synchronized 1 (Page 354) Table 10-406 DB390x.DBX0.5, referenced/synchronized 2 (Page 354)	
More information	• Function Manual SINUMERIK 828D Axes and Spindles	

Table 10-504 DB390x.DBX5005.5, gantry grouping is synchronized

DB390x.DBX5005.5	**Gantry grouping is synchronized** **Signals from axis/spindle: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The gantry axis grouping defined with the machine data MD37100 is synchronized. Any existing misalignment between the leading and synchronous axes, e.g. after start-up of the machine, is eliminated by the gantry axis synchronization. The synchronization process is initiated either automatically once the gantry axes have been referenced or via the PLC user program, "Start gantry synchronization" signal. The compensation values for temperature and sag do not become effective internally in the control until the gantry grouping is synchronized. Note: The "Gantry grouping is synchronized" signal is output to the PLC via the PLC interface of the leading axis.	
Signal state 0	The gantry axis grouping defined with the machine data MD37100 is not synchronized. This means that the positions of the leading and synchronized axes may not be ideally aligned, e.g. gantry misalignment. Workpiece machining with a non-synchronized gantry axis grouping will result in impaired machining accuracy or mechanical damage to the machine. The gantry grouping becomes desynchronized if: • The gantry axes were in "Follow-up" mode. • The reference position of a gantry axis is no longer valid or the axis is referenced again, "Referenced/synchronized" signal. • The gantry grouping has been broken up via the following machine data: MD37140 $MA_GANTRY_BREAK_UP: Break up gantry axis grouping.	

DB390x.DBX5005.5	Gantry grouping is synchronized Signals from axis/spindle: NC → PLC
Application	Machining should be enabled only if the gantry axes are already synchronized. This can be implemented in the PLC user program by combining NC Start with the "Gantry grouping is synchronized" signal.
Signal irrelevant for ...	Gantry synchronous axis
See also	MD37100 $MA_GANTRY_AXIS_TYPE: Gantry axis definition MD37140 $MA_GANTRY_BREAK_UP: Break up gantry axis grouping Table 10-400 DB380x.DBX5005.4, start gantry synchronization (Page 351) Table 10-405 DB390x.DBX0.4, referenced/synchronized 1 (Page 354) Table 10-406 DB390x.DBX0.5, referenced/synchronized 2 (Page 354)
More information	• Function Manual SINUMERIK 828D Axes and Spindles

Table 10-505 DB390x.DBX5006.5 and .6, position measuring system 1/2 activated

DB390x.DBX5006.5 DB390x.DBX5006.6	Position measuring system 1/2 activated Signals from axis/spindle: NC → PLC	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The position measuring system is in the "active" or "passive" state. Monitoring and updating the position measuring system is activated.	
Signal state 0	The position measuring system has "parked" status. Monitoring and updating the position measuring system is deactivated. "Parked" status is entered if: • for the axis/spindle, the NC/PLC interfaces signals for the configured position measuring systems and control enable are reset: – DB390x.DBX5006.5 = 0 (position measuring system 1) – DB390x.DBX5006.6 = 0 (position measuring system 2) – DB380x.DBX2.1 = 0 (controller enable) or • "parking the passive position measuring system" is active for the measuring system: – MD31046 $MA_ENC_PASSIVE_PARKING[<n>] = 1 with <n> = 0 (position measuring system 1) or 1 (position measuring system 2) and the NC/PLC interface signal for the position measuring system has been reset to "0" by the user: – DB390x.DBX5006.5 = 0 (position measuring system 1) or – DB390x.DBX5006.6 (position measuring system 2)	
More information	• Function Manual SINUMERIK 828D basic functions	

Table 10-506 DB390x.DBX5008.0 to .5, active infeed axes

DB390x.DBX5008.0 to .5	**Active infeed axes** **Signals from axis/spindle: NC → PLC**
Edge evaluation: No	Signal updated: cyclic
Signal state 1	The axis from which the signal comes is currently an oscillating axis and signals its active infeed axes in this field, e.g.: DBX5008.0, axis 1 is infeed axis, DBX5008.1, axis 2 is infeed axis, etc.
Signal state 0	The associated axis is not an infeed axis.

Spindle with WEISS spindle sensor module.

Table 10-507 DB390x.DBX7000.0, sensors available

DB390x.DBX7000.0	**Sensors available** **Signals from spindle: NC → PLC**
Edge evaluation: No	Signal updated: Power up
Signal state 1	The sensors required for the spindles are available.
Signal state 0	The sensors required for the spindles are not available.
See also	Table 10-508 DB390x.DBX7000.1, sensor S1 available (clamped state) (Page 398) Table 10-509 DB390x.DBX7000.4, sensor S4 available (piston end position) (Page 398) Table 10-510 DB390x.DBX7000.5, sensor S5 available (angular position of the motor shaft) (Page 399)
More information	• Function Manual SINUMERIK 828D Axes and Spindles

Table 10-508 DB390x.DBX7000.1, sensor S1 available (clamped state)

DB390x.DBX7000.1	**Sensor S1 available (clamped state)** **Signals from spindle: NC → PLC**
Edge evaluation: No	Signal updated: Power up
Signal state 1	Sensor S1 is available.
Signal state 0	Sensor S1 is not available.
See also	Table 10-512 DB390x.DBW7002, status of the clamping system (sensor S1) (Page 399) Table 10-513 DB390x.DBW7004, analog measured value of the clamping system (sensor S1) (Page 400)
More information	• Function Manual SINUMERIK 828D Axes and Spindles

Table 10-509 DB390x.DBX7000.4, sensor S4 available (piston end position)

DB390x.DBX7000.4	**Sensor S4 available (piston end position)** **Signals from spindle: NC → PLC**
Edge evaluation: No	Signal updated: Power up
Signal state 1	Sensor S4 is available.
Signal state 0	Sensor S4 is not available.

DB390x.DBX7000.4	**Sensor S4 available (piston end position)** **Signals from spindle: NC → PLC**
See also	Table 10-514 DB390x.DBX7006.4, sensor S4 piston end position (Page 400)
More information	• Function Manual SINUMERIK 828D Axes and Spindles

Table 10-510 DB390x.DBX7000.5, sensor S5 available (angular position of the motor shaft)

DB390x.DBX7000.5	**Sensor S5 available (angular position of the motor shaft)** **Signals from spindle: NC → PLC**	
Edge evaluation: No	Signal updated: Power up	
Signal state 1	Sensor S5 is available.	
Signal state 0	Sensor S5 is not available.	
See also	Table 10-515 DB390x.DBX7006.5, sensor S5, angular position of the motor shaft (Page 401)	
More information	• Function Manual SINUMERIK 828D Axes and Spindles	

Table 10-511 DB390x.DBX7001.2, state value is generated, speed limitation p5043 is active

DB390x.DBX7001.2	**State value is generated, speed limitation p5043 is active** **Signals from spindle: NC → PLC**	
Edge evaluation: No	Signal updated: Power up	
Signal state 1	The state value is generated and the speed limitations from drive parameter p5043 are active.	
Signal state 0	The state value is not generated and the speed limitations from drive parameter p5043 are not active.	
Note	When generating the state value, the analog voltage values of sensor S1 are transformed into discrete state values of drive parameter r5001.	
See also	Table 10-512 DB390x.DBW7002, status of the clamping system (sensor S1) (Page 399) Drive parameters: r5001 System variable: $VA_MOT_CLAMPING_STATE[<axis>] NC variables: vaMotClampingState	
More information	• Function Manual SINUMERIK 828D Axes and Spindles	

Table 10-512 DB390x.DBW7002, status of the clamping system (sensor S1)

DB390x.DBW7002	**Status of the clamping system (sensor S1)** **Signals from spindle: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Description	Depending on the position of the clamping device, sensor S1 supplies an analog voltage value. To simplify evaluation of the clamped state, the analog voltage of the spindle sensor module is converted to a status value. The state values correspond to certain voltage ranges. The voltage ranges can be set via: Drive parameter p5041[0...5].	
	State value	**Clamped state**
	0	Sensor S1 not available or state values inactive
	1	State being initialized, speed limit 0 [rpm]
	2	Released with signal (error state), alarm, speed limit 0 [rpm]

DB390x.DBW7002	**Status of the clamping system (sensor S1)** **Signals from spindle: NC → PLC**	
	3	Tool released/ejected, speed limit see p5043[0]
	4	Clamping (using spring force), speed limit see p5043[1]
	5	Releasing (using compressed air), speed limit see p5043[2]
	6	Releasing (using compressed air), speed limit see p5043[3]
	7	Clamped with tool, speed limit see p5043[4]
	8	Clamped with tool, speed limit see p5043[4]
	9	Clamping further (using spring force), speed limit see p5043[5]
	10	Clamped without tool, speed limit see p5043[6]
	11	Clamped with message, alarm speed limit 0 [rpm]
See also	Table 10-513 DB390x.DBW7004, analog measured value of the clamping system (sensor S1) (Page 400) Drive parameters: p5041[0...5], p5043[0...6]	
More information	• Function Manual SINUMERIK 828D Axes and Spindles	

Table 10-513 DB390x.DBW7004, analog measured value of the clamping system (sensor S1)

DB390x.DBW7004	**Analog measured value of the clamping system (sensor S1)** **Signals from spindle: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Description	Sensor S1 supplies an analog voltage value: 0 - 10V. The analog value of the clamping state is emulated as follows: 0 - 10,000 increments, resolution 1 mV. The state values correspond to certain voltage ranges. The voltage ranges can be set via: Drive parameter p5041[0...5].	
Note	SIMATIC S7 input module: 0 - 27,648 increments, resolution 0, 36 mV. Adaptation factor when changing to a spindle with SMI 24: 2.7648.	
See also	Table 10-512 DB390x.DBW7002, status of the clamping system (sensor S1) (Page 399) Drive parameters: p5041[0...5], p5043[0...6]	
More information	• Function Manual SINUMERIK 828D Axes and Spindles	

Table 10-514 DB390x.DBX7006.4, sensor S4 piston end position

DB390x.DBX7006.4	**Sensor S4, piston end position** **Signals from spindle: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	The piston is in position, i.e. the piston is free to move.	
Signal state 0	The piston is not in position.	
See also	Table 10-509 DB390x.DBX7000.4, sensor S4 available (piston end position) (Page 398)	
More information	• Function Manual SINUMERIK 828D Axes and Spindles	

Table 10-515 DB390x.DBX7006.5, sensor S5, angular position of the motor shaft

DB390x.DBX7006.5	**Sensor S5, angular position of the motor shaft** **Spindle with WEISS spindle sensor module: NC → PLC**	
Edge evaluation: No	Signal updated: cyclic	
Signal state 1	Prerequisite: The spindle is stationary The motor shaft is in position.	
Signal state 0	The motor shaft is not aligned.	
See also	Table 10-510 DB390x.DBX7000.5, sensor S5 available (angular position of the motor shaft) (Page 399)	
More information	• Function Manual SINUMERIK 828D Axes and Spindles	

10.2.7 Tool management

10.2.7.1 Loading, unloading and reloading

DB41xx.DBWy056, distance coding

Table 10-516 DB41xx.DBWy056, distance coding

DB4100.DBWy056	**Distance coding**
Signal flow	NC → PLC
Update	Job-controlled
Signal state 1	Type of distance coding of the multitool (corresponds to $TC_MTP_KD) 1 = location number 2 = distance 3 = angle
Signal state 0	No distance coding specified.
More information	Start addresses of the turrets: Spindle 1: n = 0 Spindle 2: n = 50 Spindle 3: n = 100

DB41xx.DBWy140, distance coding

Table 10-517 DB41xx.DBWy140, distance coding

DB4100.DBWy140	**Distance coding**
Signal flow	NC → PLC
Update	Job-controlled

DB4100.DBWy140	Distance coding
Signal state 1	Type of distance coding of the multitool (corresponds to $TC_MTP_KD) 1 = location number 2 = distance 3 = angle
Signal state 0	No distance coding specified.
More information	Start addresses of the turrets: Spindle 1: n = 0 Spindle 2: n = 50 Spindle 3: n = 100

10.2.7.2 Tool change

DB43xx.DBWy056, distance coding

Table 10-518 DB43xx.DBWy056, distance coding

DB4300.DBWy056	Distance coding
Signal flow	NC → PLC
Update	Job-controlled
Signal state 1	Type of distance coding of the multitool (corresponds to $TC_MTP_KD) 1 = location number 2 = distance 3 = angle
Signal state 0	No distance coding specified.
More information	Start addresses of the turrets: Spindle 1: n = 0 Spindle 2: n = 50 Spindle 3: n = 100

DB43xx.DBWy140, distance coding

Table 10-519 DB43xx.DBWy140, distance coding

DB4300.DBWy140	Distance coding
Signal flow	NC → PLC
Update	Job-controlled
Signal state 1	Type of distance coding of the multitool (corresponds to $TC_MTP_KD) 1 = location number 2 = distance 3 = angle

DB4300.DBWy140	Distance coding
Signal state 0	No distance coding specified.
More information	Start addresses of the turrets: Spindle 1: n = 0 Spindle 2: n = 50 Spindle 3: n = 100

10.2.8 Tool management functions from the channel

Overview

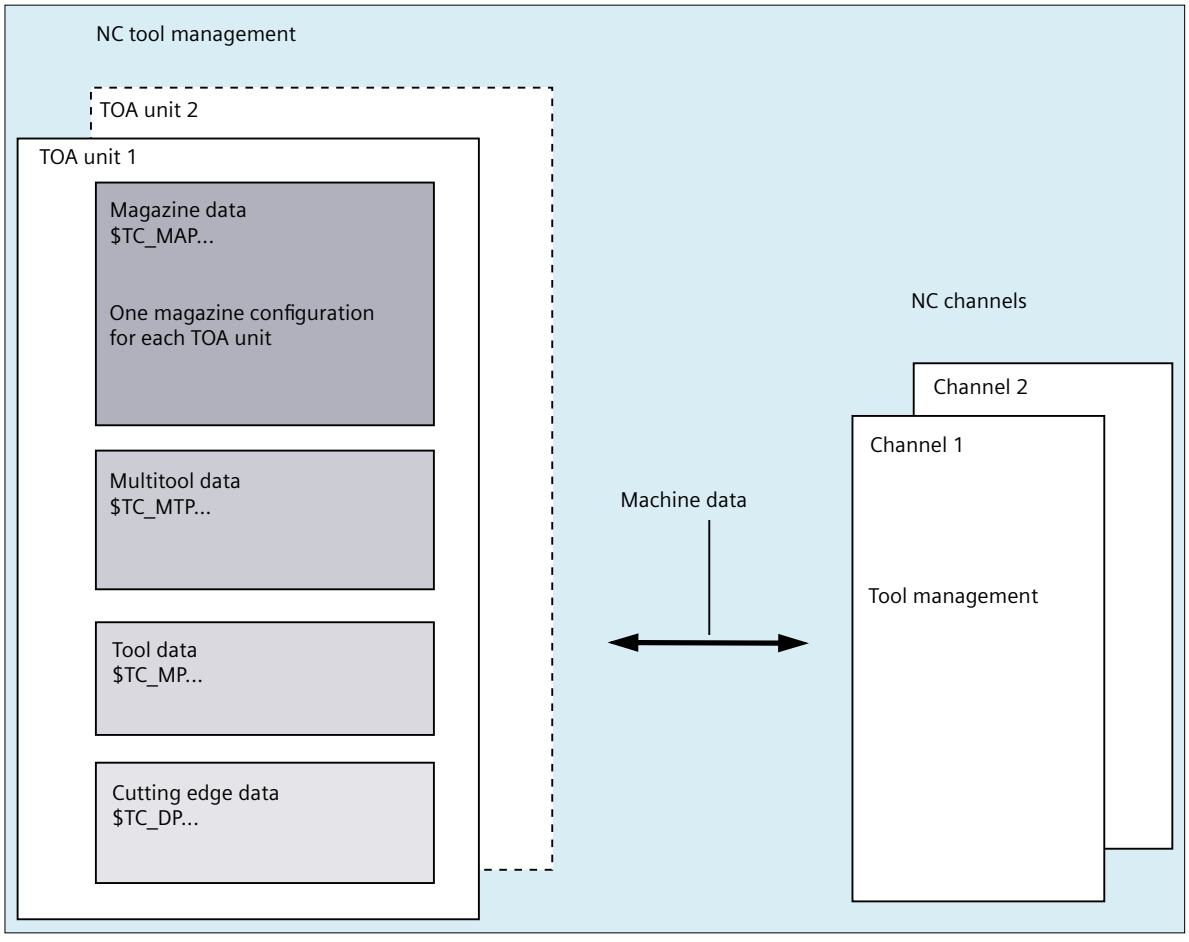


Figure 10-7 Interface signals for tool management functions from the channel

10.2.8.1 Change signals TM functions

Table 10-520 DB5300.DBX0000.0, tool prewarning limit reached

DB5300.DBX0000.0	**Tool prewarning limit reached** **Signals from channel: NC → PLC**	
Edge evaluation: Yes	Signal updated: cyclic	
Edge change 0 → 1	The prewarning limit for a tool to be monitored has been reached. The T number is provided in DB5300.DBD1000.	
Edge change 1 → 0	No prewarning limit reached.	
More information	• Function Manual SINUMERIK 828D Tools	

Table 10-521 DB5300.DBX0000.1, tool limit value reached

DB5300.DBX0000.1	**Tool limit value reached** **Signals from channel: NC → PLC**	
Edge evaluation: Yes	Signal updated: Job-controlled from the NC	
Edge change 0 → 1	The limit value for a tool to be monitored has been reached. The T number is provided in DB5300.DBD1004.	
Edge change 1 → 0	No limit value reached.	
More information	• Function Manual SINUMERIK 828D Tools	

10.2.8.2 Transferred TOOLMAN functions

Table 10-522 DB5300.DBD1000, T number for tool prewarning limit

DB5300.DBD1000	**T number for tool prewarning limit** **Signals from channel: NC → PLC**	
Edge evaluation: Yes	Signal updated: Job-controlled from the NC	
Edge change 0 → 1	The T number is provided for which the tool prewarning limit is set.	
Edge change 1 → 0	No tool number signaled.	
More information	• Function Manual SINUMERIK 828D Tools	

Table 10-523 DB5300.DBD1004, T number for tool limit value

DB5300.DBD1004	**T number for tool limit value** **Signals from channel: NC → PLC**	
Edge evaluation: Yes	Signal updated: Job-controlled from the NC	
Edge change 0 → 1	The T number is provided for which the tool limit value is set.	
Edge change 1 → 0	No tool number signaled.	
More information	• Function Manual SINUMERIK 828D Tools	

Appendix

A

A.1 List of abbreviations

A	
A	Output
AFIS	Automatic Filter Switch: Automatic filter switch
ASCII	American Standard Code for Information Interchange: American coding standard for the exchange of information
ASIC	Application Specific Integrated Circuit: User switching circuit
ASUP	Asynchronous subprogram
AUTO	Operating mode "Automatic"
AUXFU	Auxiliary Function: Auxiliary function
AWL	Statement list

B	
BAG	Mode group
BCD	Binary Coded Decimals: Decimal numbers encoded in binary code
BICO	Binector Connector
BIN	Binary Files: Binary files
BKS	Basic coordinate system
BM	Operating alarm
BO	Binector Output
BTSS	Operator panel interface

C	
CLC	Clearance control
CNC	Computerized Numerical Control: Computerunterstützte numerische Steuerung
COM	Communication
CP	Communication Processor
CPU	Central Processing Unit: Central processing unit
CST	Configured Stop: Configured stop

D	
DDS	Drive Data Set: Drive data set
DIR	Directory: Directory
DO	Drive Object
DRF	Differential Resolver Function: Differential resolver function (handwheel)

D	
DRY	Dry Run: Dry run feedrate
DWORD	Double word (currently 32 bits)

E	
E	Input
EES	Execution from External Storage
E/A	Input/Output
ESR	Extended stop and retract
ETC	ETC key ">"; Softkey bar extension in the same menu

F	
FDD	Feed Disable: Feed disable
FdStop	Feed Stop: Feed stop
FIFO	First In First Out: Memory that works without address specification and whose data is read in the same order in which they was stored
FM	Error message
FUP	Control system flowchart (PLC programming method)
FW	Firmware

G	
GEO	Geometry, e.g. geometry axis
GP	Basic program (PLC)
GUD	Global User Data: Global user data

H	
HEX	Abbreviation for hexadecimal number
HiFu	Auxiliary function
HMI	Human Machine Interface: SINUMERIK user interface
HSA	Main spindle drive
HT	Handheld Terminal
HW	Hardware

I	
IBN	Commissioning
INC	Increment: Increment
INI	Initializing Data: Initializing data
IPO	Interpolator

J	
JOG	JOGging: Setup mode

K	
KOP	Ladder diagram (PLC programming method)

L	
LED	Light Emitting Diode: Light-emitting diode
LMS	Position measuring system
LR	Position controller

M	
Main	Main program: Main program (OB1, PLC)
MCP	Machine Control Panel: Machine control panel
MD	Machine Data
MDA	Manual Data Automatic: Manual input
MDS	Motor Data Set: Motor data set
MELDW	Message word
MKS	Machine coordinate system
MM	Motor Module
MPF	Main Program File: Main program (NC)
MPI	Multi Point Interface
MSTT	Machine control panel

N	
NC	Numerical Control: Numerical control with block preparation, traversing range, etc.
NCU	Numerical Control Unit: NC hardware unit
NCK	Numerical Control Kernel
NCSD	NC Start Disable
NST	Interface signal
NV	Work offset
NX	Numerical Extension: Axis expansion module

O	
OB	Organization block in the PLC
OEM	Original Equipment Manufacturer
OP	Operation Panel: Operating equipment

P	
PCU	PC Unit: PC box (computer unit)
PG	Programming device
PI	Program instance
PLC	Programmable Logic Control: Controller
PN	PROFINET
PO	Power On
POS	Position/positioning
PPO	Parameter process data object: Cyclic data telegram for PROFIBUS DP transmission and "Variable speed drives" profile
PPU	Panel Processing Unit (central hardware for a panel-based CNC, e.g. SINUMERIK 828D)
PROFIBUS	Process Field Bus: Serial data bus
PRT	Program test
PTP	Point to Point: Point-to-point
PZD	Process data: Process data part of a PPO

R	
REF	REFerence point approach function
REPOS	REPOSition function
RESU	Retrace support
RID	Read In Disable
RP	R Parameter, arithmetic parameter, predefined user variable

S	
SA	Synchronized action
SBL	Single Block: Single block
SBT	Safe Brake Test
SCC	Safety Control Channel
SCL	Structured Control Language
SD	Settingdatum or setting data
SDI	Safe Direction
SERUPRO	Search-Run by Program Test: Block search via program test
SIC	Safety Info Channel
SKP	Skip: Function for skipping a part program block
SLP	Safe Limited Position
SLS	Safely Limited Speed
SMI	Sensor Module Integrated
SOS	Safe Operating Stop
SPF	Sub Program File: Subprogram (NC)
SS1	Safe Stop 1
SS2	Safe Stop 2
STO	Safe Torque Off

S	
STW	Control word
SUG	Grinding wheel peripheral speed
SW	Software

T	
TCU	Thin Client Unit
TIA	Totally Integrated Automation
TM	Terminal Module (SINAMICS)
TO	Tool Offset: Tool offset
TOA	Tool Offset Active: Identifier (file type) for tool offsets
TOFF	Online tool length offset
TRANSMIT	Transform Milling Into Turning: Coordination transformation for milling operations on a turning machine

U	
UP	Subprogram
USB	Universal Serial Bus

V	
VDI	Internal communication interface between NC and PLC

W	
WKS	Workpiece coordinate system
WPD	Work Piece Directory: Workpiece directory
WZ	Tool
WZV	Tool management

Z	
ZSW	Status word (of drive)

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