

SIEMENS

SINUMERIK 840D sl

Base software and HMI sl

Commissioning Manual

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HMI sl (IM9)

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Valid for

control system
SINUMERIK 840D sl/840DE sl

Software
NCU system software for 840D sl/840DE sl
with HMI sl

Version
2.5
2.5

01/2008
6FC5397-1DP10-3BA0

Safety Guidelines

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

 DANGER
indicates that death or severe personal injury will result if proper precautions are not taken.
 WARNING
indicates that death or severe personal injury may result if proper precautions are not taken.
 CAUTION
with a safety alert symbol, indicates that minor personal injury can result if proper precautions are not taken.
CAUTION
without a safety alert symbol, indicates that property damage can result if proper precautions are not taken.
NOTICE
indicates that an unintended result or situation can occur if the corresponding information is not taken into account.

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

Qualified Personnel

The device/system may only be set up and used in conjunction with this documentation. Commissioning and operation of a device/system may only be performed by **qualified personnel**. Within the context of the safety notes in this documentation qualified persons are defined as persons who are authorized to commission, ground and label devices, systems and circuits in accordance with established safety practices and standards.

Prescribed Usage

Note the following:

 WARNING
This device may only be used for the applications described in the catalog or the technical description and only in connection with devices or components from other manufacturers which have been approved or recommended by Siemens. Correct, reliable operation of the product requires proper transport, storage, positioning and assembly as well as careful operation and maintenance.

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Disclaimer of Liability

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

Preface

Preface

SINUMERIK Documentation

The SINUMERIK documentation is available in three versions:

- General Documentation
- User Documentation
- Manufacturer/Service Documentation

An overview of publications, which is updated on a monthly basis and provides information about the language versions available, can be found on the Internet at:

<http://www.siemens.com/motioncontrol>

Follow menu items "Support" → "Technical Documentation" → "Ordering Documentation" → "Printed Documentation".

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

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

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

<http://www.siemens.com/motioncontrol> under menu item "Support".

Target group

This documentation is intended for commissioning personnel.

The plant/product is installed, connected, and ready to start. The Commissioning Manual should contain all necessary information about or at least references to subsequent procedures such as testing the cabling, power on and functional testing.

Benefits

The intended target group can use the Commissioning Manual to test and commission the product/system correctly and in total safety.

Utilization phase: Setup and commissioning phase

Standard scope

This documentation describes the functionality of the standard scope. Extensions or changes made by the machine manufacturer are documented by the machine manufacturer.

Other functions not described in this documentation might be executable in the control. However, no claim can be made regarding the availability of these functions when the equipment is first supplied or in the event of servicing.

Furthermore, for the sake of clarity, this documentation does not contain all detailed information about all types of the product and cannot cover every conceivable case of installation, operation or maintenance.

Hotline

If you have any technical questions, please contact our hotline:

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Fax	+49 180 5050 223
Internet	http://www.siemens.com/automation/support-request

	America
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Fax	+1 423 262 2200
Email	mailto:techsupport.sea@siemens.com

	Asia / Pacific
Phone	+86 1064 719 990
Fax	+86 1064 747 474
Email	mailto:adsupport.asia@siemens.com

Note

National phone numbers for technical support are provided under the following Internet address:

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

Calls are subject to charge, e.g. €0.14/min on the German landline network. Tariffs of other phone providers may differ.

Questions about this documentation

If you have any queries (suggestions, corrections) in relation to this documentation, please send a fax or email to the following address:

Fax	+49 9131- 98 63315
Email	mailto:docu.motioncontrol@siemens.com

A fax form is available at the end of this document.

SINUMERIK Internet address

<http://www.siemens.com/sinumerik>

SIEMENS

SINUMERIK 840D sl

HMI sl (IM9)

Commissioning Manual

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System overview

Overview

The HMI sl V2.5 software is an integral component of the NCU V2.5 software and can thus run on the NCUs 7x0.2.

Visualization and operation is handled via a SINUMERIK operation panel (e.g., OP 012, TP 015AT, OP 08T, HT 8), which is connected via TCU (Thin Client Unit) to the NCU (Numerical Control Unit).

The HMI sl software's default data carrier is the NCU's CompactFlash Card.

The HMI sl software is started automatically when the NCU software starts up and in the delivery state offers its standard functional scope, which depends on the current NC and PLC configuration.

This Commissioning Manual describes the possible functional expansions and adjustments that the machine manufacturer can make using the HMI sl software.

For a more detailed description of the commissioning procedure for the SINUMERIK 840D sl, please refer to the following documentation:

Reference

Commissioning Manual, CNC: NCK, PLC, Drive

Prerequisites

2.1 Hardware/Software

It is a requirement that all system components be fully mounted, installed and configured.

Commissioning of the NC and PLC must have been completed. The PLC is in the "Run" condition.

- USB keyboard: handles text input with capital and lower-case letters.
- Storage medium, e.g. USB FlashDrive and/or network connection: handles data exchange with an external PC/PG.
- TextPad text editor: handles external creation and editing of XML and ini files in Windows. The program is available on the Internet at: <http://www.textpad.com/>
- WinSCP: enables protected data transfer between different computers. The program is available on the Internet at: <http://winscp.net/eng/docs/kang:de>

Principles of start-up

3.1 Data structure on the CompactFlash card

For HMI sl, all files are stored on the CompactFlash card. The file system of HMI sl consists at the top level of four directories "Siemens", "Add_on", "OEM", and "User".

These directories have essentially an identical structure.

The files in the "siemens" directory represent the original status and cannot be modified!

To modify files, copy the original file from the Siemens directory and paste it into the appropriate place in the "OEM" or "User" directory.

There are also sample files in the Siemens directory that you can copy and use as user-specific files.

Structure

The section of the directory structure on the CompactFlash card that is relevant for HMI sl is depicted below:

```

/Siemens/sinumerik
  /hmi
    /appl.cfs           // Applications (operating areas)
    /base.cfs           // Basic system
    /cfg                // All config files for runtime
    /data/              // Version data for the software and hardware
    /hlps/hlp_std.cfs  // Online help of the applications for standard
                        languages
    /hlps/hlp_xxx      // Online help of the applications for special
                        languages
    /ico/ico640         // Icons in resolution 640x480
    /ico/ico800         // Icons in resolution 800x600
    /ico/ico1024        // Icons in resolution 1024x768
    /ico/ico1280        // Icons in resolution 1280x1024
    /lngs/baselng_std.cfs // Texts of the basic system (standard languages)
    /lngs/baselng_ex1.cfs // Texts of the basic system (special languages 1)
    ...                // Texts of the basic system in additional
                        languages
    /lngs/appllng_std.cfs // Texts of the applications (standard languages)
    /lngs/appllng_ex1.cfs // Texts of the applications (special languages 1)
    ...                // Texts of the applications in additional

```

3.1 Data structure on the CompactFlash card

```
languages
... // Online help of the applications for additional
languages
/osal/qt.cfs // Qt
/osal/ace.cfs // ACE/TAO
/hlp // Online help for runtime
    /deu // Online help in German
        /hmi // Directory for HMI online help in German
            /hmi.xml
                ... // Directories for additional books
                    /eng // Online help in English
                        /hmi // Directory for HMI online help in English
                            /hmi.xml
                                ... // Directories for additional help books
hlp. // Directories for additional languages
/squish // Directories for squish components for test
// Note the following:
// At runtime, the config files are linked from base.cfs and appl.cfs to /cfg
// At runtime, the files are linked with the language-dependent texts to /lng
// At runtime, the files of the online help are linked to /hlp
```

```
/Add_on/sinumerik
    /hmi
        /addon1.cfs // Addon1 (everything except texts and online help)
        /addon2.cfs // Addon2 (everything except texts and online help)
        ... // Additional add-ons
        /lngs/addon1lng_std.c // Language-dependent texts Addon1
        fs
        /lngs/addon2lng_std.c // Language-dependent texts Addon2
        fs
        ... // Language-dependent texts of other add-ons
        /hlps/addon1hlp_std.c // Online help Addon1
        fs
        /hlps/addon2hlp_std.c // Online help Addon2
        fs
        ... // Online help additional add-ons
        /ico/ico640 // Icons in resolution 640x480
        /ico/ico800 // Icons in resolution 800x600
        /ico/ico1024 // Icons in resolution 1024x768
        /ico/ico1280 // Icons in resolution 1280x1024
        /appl // Binaries for runtime
        /cfg // Config files for runtime
        /lng // Language-dependent texts for runtime
        /hlp // Online help for runtime (see above)
// Note the following:
```

```

// At runtime, the binaries from addon1.cfs, addon2.cfs are linked to /appl.
// At runtime, the config files are linked from addon1.cfs and addon2.cfs to /cfg.
// At runtime, the files are linked with the language-dependent texts to /lng
// At runtime, the files of the online help are linked to /hlp

/OEM/sinumerik
  /hmi
    /oem1.cfs           // OEM1 (everything except texts and online help)
    /oem2.cfs           // OEM2 (everything except texts and online help)
    ...                 // Additional OEMs
    /lngs/oemlng_std.cfs // Language-dependent texts OEM1
    /lngs/oem2lng_std.cfs // Language-dependent texts OEM2
    ...                 // Language-dependent texts of other OEMs
    /hlps/oem1hlp_std.cfs // Online help OEM1
    /hlps/oem2hlp_std.cfs // Online help OEM2
    ...                 // Online help additional OEMs
    /ico/ico640         // Icons in resolution 640x480
    /ico/ico800         // Icons in resolution 800x600
    /ico/ico1024        // Icons in resolution 1024x768
    /ico/ico1280        // Icons in resolution 1280x1024
    /appl               // Binaries for runtime
    /cfg                // Config files for runtime
    /lng                // Language-dependent texts for runtime
    /hlp                // Online help for runtime (see above)
  /data
    /archive            // Manufacturer archive
    /cc                 // Compile cycles

```

```
/User/sinumerik
  /hmi
    /dh
    user // user (everything except texts and online
          help)
    /ico/ico640 // Icons in resolution 640x480
    /ico/ico800 // Icons in resolution 800x600
    /ico/ico1024 // Icons in resolution 1024x768
    /ico/ico1280 // Icons in resolution 1280x1024
    /appl // Binaries for runtime
    /cfg // Config files for runtime
    /lng // Language-dependent texts for runtime
    /hlp // Online help for runtime (see above)
    /data
  /data // User memory on CF card
    /archive // Manufacturer archive
    /prog
      /wks.dir/*.wpd
      /mpf.dir
      /spf.dir
      /*.dir
```

3.2 Editing files

3.2.1 Editing files in HMI sl

Use a copy of the original file to make specific adjustments.

The original file is stored on the CompactFlash Card in the "Siemens" directory.

Store the modified file in the appropriate folder of the "User" or "OEM" directory.

Note

You need to restart HMI sl for the settings made in the file to take effect.

Requirement

In order to copy files, you need access rights for protection level 1 (password: Machine manufacturer).

If you want to access the "System data" folder in the data tree, you need access rights for protection level 0 (password: System)

Copying / inserting / opening a file



1. Select the "Startup" operating area.



2. Press the "System data" softkey.
The data tree is displayed.



3. Open the required directory (e.g. CF-Card/Siemens/sinumerik/hmi/cfg) in the "CF Card" directory under "Siemens".
4. Position the cursor on the desired file.
5. Press the "Copy" softkey.
6. Open the directory to which you wish to save the copied file (e.g. CF-Card/User/sinumerik/hmi/cfg) in the "CF Card" directory under "User".



7. Press the "Paste" softkey.
If a file of the same name already exists, you receive a message. You can overwrite or rename the file.



8. Press the "OK" softkey.



9. To open the selected file in the editor, Press the "Open" softkey.

- OR -



Press the "INPUT" key.

- OR -

Double-click the highlighted file.

3.2.2 Editing a file externally

To create or edit an XML file on an external PC with Windows, use a text editor such as "TextPad". The "TextPad" text editor supports the "UTF-8" encoding required for the XML file.

Saving the XML file in UTF-8 coding

1. Select the "Save As" dialog box.
2. Set the character set to "UTF-8".

Entering comments in an XML file

If you are entering comments to explain a program, you must keep the following in mind:

- A comment always begins with the sequence: <!--
- A comment ends with the sequence -->

Example

```
<!-- Work offset: -->
```

Note

In the comment itself, you can never use two minus signs one right after the other!

Entering comments in an ini file

If you enter a comment in an ini file, start the comment line with a semicolon.

Copying a file with "WinSCP"

Use the "WinSCP" program to copy the file from an external computer to the NCU via a network connection.

For a detailed description, see the following documentation:

References

NCU Operating System (IM7): Backing up and restoring data and WinSCP and PuTTY service tools

See also

Create alarm attribute file (Page 135)

Protection levels

Access to programs, data and functions is user-oriented and controlled via eight hierarchical protection levels. These are divided into

- Four password levels for system, machine manufacturer, commissioning engineer and end user
- Four keyswitch positions for end user

There are protection levels 0 to 7 (see table below); where

- 0 is the highest and
- 7 is the lowest level.

Access rights

Table 4-1 Protection levels concept

Protection level	Protected by	Area
0	Password	System
1	Password: SUNRISE (default)	Machine manufacturer
2	Password: EVENING (default)	Service
3	Password: CUSTOMER (default)	end user
4	Keyswitch 3	Programmer, machine setter
5	Keyswitch 2	Qualified operator
6	Keyswitch 1	Trained operator
7	Keyswitch 0	Semi-skilled operator

4.1 Modifying the protection level password

You can activate the protection levels used with passwords via the user interface.

The following options are available for editing the passwords:

- Set new password
- Change password
- Delete password

Password Set



1. Select the "Startup" operating area.
2. Press the "Password" softkey.
3. Press the "Set password" softkey.
The "Set Password" window appears.
4. Enter one of the possible default passwords and press the "OK" softkey to confirm the entry.
A permissible password is set and the valid protection level is displayed. Invalid passwords will be rejected.

Change password

You must change the standard passwords to obtain a secure access protection.



1. Press the "Change password" softkey.
The "Change Password" window appears.
2. Select the area (e.g. user) for which you want to assign a new password.
3. Enter the new password in the input fields "New password" and "Repeat password."
4. Press the "OK" softkey to confirm your entry.
A new, valid password is only accepted if the two terms entered are identical.

Delete password



Press the "Delete password" softkey. The access authorization is reset.

Access authorization is not automatically deleted at POWER ON!

NOTICE
When a general reset is performed on the NCK, the default passwords are restored.

Licensing

Licenses are required for the activated options. When you purchase licenses you receive a "license key" containing all options requiring a license and which is only valid for your CF card.

Requirement

In order to set or reset options, you need access rights for protection level 1 (password: Machine manufacturer).

Procedure:



1. Select the "Startup" operating area.



2. Press the menu forward key.



3. Press the "Licenses" softkey.

The "Licensing" window appears and you can select the following with the vertical softkeys:

- Determining the license requirement
- Exporting licensing requirements
- Entering or reading in "License Key"

The licenses are purchased via the Internet. There are two ways to access the license database administered by Siemens A&D:

- Web License Manager
- Automation License Manager

For a detailed description, please refer to the following documentation:

References

CNC Commissioning Manual: NCK, PLC, Drives, in Section: Licensing

5.1 Determining the license requirement

Procedure



1. Press the "All options" softkey to list all the options that can be selected for this control.
2. Activate or deactivate the required options in the "Set" column:
 - Activate checkbox or
 - Enter the number of options

Options shown red are activated, however, not yet licensed or not licensed in adequate number.

- OR -



Press the "Missing licenses" softkey to display all options that are activated but not licensed.

In the column "Set" you can deselect the options that you do not require again.



3. To activate new selected options, press the "Reset (po)" softkey. A safety query will appear.

With HMI options, you will need to restart HMI sl. Corresponding prompts will appear in the user response line.



4. Press the "OK" softkey to trigger a warm restart.

- OR -



Press the "Cancel" softkey to cancel the process.

Note

Use of non-licensed options

Before licensing options, you can also activate them temporarily without the license keys and use them for test purposes. In this case, the control displays alarm 8080 periodically, indicating that the option use has not yet been assigned the required license

5.2 Exporting the license requirement

After you have determined the license requirement, you can export the data via the set-up external storage locations.

Procedure

A rectangular button with a light blue background and a dark blue border. The text "Exp. license requirement" is written in a bold, sans-serif font, with "Exp. license" on the top line and "requirement" on the bottom line.

1. Press the "Export license requirement" softkey.
A small window opens listing the set-up storage locations.
2. Select "USB" for example, if you export the licenses on a USB FlashDrive.

If you use the Automation License Manager (expansion module as of V1.2 SP1), you must store the data in the root directory.

A rectangular button with a light blue background and a dark blue border. It features a green checkmark icon above the text "OK" in a bold, sans-serif font.

3. Press the "OK" softkey.

The set options, the license requirement and the license key are stored in an Alm file. This file is used by the "automation license manager" as the basis for licensing.

Transferring a license requirement

The license information is transferred electronically with the "automation license manager".

A detailed description of the license management is provided in the following documentation:

References

CNC Commissioning Manual: NCK, PLC, Drive, in Section: Licensing

5.3 Reading in the license key

The newly purchased license key can be loaded to the controller as follows:

- Enter license key manually
- Read in license key electronically

Procedure



1. Press the "Licenses" softkey.

- OR -



Press the "Overview" softkey.

The "Licensing" window opens.

2. If you receive the license key via the Web License Manager, enter the license key manually in the field "You can enter a new license key here".



3. Press the "Input" key.

If the license key is valid, the message "License key set" is displayed.

- OR -



If you receive the license key via the Automation License Manager, press the "Read in license key" softkey.



Open the appropriate storage location (e.g. USB) with "OK".

The matching Alm file is detected automatically and the license key is read in.

Note:

If several matching Alm files are in the directory, they will be offered to you in a subsequent selection dialog box.

Select the desired file.

Creating drive connections

Set up connections

Up to eight connections to logical drives (data carriers) can be configured in HMI sl. These drives can be accessed in the "Program manager" and "Startup" operating areas.

The following logical drives can be set up:

- USB interface
- CompactFlash card of the NCU. The dialog box is available as of protection level 3 (password: End user).
- Network drives



Software options

- You need the "Additional 256 MB HMI user memory on CF card of NCU" option in order to be able to use the CompactFlash card as data carrier.
- To set up network drives, you need the "Network drive management" option.

Note

It is not possible to configure NCU or PCU interfaces.

6.1 Setting up drives

You can define logical drives in the "Set Up Drives" window.

A user interface for the configuration is available in the "Startup" operating area. The configuration data created from this is stored in the "logdrive.ini" file.

This file is located on the CompactFlash card in the User/sinumerik/hmi/cfg directory.

USB local/USB global

If you configure a "USB local" type of connection, you will only have access via the TCU to which the USB memory medium is connected.

With the "USB global" type of connection, you have access to the USB memory medium via all TCUs located on the system network.

The following settings are made when configuring a logical drive:

General settings

The following settings apply to all types of connection.

- Access level

The access rights to the connections can be assigned from protection level 7 (keyswitch position 0) to protection level 1 (password: Manufacturer). If nothing is entered here, the default setting protection level 7 (keyswitch position 0) applies.

The assigned protection level applies to all operating areas.

- Softkey text

Two lines are available for labeling softkeys in the "Program manager" operating area. %n is accepted as a line separator.

If the first line is too long, it is wrapped automatically. If there is a blank, it is used as a line separator.

- Softkey icon

Selection of the file name of the icon, that is to be displayed on the softkey.

Specific settings

The following settings will need to be made in accordance with the type of connection:

- No drive

No drive is specified for this connection, and no other fields are displayed.

- USB local (TCU that is currently selected)

- Connection

Enter the port to which the USB memory medium is connected on the TCU:

- Front (front of the operator panel)

- X203 (rear of the operator panel)

- X204 (rear of the operator panel)

- Partition

If required, enter the number of the partition on the USB memory medium here, e.g. 2. If a USB hub is being used at the USB port, enter the USB port that is accommodating this hub.

- Path
Enter the required start directory of the memory medium here.
- USB global (TCU)
 - Device
Enter the name of the TCU to which the USB storage device is connected here, e.g. tcu1. The NCU must already know the TCU name.
The remaining settings are the same as in the "USB local" section.
- Windows network (option)
 - Path
Enter the network path for a directory that is available on the network here. This path must always start with //, e.g. //Server01/Part programs.
 - User name and password
Enter the user name and the corresponding password for which the directory is enabled on the server here. The password is displayed in encoded form as a string of * characters and is stored in the logdrive.ini file in this format.
- Local drive (option)
 - Path
Enter the required directory on the local data carrier here.

Procedure



1. Select the "Startup" operating area.



2. Press the "HMI" and "Log. drive" softkeys.
The "Set Up Drives" window opens.



3. Select the type, connection, access level and softkey icon, then enter the path, partition, softkey text, text file and text context.



4. Press the "OK" softkey.
The drive is configured.

6.2 File "logdrive.ini"

Structure of the "logdrive.ini" file

- You define all logical drives in section [CONNECTIONS].
- You can enter the number of logical drives next to "ConnectionNum."

The following settings are possible for each logical drive:
 (The "X" at the end must be replaced in each case with the number of the drive connection.)

ConnectionX	Logical path of the drive, e.g. //my computer/my path
UsernameX	User name (for network drives)
PasswordX	Password belonging to UsernameX
SK_ConnectionX	Enter softkey text
NetDriveTypeX	Network connection type, e.g. NFS, SMBFS
SoftkeyIndexX	Softkey position on the horizontal softkey bar. <ul style="list-style-type: none"> • Index 1-8 is the first ETC level, • Index 9-16 second level, etc.
SoftkeyPictureX	Name of the file with the icon displayed on the softkey.
AccessServicesX	Access authorizations for the Program manager area

Drive paths

Use the following syntax to identify the drive paths:

Logical drive	Description
//NC/MPF.DIR/XY.DIR/TEST.MPF	Current NC
/card/user/sinumerik/data	Local drive on the CompactFlash Card (Linux)
//TCU/<tcu name>/X203	Global TCU-USB drive
//TCU/mytcu/X203,1	Global TCU-USB drive with partition specification (default: 1st partition)
//ACTTCU/FRONT,1	Local TCU-USB drive with partition specification
//ef3307/MPF.DIR/xy.DIR/TEST.MPF	External network drives (WinXP)
//ef3307/MPF.DIR	Network drive //networkname/myshare

Note

You must restart HMI sl in order to incorporate new entries and changes.

Sample structure of the logdrive.ini

Standard configuration

- The standard softkey is in the position HSK 3 (position 3 on the horizontal softkey bar).
- The softkey text is called "USB." Text is read from the text file.
- The icon sk_usb_front.png is displayed.
- The softkey is visible as of access authorization: protection level 7 (key-operated switch position 0) in the "Program manager" area.

```
[CONNECTIONS]
ConnectionNum=1
; local USB device of the current TCU
Connection1=//ACTTCU/FRONT,1
SK_Connection1=SL_PM_SK_LOCAL_TCU_USB
SoftkeyIndex1=3
SoftkeyTextContext1=SlPmLogicalDrives
SoftkeyTextFile1=slpmdialog
SoftkeyPicture1=sk_usb_front.png
AccessProgram1=7
AccessMachine1=7
AccessServices1=7
```

Configuring NFS drive

In the following example, a connection to the computer ef35161c is configured with an NFS network drive. The softkey with the text "LW_NFS" is located on the horizontal softkey bar in position 4.

```
Connection2=//ef35161c/testshare
NetDriveType2=nfs
SK_Connection2=LW_NFS
SoftkeyIndex2=4
```

In addition, you must release the NFS share for the client computer on the NFS server.

Configuring SMB drive

In the following example, a connection to the computer ef36557c is configured with an SMB network drive. The softkey with the text "LW_SMB" is located on the 2nd horizontal softkey bar in position 1. In addition, the user name and the associated password are required.

```
Connection3=// ef36557c /public
NetDriveType3=smbfs
Username3=test
Password3= Passwd02
SK_Connection3=LW_SMBFS
SoftkeyIndex3=9
```

In addition, you must set up an account on the Windows computer and release the folder (//ef36557c/public) for this account:

1. Properties/Release/Authorizations/Add...
2. Properties/Security/Add...

Note

Access to a Novell network is not allowed.

Configuring USB drive

In the following example, the USB plug "X203" is configured. The softkey with the text "X203" is located on the 2nd horizontal softkey bar in position 2.

```
Connection4=//TCU/TCU2/X203
SK_Connection4=x203
SoftkeyIndex3=10
```

Configuring a channel menu

7.1 Switching the TCU via a channel menu

A t:m configuration is a combination of operator station (t) and HMI sl system (m).

The switchover between the operator station with TCU to another HMI sl (and therefore to another TCU), or to another channel of the displayed HMI sl, is performed with the "Channel menu" function.

The TCU to which the switchover is to be made, is selected with the configured horizontal softkeys.

The channel on the TCU to which the switchover is to be made, is selected with the configured vertical softkeys.

All channel groups that are used on the system are configured in the "netnames.ini" file.

The version for the specific operator station is defined in the "config.ini" file.

Please refer to the following documentation for a detailed description of the configuration:

References:

Base Software and HMI Advanced Commissioning Manual, HMI Advanced (IM4), Section: Configuring a channel menu

Adapting the user interface

8.1 Change Language

The HMI sl software is available in six languages as standard:

You can set the selection method for the user interface language via a display machine data item.

Selecting first language

MD9100 \$MM_CHANGE_LANGUAGE_MODE

Language selection mode

= 1 The user-interface language is specified via the "Language Selection" window (default setting).



1. Select the "Startup" operating area.

2. Press the "Change language" softkey.

The small "Language Selection" window opens. The language most recently set is highlighted.



3. Switch the cursor to the required language.

4. Press the "INPUT" key.

- OR -



Press the "OK" softkey.
HMI sl switches to the language selected.

Selecting second language

MD9100 \$MM_CHANGE_LANGUAGE_MODE

Language selection mode

= 2 Selection of two languages. During operation, the "Change language" softkey can be used to toggle between these languages.



1. Select the "Startup" operating area.



2. Press the "HMI" softkey.



3. Press the ">>" softkey.



4. Press the "Language selection" softkey.
The "Language Selection" window opens.

All the installed languages are displayed in the fields "First language" and "Second language".



5. Select a language in each of these.

6. Press the "INPUT" key.

- OR -



Press the "OK" softkey.



During operation, you can switch between the two languages by pressing the "Change language" softkey.

See also

Principles of start-up (Page 11)

Configuring tool management (Page 81)

8.2 Setting the time and date

You can enter the date and time manually as well as select from among different display formats.

Procedure



1. Select the "Startup" operating area.



2. Press the "HMI" softkey.



3. Press the "Date/Time" softkey.
The "Set Date and Time" window opens.



4. Select the required formats for the date and time with the "Select" key in the "Format" field.

The following formats are available:

- Date:
D.M.YY
DD.MM.YY
DD.MM.YYYY
D/M/YY
DD/MM/YY
DD/MM/YYYY
M/D/YY
MM/DD/YY
MM/DD/YYYY
YYYY/MM/DD
- Time:
H:M:S AM/PM
H:M:S am/pm
HH:MM:SS AM/PM
HH:MM:SS am/pm
H:MM:SS AM/PM
H:MM:SS am/pm
H:MM:SS
HH:MM:SS



5. Confirm the entry with the "OK" softkey.
The new date and time details are accepted and output on the first line in the "current" fields.

Machine and setting data

9.1 Machine and setting data

Overview

As of NCU software version 2.5, the display machine and setting data is divided up as follows:

Prefix	Number ranges	Machine/setting data	Storage in range (softkey)
\$MM	9000 - 9999	Display machine data	Display MD
\$MNS	51000 - 51299	General configuration machine data	General MD
	51300 - 51999	General cycle machine data	
\$MCS	52000 - 52299	Channel-specific configuration machine data	Channel MD
	52300 - 52999	Channel-specific cycle machine data	
\$MAS	53000 - 53299	Axis-specific configuration machine data	Axis MD
	53300 - 53999	Axis-specific cycle machine data	
\$\$SNS	54000 - 54299	General configuration setting data	General SD
	54300 - 54999	General cycle setting data	
\$\$SCS	55000 - 55299	Channel-specific configuration setting data	Channel SD
	55300 - 55999	Channel-specific cycle setting data	
\$\$SAS	56000 - 56299	Axis-specific configuration setting data	Axis SD
	56300 - 56999	Axis-specific cycle setting data	

The new display machine and setting data is at the end of the respective range.

You can find the new machine and setting data in the following documentation:

References

Parameter Manual, Book 1

Detailed machine data

Changed display machine data

The display machine and setting data of NCU software version 2.4 has been assigned different names, prefixes and numbers in software version 2.5, or omitted completely.

Display machine data omitted for software version 2.5

Display MD/SD up to NCU SW 2.4	Display MD/SD as of NCU SW 2.5
\$MM_DISPLAY_RESOLUTION_RotaryAxisIn = 3	Omitted
TM_TOOL_MANAGEMENT=4	Omitted
USER_BEGIN_WRITE_RPA_1=0	Omitted
USER_BEGIN_WRITE_RPA_2=0	Omitted
USER_BEGIN_WRITE_RPA_3=0	Omitted
USER_CLASS_WRITE_RPA_1=7	Omitted
USER_CLASS_WRITE_RPA_2=7	Omitted
USER_CLASS_WRITE_RPA_3=7	Omitted
USER_END_WRITE_RPA_1=0	Omitted
USER_END_WRITE_RPA_2=0	Omitted
USER_END_WRITE_RPA_3=0	Omitted

Machine/setting data changed for software version 2.5

Display MD/SD up to NCU SW 2.4	Display MD/SD as of NCU SW 2.5
\$MM_DISPLAY_RESOLUTION = 3	MD51000 \$MNS_DISP_RES_MM
\$MM_DISPLAY_RESOLUTION_FeedPerRevolution = 3	MD51001 \$MNS_DISP_RES_MM_FEED_PER_REV
\$MM_DISPLAY_RESOLUTION_FeedPerTime = 3	MD51002 \$MNS_DISP_RES_MM_FEED_PER_TIME
\$MM_DISPLAY_RESOLUTION_FeedPerTooth = 3	MD51003 \$MNS_DISP_RES_MM_FEED_PER_TOOTH
\$MM_DISPLAY_RESOLUTION_ConstantCuttingSpeed = 0	MD51004 \$MNS_DISP_RES_MM_CONST_CUT_RATE
\$MM_ACT_VALUE_FONT_ZOOM_MODE=3	MD51010 \$MCS_DISP_NUM_AXIS_BIG_FONT
\$MM_DISPLAY_RESOLUTION_INCH = 4	MD51010 \$MNS_DISP_RES_INCH
\$MM_DISPLAY_RESOLUTION_INCH_FeedPerRevolution = 4	MD51011 \$MNS_DISP_RES_INCH_FEED_PER_REV
\$MM_DISPLAY_RESOLUTION_INCH_FeedPerTime = 4	MD51012 \$MNS_DISP_RES_INCH_FEED_PER_TIME
\$MM_DISPLAY_RESOLUTION_INCH_FeedPerTooth = 4	MD51013 \$MNS_DISP_RES_INCH_FEED_P_TOOTH
\$MM_DISPLAY_RESOLUTION_RotaryAxis = 3	MD51020 \$MNS_DISP_RES_ANGLE
\$MM_DISPLAY_RESOLUTION_SPINDLE = 0	MD51021 \$MNS_DISP_RES_SPINDLE
\$MM_ACTIVATE_SEL_USER_DATA=1	MD51025 \$MNS_FRAMES_ACT_IMMEDIATELY
\$MM_ACTIVATE_FRAME_CHANGES_AT_ONCE=1	MD51025 \$MNS_FRAMES_ACT_IMMEDIATELY
\$MM_AXES_SHOW_GEO_FIRST=1	MD51026 \$MNS_AXES_SHOW_GEO_FIRST
\$MM_ONLY_MKS_DIST_TO_GO=0	MD51027 \$MNS_ONLY_MKS_DIST_TO_GO
\$MM_BLOCK_SEARCH_MODE_MASK=51	MD51028 \$MNS_BLOCK_SEARCH_MODE_MASK
\$MM_MAX_SKP_LEVEL=1	MD51029 \$MNS_MAX_SKP_LEVEL
\$MM_SPIND_MAX_POWER=100	MD51030 \$MNS_SPIND_MAX_POWER

Display MD/SD up to NCU SW 2.4	Display MD/SD as of NCU SW 2.5
\$MM_SPIND_POWER_RANGE=100	MD51031 \$MNS_SPIND_POWER_RANGE
\$MM_STAT_DISPLAY_BASE=2	MD51032 \$MNS_STAT_DISPLAY_BASE
\$MM_TU_DISPLAY_BASE=2	MD51033 \$MNS_TU_DISPLAY_BASE
\$MM_TEACH_MODE=1	MD51034 \$MNS_TEACH_MODE
\$MM_WRITE_FRAMES_FINE_LIMIT=0.999	MD51035 \$MNS_WRITE_FRAMES_FINE_LIMIT
\$MM_COORDINATE_SYSTEM=0	MD51037 \$MNS_ENABLE_COORDINATE_ACS
\$MM_USER_CLASS_SHOW_SBL2=7	MD51044 \$MNS_ACCESS_SHOW_SBL2
\$MM_USER_CLASS_TEACH_IN=7	MD51045 \$MNS_ACCESS_TEACH_IN
\$MM_USER_CLASS_CLEAR_RPA=7	MD51046 \$MNS_ACCESS_CLEAR_RPA
\$MM_USER_CLASS_READ_GUD_LUD=7	MD51047 \$MNS_ACCESS_READ_GUD_LUD
\$MM_USER_CLASS_WRITE_GUD_LUD=7	MD51048 \$MNS_ACCESS_WRITE_GUD_LUD
\$MM_USER_CLASS_WRITE_PRG_CONDIT=7	MD51049 \$MNS_ACCESS_WRITE_PRG_COND
\$MM_USER_CLASS_WRITE_PROGRAM=7	MD51050 \$MNS_ACCESS_WRITE_PROGRAM
\$MM_USER_CLASS_WRITE_RPA=7	MD51051 \$MNS_ACCESS_WRITE_RPA
\$MM_USER_CLASS_WRITE_SEA=7	MD51052 \$MNS_ACCESS_WRITE_SEA
\$MM_USER_CLASS_WRITE_BASE_FRAME=7	MD51053 \$MNS_ACCESS_WRITE_BASEFRAME
\$MM_USER_CLASS_WRITE_CYCFRAME=7	MD51054 \$MNS_ACCESS_WRITE_CYCFRAME
\$MM_USER_CLASS_WRITE_EXTFRAME=7	MD51055 \$MNS_ACCESS_WRITE_EXTFRAME
\$MM_USER_CLASS_WRITE_PARTFRAME=7	MD51056 \$MNS_ACCESS_WRITE_PARTFRAME
\$MM_USER_CLASS_WRITE_SETFRAME=7	MD51057 \$MNS_ACCESS_WRITE_SETFRAME
\$MM_USER_CLASS_WRITE_TOOLFRAME=7	MD51058 \$MNS_ACCESS_WRITE_TOOLFRAME
\$MM_USER_CLASS_WRITE_TRAFRAME=7	MD51059 \$MNS_ACCESS_WRITE_TRAFRAME
\$MM_USER_CLASS_WRITE_USER_FRAME=7	MD51060 \$MNS_ACCESS_WRITE_USERFRAME
\$MM_USER_CLASS_WRITE_WPFRAME=7	MD51061 \$MNS_ACCESS_WRITE_WPFRAME
USER_CLASS_WRITE_TM_GEO=7	MD51200 \$MNS_ACCESS_WRITE_TM_GEO
USER_CLASS_WRITE_TM_WEAR=7	MD51201 \$MNS_ACCESS_WRITE_TM_WEAR
USER_CLASS_WRITE_TM_WEAR_DELTA=7	MD51202 \$MNS_ACCESS_WRITE_TM_WEAR_DELTA
USER_CLASS_WRITE_TM_SC=7	MD51203 \$MNS_ACCESS_WRITE_TM_SC
USER_CLASS_WRITE_TM_EC=7	MD51204 \$MNS_ACCESS_WRITE_TM_EC
USER_CLASS_WRITE_TM_SUPVIS=7	MD51205 \$MNS_ACCESS_WRITE_TM_SUPVIS
USER_CLASS_WRITE_TM_ASSDNO=7	MD51206 \$MNS_ACCESS_WRITE_TM_ASSDNO
USER_CLASS_WRITE_TM_MAG_WGROUP=7	MD51207 \$MNS_ACCESS_WRITE_TM_WGROUP
USER_CLASS_WRITE_TM_ADAPT=7	MD51208 \$MNS_ACCESS_WRITE_TM_ADAPT
USER_CLASS_WRITE_TM_NAME=0	MD51209 \$MNS_ACCESS_WRITE_TM_NAME
USER_CLASS_WRITE_TM_TYPE=0	MD51210 \$MNS_ACCESS_WRITE_TM_TYPE
USER_CLASS_READ_TM=7	MD51211 \$MNS_ACCESS_READ_TM
TM_WRITE_WEAR_ABS_LIMIT=0	MD51212 \$MNS_TM_WRITE_WEAR_ABS_LIMIT
TM_WRITE_WEAR_DELTA_LIMIT=0	MD51213 \$MNS_TM_WRITE_WEAR_DELTA_LIMIT
TM_WRITE_LIMIT_MASK=7	MD51214 \$MNS_TM_WRITE_LIMIT_MASK
TECHNOLOGY=1	MD52200 \$MCS_TECHNOLOGY
TM_OPTION_MASK=0	MD52270 \$MCS_TM_FUNCTION_MASK
TM_MAG_PLACE_DISTANCE=0	MD52271 \$MCS_TM_MAG_PLACE_DISTANCE

Display MD/SD up to NCU SW 2.4	Display MD/SD as of NCU SW 2.5
TM_TOOL_LOAD_DEFAULT_MAG=0	MD52272 \$MCS_TM_TOOL_LOAD_DEFAULT_MAG
TM_TOOL_MOVE_DEFAULT_MAG=0	MD52273 \$MCS_TM_TOOL_MOVE_DEFAULT_MAG
TM_DISPL_DIR_MAIN_SPIND_M3=0	MD53200 \$MAS_DISP_DIR_SPINDLE
\$MM_CHANGE_LANGUAGE_MODE=1	MD9100 \$MM_CHANGE_LANGUAGE_MODE
\$MM_SHOW_TOOL_TIP=0	MD9102 \$MM_SHOW_TOOL_TIP
\$MM_TOOLTIP_TIME_DELAY=1	MD9103 \$MM_TOOLTIP_TIME_DELAY
\$MM_MD_TEXT_SWITCH=0	MD9900 \$MM_MD_TEXT_SWITCH
\$MM_SW_OPTIONS=0	MD9990 \$MM_SW_OPTIONS
TM_OPTION_MASK2=0	SD54215 \$SNS_TM_FUNCTION_MASK_SET
TM_DEFAULT_DIR_TURN_TOOLS=3	SD55218 \$SCS_FUNCTION_MASK_TURN_SET Bit 0

9.2 Displaying/editing machine data

You can display and modify the following machine data in the "Startup" operating area.

- General machine data (\$MN and \$MNS)
- Channel-specific machine data (\$MC and \$MCS)
- Axis-specific machine data (\$MA and \$MAS)
- Drive-specific machine data (\$M_)
- Machine data control unit: Drive parameters
- Machine data feed-in: Drive parameters
- I/O component parameters: Drive parameters
- Communication parameters (CULINK, DMC): Drive parameters

Note

The display of the machine data/drive parameters depends on the configuration of your controller.

Access authorization to the machine data operating area can be controlled by keyswitch position or password.

Read access to machine data is possible as of protection level 4 (keyswitch 3).

Machine data can be changed as of protection level 1 (password: Machine manufacturer).

 **DANGER**

Changes in the machine data have a considerable influence on the machine. Incorrect configuration of the parameters can endanger human life and cause damage to the machine.

Information about machine data

The following information is displayed from left to right:

- Machine data number, with field index if applicable
- Machine data name
- Value of the machine data
- Unit of the machine data
- Effective

Note

If the machine data does not use units, the corresponding column is empty. If the data is not available, the "#" symbol is displayed instead of the value. If the value ends in an "H", it is a hexadecimal value.

The physical units of machine data are displayed on the right-hand side of the input field.

For each machine data item, an activation type can be read in the column on the right.

- so Immediately active: no action required
- cf Configuration: "Set MD to active" softkey
- re Reset: "Reset" key on the machine control panel
- po POWER ON: "NCK reset" softkey or reset of the HMI sl

Procedure



1. Select the "Startup" operating area.



2. Press the "Mach. data" softkey. Additional softkeys for the individual machine data areas are displayed.



3. Press the "General MD", "Channel MD", or "Axis MD" softkey. The window opens and the selected machine data is displayed.



- 4. Place the cursor on a machine data item.
- 5. Position the cursor on the entry to be modified and enter the required value.
- 6. Depending on the activation type, there are two ways of activating the settings:



Press the "Activate MD (cf)" softkey. The value is applied.

- OR -



Press the "Reset (po)" softkey.

A safety prompt appears.



7. Press the "OK" softkey to trigger a warm restart.

- OR -



Press the "Cancel" softkey if you do not want to apply the settings.

Axis selection

If several components are available for the area selected (e.g. "Axis MD"), you can choose from the following options:



1. Press the "Axis +" or "Axis -" softkey.
The values of the next (+) and the previous (-) axes are displayed.



- OR -



1. Press the "Direct selection..." softkey.
The "Direct Selection" window opens.

2. Select the required axis directly from those available in the drop-down list box.



3. Press the "OK" softkey to save the setting.

- OR -



1. Press the "Cancel" softkey to reject the settings.

9.3 Displaying/editing display machine data

You can access the display machine data via the user interface in the "Startup" operating area.

Procedure



1. Select the "Startup" operating area.



2. Press the "Mach. data" softkey.



3. Press the menu forward key.
Further softkeys are displayed.



4. Press the "Display MD" softkey.
The display machine data appears.

You will find additional display machine data in the various areas of the machine and setting data.

5. Position the cursor on the entry to be modified and enter the required value.



6. Press the "Reset (po)" softkey.
A safety prompt appears.



7. Press the "OK" softkey to trigger a warm restart.

- OR -



Press the "Cancel" softkey if you do not want to apply the settings.

9.4 Displaying/editing setting data

You can access the following setting data via the user interface in the "Startup" operating area.

- General setting data
- Channel-specific setting data
- Axis-specific setting data

Procedure



1. Select the "Startup" operating area.



2. Press the "Mach. data" softkey.



3. Press the menu forward key.
The softkeys "General SD", "Channel SD", and "Axis SD" are displayed.



4. Press the relevant softkey to display a particular setting data area.
The window opens and the selected setting data is displayed.



5. Place the cursor on the desired setting data and position the cursor on the entry to be changed. Enter the desired value.

6. Depending on the activation type, there are two ways of activating the settings:



Press the "Activate MD (cf)" softkey.

- OR -



Press the "Reset (po)" softkey.
A safety prompt appears.



7. Press the "OK" softkey to trigger a warm restart.

- OR -



Press the "Cancel" softkey if you do not want to apply the settings.

Axis selection

If several components are available for the area selected (e.g. "Axis SD "), you can choose from the following options:



1. Press the "Axis +" or "Axis -" softkey.

The values of the next (+) and the previous (-) axes are displayed.



- OR -



Press the "Direct selection..." softkey.

The "Direct Selection" window opens.

2. Select the required axis directly from those available in the drop-down list box.



3. Press the "OK" softkey to save the setting.

- OR -



Press the "Cancel" softkey to reject the setting.

9.5 Displaying/editing drive parameters

The "Control Unit MD", "Infeed MD" and "Drive MD" softkeys are available for the display and for the purpose of editing drive parameters.

A separate list display is provided for each of these areas in which you can view and edit drive data.

Requirement

Settings on drive parameters are protected with protection level 1 (password: Machine manufacturer).

Please refer to the following documentation for information about commissioning the drive parameters:

References

CNC Commissioning Manual: NCK, PLC, drives

Procedure



1. Select the "Startup" operating area.



2. Press the "Mach. data" softkey.
The softkeys "Control Unit MD", "Supply MD", and "Drive MD" are displayed.
3. Press the softkey of an area to show its parameters.

9.6 Machine data display filter

Through the use of the machine data display filter, it is possible to reduce the number of displayed machine data relating to a certain area, e.g. general machine data, for special purposes.

Machine data areas

Display filters are available for the following machine data areas:

- General machine data
- Channel-specific machine data
- Axis-specific machine data

- Drive machine data
- Display machine data

Filter options

It is possible to limit the machine data display using the following filtering methods:

- Filter according to indices
- Filter according to display groups
- Display expert parameters

Indices from ... to

The index filter refers to the machine data fields. On the display, this machine data can be identified by the field index attached to the machine data string.

Example: 10000[index]AXCONF_MACHAX_NAME_TAB

If the index filter is activated, machine data fields are only displayed in the specified index area.

Display groups

A display group contains machine data within a machine data area that belongs to the same topic.

Note

To find out which display group a machine data item belongs to, refer to the "Display filter" parameter associated with the description of the machine data element in question.

References: 840D sI Parameter Manual

Select/deselect display groups to increase or decrease the number of machine data items displayed for the current machine data area.

Display expert parameters

If the "Display expert parameters" filter is disabled, only the machine data in a machine data area that is required for the basic functionality of the NC is displayed.

Procedure



1. Select the "Startup" operating area.



2. Press the "Mach. data" softkey.



3. Press the softkey of a particular data area, e.g. "General MD".
The list of general machine data is displayed.



4. Press the "Display options" softkey.
The "Display Options: ..." window for the selected machine data opens.

5. Select the required filter options (according to display groups, indices or expert parameters) by activating the checkboxes.



6. Press the "Select all" softkey to activate all display groups.

- OR -



Press the "Deselect all" softkey.

All checkmarks are removed and you can select individual display groups.

9.7 Editing machine data and drive parameters

9.7.1 Editing hexadecimal values

You can use a bit editor to enter the required values for machine data in hexadecimal format.

Procedure



1. Select the "Startup" operating area.



2. Press the "Mach. data" softkey and select the required machine data area (e.g. general machine data).



3. Position the cursor on the entry to be edited.



4. Press the "SELECT" or "INSERT" key.

The "Bit Editor" window opens.

All bits of the machine data item that have a description text are displayed.

5. If you activate the "Display all bits" checkbox, all bits regardless of their data type (8, 16 or 32 bits) are displayed. Activate the relevant bit.



6. Press the "OK" softkey. The setting is checked and an error message may be output.

The window closes and you return to the machine data overview.

The new value is displayed in hexadecimal format.

9.7.2 Editing BICO values

You can use the BICO editor to enter BICO values for drive parameters.

Procedure



1. Select the "Startup" operating area.



2. Press the "Mach. data" softkey.



3. Select the area (e.g. Control Unit MD) where you want to edit the parameter.



4. Position the cursor on the entry to be edited.
5. Press the "SELECT" or "INSERT" key.
The "BICO Editor" window opens.
6. Complete the "Drive object number", "Parameter number", "Bit/Index" and "Parameter value (hex)" fields.

Note

The BICO editor also opens if you enter a value other than 0 or 1 for the value to be changed.

9.7.3 Editing enum values

You can use a drop-down list box to edit enum elements of drive parameters.

Procedure



1. Select the "Startup" operating area.



2. Press the "Mach. data" softkey.



3. Select the area (e.g. Control Unit MD) where you want to edit the parameter.



4. Position the cursor on the entry to be edited.
5. Press the "SELECT" or "INSERT" key.
A window containing a list of all defined enum values and their descriptions opens.

9.8 Searching for data

You can search for specific machine, setting and display machine data.

Search strategies

- When a digit or a digit with an index is entered, an exact search for this parameter is performed.
Example: If "9" is entered > p9 will be found (but not p99)
- When text is entered, a full-text search is performed: i.e. the term is sought in the relevant table and in the status bar.

Procedure



1. Select the "Startup" operating area.



2. Press the "Mach. data" softkey.



3. Select an area by pressing the relevant softkey.
4. Press the "Search..." softkey and enter the required text or digit in the search screen.

The cursor is positioned on the first entry that corresponds to the search term.



5. Press the "Continue search" softkey if this machine, setting or display machine data item is not the one you are looking for.

9.9 User views

In the "User Views" window you can create and adapt all machine data relevant to a particular functionality.

Machine data is individually collated to simplify the user's task.

You can include comments when creating and editing user views.

Note

Compatible views

If you have already created HMI-Advanced views, copy the *.klb files to /card/user/sinumerik/hmi/template/user_views to use them in HMI sl.

Person groups

Predefined user views can be created for the following person groups:

- Mechanical Assembly
- Electrical Assembly
- NC Optimization
- Drive Optimization

9.9.1 Creating a user view

Procedure



1. Select the "Startup" operating area and press the "Mach. data" softkey.



2. Press the "User Views", "Edit View", and "New View" softkeys. The "New View" window opens.



3. Enter a name for the view and press the "OK" softkey.



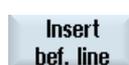
4. Press the "Enter data" softkey. The "Insert data" listbox opens.



5. Open the selection list with the "INSERT" key, select a machine data area and press the "INPUT" key.



6. Select a machine data item with the cursor keys or using the "Find" softkey.



7. Press the "Insert Before Line" or "Insert After Line" softkey to insert the selected machine data at the required position in the user view.



Note:

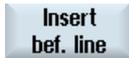
You can navigate in the open user view with the mouse and select a line without closing the listbox.



8. Press the "Back" softkey to close the listbox and return to the user view you want to edit.
Your entries are automatically stored.



9. Press the "Insert Text..." softkey to insert any text in the open user view.
The "Insert Text" input window opens.



10. Enter a text and explanatory description for the text and press the "Insert Before Line" or "Insert After Line" softkey to apply the text.



11. Press the "Back" softkey to save your entries and return to the user view you are editing.

Selecting a particular machine data item



You can use the Search dialog box to look for a particular data item.

9.9.2 Editing the user view

Depending on the row you have selected, you can use the "Properties" softkey to change comments and, in the case of machine data, the data source (channel, axis, drive unit).

- Machine data

Depending on the data type you can select either a fixed or a variable data source for machine data.

The entry "variable(*)" means that when you can select another data source (channel, axis, drive unit) with vertical softkeys 1- 3 (+, - and direct selection) the value displayed changes to refer to the data source currently selected.

Alternately, you can select a fixed data source so that the displayed value does not change when you select a different data source.

- Comment texts

Text and description

Procedure



1. Select the "Startup" operating area and press the "Mach. data" softkey.



2. Press the "User views" softkey.
The "User Views" window opens.



3. Press the "Select view" softkey and select the user view to be edited in the "View" list.



4. Select a machine data item with the cursor keys.



5. Press the "Up" or "Down" softkeys to move the selected row.



- OR -



Press the "Delete" Line" softkey to remove the selected line from the view.

- OR -



Press the "Properties..." softkey to modify the texts of comments or the unit of machine data (e.g. axis number, etc.).



6. Press the "Back" softkey to save your changes.

Selecting a particular machine data item



You can use the Search dialog box to look for a particular data item.

Customizing the "Machine" operating area

10.1 Setting the font size of the actual value display

The axis representation in the actual value window can be displayed in two different font sizes in the "Machine" operating area.

You define how many axes should be displayed in a larger font via a channel-specific configuration machine data item.

Configuring font size

MD52010 \$MCS_DISP_NUM_AXIS_BIG_FONT

= 3 Number of axes to be displayed in a larger font (default setting = 3)

Depending on the number of axes that are displayed in a larger font, the number of axes that are displayed in the overall view is reduced. If, for example, four axes are displayed in a larger font, only a total of five axes are displayed in the window.

10.2 Configuring the display of the G-code groups

The "G-functions" pane is visible in the "Machine" operating area.

Up to a maximum of 16 G-code groups are displayed in this pane. Configure the "sl_window_g_code.ini" file accordingly to determine which G-code groups should be displayed, and where.

Configuring G-code groups

Section	Meaning
Selected G groups	This area is intended for operation of the controller in Siemens mode.
Selected G groups ISO mode	This area is intended for operation of the controller in ISO mode.

Enter the G-code group and position as follows:

SelectedGGroupN = M	
N	Position where G-code group M will be displayed. If you want to leave a position empty, omit the number (M), e.g. "SelectedGGroup1 = "
M	The number of the G-code group to be displayed at position N

Structure of the file

```
[Selected G-Groups]
SelectedGGroup1 = 1
SelectedGGroup2 = 2
SelectedGGroup3 = 3
SelectedGGroup4 = 4
SelectedGGroup5 = 5
SelectedGGroup6 = 6
SelectedGGroup7 = 7
SelectedGGroup8 = 8
SelectedGGroup9 = 9
SelectedGGroup10 = 11
SelectedGGroup12 = 12
SelectedGGroup13 = 13
SelectedGGroup14 = 14
SelectedGGroup15 = 15
SelectedGGroup16 = 16

[Selected G-Groups ISO-Mode]
... (as with section for Siemens)
```

Procedure

1. Copy the "sl_window_g_code.ini" file from the following folder:
 /Siemens/sinumerik/hmi/cfg
2. Store the file in the following directory: /User/sinumerik/hmi/cfg
 As soon as the file is located in the user-specific directory, e.g. User or Oem, the entries for this file take precedence over the Siemens file. If an entry is missing in a user-specific file, the corresponding entry from the Siemens file is used instead.
3. Open the file and enter the number of the G code in question at the required position
 "SelectedGGroup1 = **5**".
 I.e. the 5th G code group will be displayed at the 1st position.

10.3 Status display

10.3.1 Setting TPM lights

The TPM lights are visible in the status bar of the "Machine" operating area.

Per default, the TPM lights are not visible and must be activated in the "slmahdconfig.ini" file.

You can change the default values and specify which light color is displayed for each value in the data block.

Entries in the "slmahdconfig.ini" file

Entries	Meaning
TPM	1 = Lights on 0 = Lights off (default)
TPMGreen	1 = Value of the data block for "green light" (default)
TPMYellow	2 = Value of the data block for "yellow light" (default)
TPMRed	3 = Value of the data block for "red light" (default)
TPMPLCData	Data block to be evaluated, e.g. DB59.DBB800

Procedure

1. Copy the "slmahdconfig.ini" file from the /**Siemens**/sinumerik/hmi/cfg directory.
2. Store the file in the /**Oem**/sinumerik/hmi/cfg or /**User**/sinumerik/hmi/cfg directory.
3. Open the file and make the required settings.

"slmahdconfig.ini" file

```
[TPM]  
TPM=0  
TPMGreen=1  
TPMYellow=2  
TPMRed=3  
TPMPLCData=DB59.DBB800
```

10.3.2 Inserting a user-specific logo

The SIEMENS logo is visible in the header of the "Machine" operating area.

You can replace the SIEMENS logo with your own logo.

Procedure

1. Name your own logo "Logo.png".
2. With reference to the table below, save your own logo to one of the HMI directories on the CompactFlash card:
Storage path:
OEM/sinumerik/hmi/ico/ or
User/sinumerik/hmi/ico/

Folder	Bitmap size
lco640	122 x 19
lco800	160 x 24
lco1024	199 x 30

10.4 Configuring the channel operational message

Overview

The channel operational messages are displayed in the third line of the header in the "Machine" operating area. There are two types of channel operational messages:

1. Channel operational messages that require an operator action to continue a program, e.g. feed enable missing, M01 active.

The channel operational messages are identified by exclamation marks.

2. Channel operational messages that do not require an operator action to continue a program. A stop condition is active for a length of time (>1 s) and is interrupted by the program processing, e.g. dwell time active, waiting for tool change.

The channel operational message is identified by a clock icon and disappears after a certain time.

File

The settings for this are specified in the "slmahdconfig.ini" file.

This file is located on the CompactFlash card in the Siemens/sinumerik/hmi/cfg directory.

Configuring the channel operational message

Section	Meaning
CondStopIcons	Specification of an icon that is to be displayed with a certain channel operational message. If no icon is specified for a certain channel operational message, then the icon specified for "DefaultIcon" is displayed.
CondDelayTime	Specification of how long (in milliseconds) a certain message must be present before it is displayed. <ul style="list-style-type: none">• If no time is specified for a certain channel operational message, then the time specified at "CondDelayTime" is used.• If the channel operational message is to be displayed immediately, "0" must be specified as time.

10.4.1 Standard configuration

"slmahdconfig.ini" file

The channel operational messages are configured in the "CondStopIcons" and "CondDelayTime" sections.

Standard configuration

```
[CondStopIcons]
Default icon = condwait.png
1 = condstop.png ; No NC ready
2 = condstop.png ; No mode group ready
3 = condstop.png ; EMERGENCY STOP active
4 = condstop.png ; Alarm with stop active
5 = condstop.png ; M0/M1 active
6 = condstop.png ; Block in SBL mode terminated
7 = condstop.png ; NC stop active
8 = condstop.png ; Read-in enable missing
9 = condstop.png ; Feed enable missing
10 = condwait.png ; Dwell time active
11 = condwait.png ; Aux. function acknowledgment missing
12 = condstop.png ; Axis enable missing
13 = condwait.png ; Exact stop not reached
14 = condwait.png ; Waiting for positioning axis
15 = condwait.png ; Waiting for spindle
15 = condwait.png ; Waiting for other channel
17 = condstop.png ; Waiting for feedrate override
18 = condstop.png ; Error in NC block
19 = condstop.png ; Waiting for external NC blocks
20 = condwait.png ; Waiting for synchronized action
21 = condwait.png ; Block search active
22 = condstop.png ; Spindle enable missing
23 = condstop.png ; Axis feedrate override
24 = condwait.png ; Waiting for tool change acknowledgment
25 = condwait.png ; Gear step change
26 = condwait.png ; Waiting for position control
27 = condwait.png ; Waiting for thread cut
28 = condwait.png ; Reserved
29 = condwait.png ; Waiting for punching
30 = condwait.png ; Waiting for safe operation
31 = condwait.png ; No channel ready
32 = condstop.png ; Oscillation active
33 = condwait.png ; Axis replacement active
34 = condwait.png ; Axis container rotation
35 = condwait.png ; AXCT: Following axis active
36 = condwait.png ; AXCT: Leading axis active
37 = condwait.png ; AXCT: Follow-up active
38 = condwait.png ; AXCT: Internal status change
39 = condwait.png ; AXCT: Axis/spindle disable
40 = condwait.png ; AXCT: Corr. motion active
41 = condwait.png ; AXCT: Axis replacement active
42 = condwait.png ; AXCT: Axis interpolator active
43 = condwait.png ; Waiting for compile cycle
44 = condwait.png ; Access to system variable
45 = condstop.png ; Search target found
```

```
46 = condwait.png ; Rapid retraction started
47 = condwait.png ; AXCT: Wait for spindle stop
48 = condwait.png ; Machine data match
49 = condwait.png ; Axis replacement: Axis coupled
50 = condwait.png ; Axis replacement: Liftfast active
51 = condwait.png ; Axis replacement: New config active
52 = condwait.png ; Axis replacement: AXCTSW active
53 = condwait.png ; Axis replacement: Waitp active
54 = condwait.png ; Axis in another channel
55 = condwait.png ; Axis replacement: Axis is PLC axis
56 = condwait.png ; Axis replacement: Axis is oscillating axis
57 = condwait.png ; Axis replacement: Axis is Jog axis
58 = condwait.png ; Axis replacement: Command axis
58 = condwait.png ; Axis replacement: Axis is OEM axis
60 = condwait.png ; Coupled following axis
61 = condwait.png ; Coupled-motion following axis
62 = condwait.png ; Coupled slave axis
63 = condstop.png ; Stop at cycle end M0
64 = condstop.png ; Stop at cycle end M1
65 = condwait.png ; Wait: Axis is at fixed stop
66 = condwait.png ; Master-slave switchover active
67 = condwait.png ; Axis replacement: Axis is single axis
68 = condstop.png ; Stop: Target reached after block search
69 = condwait.png ; Synchronism: Synchronous spindle
70 = condwait.png ; Deactivation position synch. spindle
71 = condwait.png ; Waiting for transformer axis enable
72 = condstop.png ; Waiting because of possible collision
73 = condstop.png ; Jog: Position reached
74 = condstop.png ; Jog: Direction blocked
75 = condwait.png ; Brake request
76 = condwait.png ; Wait: G4 still: U
77 = condstop.png ; Axial feed disable from PLC
78 = condstop.png ; Waiting for axial feed enable
79 = condwait.png ; Axial feed disable from SYNACT
80 = condwait.png ; Waiting for master spindle speed
81 = condwait.png ; Waiting for parameter set change
82 = condwait.png ; Waiting for end of motion before
transformation change

83 = condwait.png
84 = condwait.png
85 = condwait.png
```

```
[CondDelayTime]
Default delay time = 1000
1 = 0 ; No NC ready
2 = 0 ; No mode group ready
3 = 0 ; EMERGENCY STOP active
4 = 0 ; Alarm with stop active
5 = 0 ; M0/M1 active
6 = 0 ; Block in SBL mode terminated
7 = 0 ; NC stop active
8 = 0 ; Read-in enable missing
9 = 0 ; Feed enable missing
10 = 0 ; Dwell time active
12 = 0 ; Axis enable missing
```

10.5 Activating block search mode

```
16 = 0           ; Waiting for other channel
17 = 0           ; Waiting for feedrate override
18 = 0           ; Error in NC block
19 = 0           ; Waiting for external NC blocks
22 = 0           ; Spindle enable missing
23 = 0           ; Axis feedrate override
32 = 0           ; Oscillation active
45 = 0           ; Search target found
```

10.5 Activating block search mode

The display is activated via a general configuration machine data item and the user interface used for the selection from the available search variants.

Settings

MD51028 \$MNS_BLOCK_SEARCH_MODE_MASK

- Bit 0 = 1 activates block search with calculation, without approach (default setting)
- Bit 1 = 1 activates block search with calculation, with approach (default setting)
- Bit 4 = 1 activates block search without calculation (default setting)

10.6 Activating the program test

There are several control functions to test and run in a part program that are activated in the "Program Test" control window. The window is displayed in the "Machine" operating area in the "Program Control" window.

Configuring the program test

The window is activated via a general configuration machine data item.

MD51039 \$MNS_PROGRAM_CONTROL_MODE_MASK:

- Bit 0 = 1 window is displayed

10.7 Activating softkeys the for turning/milling technology

The "Multi-mode actions" option must be set to obtain the appropriate softkeys for the activated technology, turning or milling.



Software option

"Multi-mode actions"

Configuring softkeys

MD11602 \$MN_ASUP_START_MASK, ignore stop conditions for ASUB

Bit 1 Self-starting ASUB

Bit 3 Jogging possible in the ASUB

Priority as of which "ASUP_START_MASK" takes effect

MD1160 \$MN_ASUP_START_MASK = 1 or 64

10.8 Configuring the simulation and simultaneous recording

Configuring the simulation

Set the turning or milling technology and the corresponding coordinate system in the channel via the following channel-specific machine data:

Turning technology:

MD52200 \$MCS_TECHNOLOGY = 1

MD52000 \$MCS_DISP_COORDINATE_SYSTEM = 34 (example)

Milling technology:

MD52200 \$MCS_TECHNOLOGY = 2

MD52000 \$MCS_DISP_COORDINATE_SYSTEM = 0 (example)

Enter the meaning of the axes in the channel via the following channel-specific machine data:

MD52206 \$MCS_AXIS_USAGE

- 0 = No special meaning
- 1 = Tool spindle (driven tool)
- 2 = Auxiliary spindle (driven tool)
- 3 = Main spindle (turning)
- 4 = C axis of the main spindle (turning)
- 5 = Counterspindle (turning)
- 6 = C axis of the counterspindle (turning)
- 7 = Linear axis of the counterspindle (turning)
- 8 = Tailstock (turning)
- 9 = Steady (turning)

Enter the direction of rotation for the rotary axes that are not configured in a tool carrier of 5-axis transformation via the following channel-specific machine data:

MD52207 \$MCS_AXIS_USAGE_ATTRIB

- Bit 0: Rotation around 1st geometry axis (for rotary axes)
- Bit 1: Rotation around 2nd geometry axis (for rotary axes)
- Bit 2: Rotation around 3rd geometry axis (for rotary axes)
- Bit 3: Reversal of direction of rotation (for rotary axes)



Software option

You require the following option for further simulation settings:
"3D simulation 1 (finished part)".

Configuring the simultaneous recording



Software option

For the "Simultaneous recording" function, you require the option:
"Simultaneous recording (real-time simulation)".

Activating the machining time display

Timers are provided as system variables in the Program runtime function. Whereas the NCK-specific timers are always activated (for time measurements since the last controller ramp-up), the channel-specific timers must be started via the following machine data.

MD27860 \$MC_PROCESS_TIMERMODE

- Bit 0 = 1 The measurement of the total runtime for all part programs is active (\$AC_OPERATING_TIME)
- Bit 1 = 1 The measurement of the current program runtime is active (\$AC_CYCLE_TIME)
- Bit 4 = 1 Measurement also during active dry run feedrate
- Bit 5 = 1 Measurement also during program test

Deactivating simulation

1. Copy the "slsimconfigsettings.xml" file to the **Siemens**/sinumerik/hmi/appl/systemconfig/simulation directory.
2. Store the file in the following directory: **/User**/sinumerik/hmi/cfg or **/Oem**/sinumerik/hmi/cfg
If the "slsimconfigsettings.xml" file is already available in the directory, only add the entries from the "slsimconfigsettings.xml" Siemens file.
3. Restart HMI sl.
The softkeys for the simulation selection are no longer available.

10.9 Activating the "Teach In" function

The "Teach In" function is enabled via general machine data and activated in the "AUTO" and "MDA" modes with the "Teach progr." softkey.

Settings

MD51034 \$MNS_TEACH_MODE

- Bit 0 = 1 Standard teach in. The "Teach progr." softkey is displayed. The approached position is taken into the program with the "Accept" softkey.
- Bit 1 = 1 The acceptance of the teach-in block can be blocked by the PLC.
DB19.DBX13.0 = 0 Block is accepted
DB19.DBX13.0 = 1 Block is not accepted

Access to the function still depends on access rights.

MD51045 \$MNS_ACCESS_TEACH_IN

Default: 7 The protection level for the execution of "Write traversing movements to MDA buffer" for TEACH IN is specified.

MD51050 \$MNS_ACCESS_WRITE_PROGRAM

Default: 7 The protection level for the writing of part programs is specified.

"Teach prog." softkey not active

- The program is in the stop, reset or interruption mode.
- Not all axes have been referenced.

PLC interface

11.1 Program selection

You can create a program list by combining desired programs from the NC data, e.g. workpieces, part programs and subprograms. These programs can then be selected by the PLC for execution.

Storage location

The program list "plc_proglist_manufacturer.ppl" is stored on the CompactFlash card at the following path: Oem/hmi/plc/programlist

Procedure



1. Select the "Startup" operating area.



2. Press the menu forward key and the "Prog. list" softkey. The "Program List" window appears.



3. Press the "Manufacturer" softkey if you want to create a program list that can be used for all machines of a certain series.
4. Place the cursor in the desired line (program number).
5. Press the "Select program" softkey.



6. The "Programs" window opens. The data tree of the NC memory with workpiece, part program and subprogram directory is displayed.
6. Place the cursor on the desired program and press the "OK" softkey. The selected program is inserted in the first line of the list together with its path.

- OR -

Enter the program name directly in the list.

If you are making entries manually, check that the path is correct (e.g. //NC/WKS.DIR/MEINPROGRAMM.WPD/MEINPROGRAMM.MPF).

If required, the extension (.MPF) is added.

A syntax check is not performed.

Note:

With workpieces, make sure that there is a main program or a job list with the same name in the workpiece itself.



- 7. To remove a program from the list, place the cursor on the appropriate line and press the "Delete" softkey.

- OR -



- To delete all programs from the program list, press the "Delete all" softkey.

11.1.1 Displaying the softkey

The softkeys on the user interface for calling the program lists are activated via general configuration machine data.

Configuring a softkey

MD51041 \$MNS_ENABLE_PROGLIST_USER

- 0 No softkey
- 1 The "Prog. list" softkey is displayed

MD51043 \$MNS_ENABLE_PROGLIST_MANUFACT

- 0 No softkey
- 1 The "MANUFACTURER" softkey is displayed

11.1.2 Program selection via PLC and NC

Function

The NC program to be executed can be specified via the PLC. The names of the NC programs are entered in program lists.

There are three types of program lists where the NC programs are combined into different files:

Data class	Program lists
User	plc_proglist_user.ppl; can be edited by the user
Individual	plc_proglist_individual.ppl (not possible for 840D sl)
Manufacturer	plc_proglist_manufacturer; editing only possible by machine manufacturer

These program lists are entered in the "plc_proglist_main.ppl" control file, but do not contain any NC programs.

Entry of the control file:

- 1 plc_proglist_user.ppl
- 2 plc_proglist_individual.ppl
- 3 plc_proglist_manufacturer.ppl

Interface signals

The PLC issues jobs to the HMI sl to perform a program selection in the NC.

DB 19 (PLC → HMI sl)								
	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
DBB13	Selection							

The job is specified via an index in the control file.

DB 19 (PLC → HMI sl)								
	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
DBB16	1=pas FS							
	Control file = PLC_PROGLIST_MAIN.PPL 1st file: plc_proglist_user.ppl 2nd file: plc_proglist_individual.ppl 3rd file: plc_proglist_manufacturer.ppl							

DB 19 (PLC → HMI sl)
Index 1 to 3 for program lists: Storage on the CompactFlash card in the following folder: For end user: User/sinumerik/hmi/plc/programlist For machine manufacturer: Oem/sinumerik/hmi/plc/programlist For system: Siemens/sinumerik/hmi/plc/programlist

An index in the specified program list refers to the NC program.

DB 19 (PLC → HMI sl)								
	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
DBB17	Part program handling: Index of the file to be transferred from the user list.							

Acknowledgment byte of the HMI sl for the current data transfer status.

DB 19 (HMI sl → PLC)								
	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
DBB26	Selection				Active	Error	OK	Res. for PLC

References:

Function Manual Basic Functions: Various NC/PLC interface signals and functions (A2)

Job processing

A PLC job is processed according to the following scheme:

- The PLC may only initiate a job in the job byte if the acknowledgment byte is 0.
- The HMI sl mirrors the job (excluding the parameter set) in the acknowledgment byte (signaling to the PLC that its job is being processed). The PLC receives a "job active" signal for an unfinished job.
- Once the operation is finished (without error or with error), the PLC must respond again and delete the job byte.
- The HMI sl then sets the acknowledgement byte to 0. This ensures a sequential procedure.

Error IDs at the PLC

DB 19. (HMI sl → PLC)								
	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
DBB27								
	Value	Meaning						
	0	No error						
	1	Invalid number for control file. (Value in DB 19.DBB16 < 127 or invalid)						
	3	Control file "plc_proglist_main.ppl" not found. (Value in DB 19.DBB16 invalid)						
	4	Invalid index in control file. (Incorrect value in DB 19.DBB17)						
	5	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.						

11.2 Activating the key lock

The operator panel keyboard and a keyboard connected to the HMI sl can be locked via an interface signal.

Interface signal

DB 19 Signals to operator panel front (PLC -> HMI)								
	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
	Part program handling: Index of the file to be transferred from the user list.							
DBB0						Key lock On		

DB 19 Signals to operator panel front (PLC -> 2nd HMI)								
	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
	Part program handling: Index of the file to be transferred from the user list.							
DBB50						Key lock On		

11.3 Configuring Caps Lock

The CAPSLOCK function ensures that text entered via an external keyboard is always entered in upper case and not in lower case.

The key behavior is set via a display machine data item.

Setting

MD9009 \$MM_KEYBOARD_STATE

0 CAPSLOCK off

2 CAPSLOCK on (default setting)

The key combination "Ctrl" and Shift is used to switch between upper and lower case.

If the machine data is changed, the system must be rebooted.

11.4 Switching EXTCALL off

EXTCALL must be switched off, when in certain configurations two HMIs are connected to one NCU.

Setting

The processing of NC EXTCALL calls by the HMI can be switched off via a display machine data item.

MD9106 \$MM_SERVE_EXTCALL_PROGRAMS

0 Switch off call processing

1 Switch on call processing (default setting)

Cycles

12.1 Activating cycle support in the editor

Channel-specific configuration machine data

The softkey display for the selection of the cycle support in the program editor is set via a channel-specific configuration machine data item.

MD52200 \$MCS_TECHNOLOGY
= 1 Setting for the turning technology
= 2 Setting for the milling technology

Configuring tool management

13.1 Tool management with/without magazine management

Setting without magazine management

Make the following settings if you are commissioning the tool management **without** NC magazine management:

MD18080 \$MN_MM_TOOL_MANAGEMENT_MASK = 02H

Bit 1 Provide monitoring data.

MD20310 \$MC_TOOL_MANAGEMENT_MASK = 02H

Bit 1 Tool management monitoring functions active.

Functions for monitoring tools (tool life and workpiece count) are enabled.

MD17530 \$MN_TOOL_DATA_CHANGE_COUNTER = 0FH

Identifying tool data change for HMI

Bit 0 Value changes to the tool status (\$TC_TP8) are taken into account in toolCounterC.

Bit 1 Value changes to the remaining tool count (\$TC_MOP4) are taken into account in toolCounterC.

Bit 2 Value changes to the tool data are taken into account in the tool data update service.

Bit 3 Value changes to the magazine data are taken into account in the update service.

MD28450 \$MC_MM_TOOL_DATA_CHG_BUFF_SIZE = 100

Buffer for tool data changes (DRAM)

For every first channel of a TOA. The magazine must also be configured in the NC and PLC.

MD19320 \$ON_TECHNO_FUNCTION_MASK =2000000H

- Bit 25 The channel-specific machine data
MD20310 \$MC_TOOL_MANAGEMENT_MASK; Bit 1 is enabled.

Setting with magazine management

Make the following settings if you are commissioning the tool management **with** NC magazine management:

MD18080 \$MN_MM_TOOL_MANAGEMENT_MASK = 03H

- Bit 0 Provide magazine management data.
- Bit 1 Provide monitoring data.

MD20310 \$MC_TOOL_MANAGEMENT_MASK = 03H

- Bit 0 Magazine management active.
The magazine management functions are enabled for the current channel.
- Bit 1 Tool management monitoring functions active.
The functions for monitoring tools (tool life and workpiece count) are enabled.

MD17530 \$MN_TOOL_DATA_CHANGE_COUNTER = 0FH

Identifying tool data change for HMI sl

- Bit 0 Value changes to the tool status (\$TC_TP8) are taken into account in toolCounterC.
- Bit 1 Value changes to the remaining tool count (\$TC_MOP4) are taken into account in toolCounterC.
- Bit 2 Value changes to the tool data are taken into account in the tool data update service.
- Bit 3 Value changes to the magazine data are taken into account in the update service.

MD28450 \$MC_MM_TOOL_DATA_CHG_BUFF_SIZE = 100

Buffer for tool data changes (DRAM)

For every first channel of a TOA. The magazine must also be configured in the NC and PLC.

MD19320 \$ON_TECHNO_FUNCTION_MASK =10H

Bit 4 The channel-specific machine data
MD20310 \$MC_TOOL_MANAGEMENT_MASK; Bit 0 is enabled.

Further settings

You can enable further functions on the user interface via the following channel-specific configuration machine data / setting data:

MD52270 \$MCS_TM_FUNCTION_MASK

Bit 7 Tools are not created and identified via the tool name, but via the internal tool number, the T number.
Bit 9 Position magazine function is deactivated.
Bit 10 Refers to the Reactivate function of a tool. During Reactivate, the tool is moved to the loading point.

MD54215 \$SNS_TM_FUNCTION_MASK_SET

Bit 0 Diameter display for rotating tools, e.g. milling cutters and drills.
Bit 2 A name is not suggested when creating a tool.
Bit 6 Only numerical entries are permitted in the "Tool identifier".

13.2 Modifying the user interface of the tool management

Requirement

The settings for the tool management user interface are specified in the following files:

File	Technology
sltmlistconfig.xml	Milling technology
sltmturninglistconfig.xml	Turning technology
sltmpcllistconfig.xml	PLC tool management "TRANSLINE 2000"

To change the user interface, you must save the entries to a dedicated file. First, you must create an empty file in the OEM/user directory and enter the configuration.

Please proceed as follows:

1. Open the directory: **/Siemens/sinumerik/hmi/appl**
2. Copy the "oem_ sltmlistconfig.xml" file.
3. Store the copy in the directory **/OEM/sinumerik/hmi/cfg** or **/User/sinumerik/hmi/cfg**.
4. Change the file name according to the set technology.
5. Open the file.

The following contents are displayed:

```
<?xml version="1.0" encoding="UTF-8" standalone="yes" ?>
- <CONFIGURATION>
  <!-- ***** -->
  <!-- enter your configuration behind this comment -->
  <!-- ***** -->
  <!-- ***** -->
  <!-- enter your configuration ahead this comment -->
  <!-- ***** -->
</CONFIGURATION>
```

6. Only enter your changes in the file.

The various options for customizing the user interface according to your needs are outlined in the following sections.

Procedure

- Configure the tool lists
- Configure the list parameters
- Configure the "Additional Data" window
- Configure the "New Tool - Favorites" window
- Configure tool types
- Creating your own texts
- General settings

13.3 Configure the tool lists

13.3.1 Overview

The entries used for configuring the following list views are located in the <LISTCONFIGURATION> tag:

- "Tool List" window, <SITmToollistForm> identifier, see first example
- "Tool Wear" window, <SITmToolwearForm> identifier
- "Magazine" window, <SITmToolmagazinForm> identifier
- "Tool Data OEM" window, <SITmTooloemForm> identifier
This window is hidden in the default configuration. The window is only displayed when you enable it under <Enabled>. See second example.

Entries	Meaning
Enabled	true - Window appears. false - Window is hidden.
CAPTION	Definition of the list name. See first example: "Tool list" appears on the user interface for the "TM_CAPTION_TOOLLIST" identifier.
COLUMNX	Column selection: X stands for the column number.
TOOLTYPE_ALL	The column setting applies to all tool types (_ALL).
TOOLTYPE_XXX	The column setting applies to a particular tool type (_XXX). XXX stands for the number of the tool type.
EMPTY_MAG_PLACE	The column setting applies to an empty magazine location. Empty magazine locations appear in a list sorted according to magazine.
Item	Identifier of the list parameter. See example: The column in which the magazine number and magazine location are displayed is created for the "ToolInMagInPlace" identifier. Tool parameter identifiers (Page 87) Cutting parameter identifiers (Page 88) Monitoring parameter identifiers (Page 90) Magazine location parameter identifiers (Page 90)
DELETE_COLUMN	Delete column.
INSERT_COLUMN	Insert column.

First example: Configure tool list

```

<LISTCONFIGURATION>
  <SITmToollistForm>
    <Enabled value="true" type="bool" />
    <CAPTION>
      <Text value="TM_CAPTION_TOOLLIST" type="QString" />
    </CAPTION>
    <COLUMN1>
      <TOOLTYPE_ALL>
        <Item value="ToolInMagInPlace" type="QString" />
      </TOOLTYPE_ALL>
      <EMPTY_MAG_PLACE>
        <Item value="MagNoMagPlaceNo" type="QString" />
      </EMPTY_MAG_PLACE>
    </COLUMN1>
    <COLUMN2>
      <TOOLTYPE_ALL>
        <Item value="ToolType" type="QString" />
      </TOOLTYPE_ALL>
    </COLUMN2>
    <COLUMN8>
      <TOOLTYPE_200>
        <Item value="NoseAnge" type="QString" />
      </TOOLTYPE_200>
      <TOOLTYPE_220>
        <Item value="NoseAnge" type="QString" />
      </TOOLTYPE_220>
      <TOOLTYPE_240>
        <Item value="GeoPitch" type="QString" />
      </TOOLTYPE_240>
      <TOOLTYPE_999>
        <Item value="NoseAnge" type="QString" />
      </TOOLTYPE_999>
    </COLUMN8>
    <DELETE_COLUMN>
      <COLUMN7 />
    </DELETE_COLUMN>
    <INSERT_COLUMN>
      <COLUMN3>
        <TOOLTYPE_ALL>
          <Item value="ToolIdent" type="QString" />
        </TOOLTYPE_ALL>
      </COLUMN3>
    </INSERT_COLUMN>
  </SITmToollistForm>
</LISTCONFIGURATION>

```

Second example: Enable tool data OEM list

```

<SITmTooloemForm>
  <Enabled value="true" type="bool" />
</SITmTooloemForm>

```

13.3.2 Tool parameter identifiers

For the tool parameters, the following identifiers are used in the configuration file:

Content_identifier	Parameter or property
Empty	Empty field
ToolNo	Number of active tool
AdaptNo	Adapter number assignment
DuploNo	Duplo number
NumCuttEdges	Number of cutting edges of tool
ToolIdent	Tool name
ToolIdentRO	Tool name, read only access
ToolInfo	Tool information
ToolInMag	Magazine in which the tool is located
ToolInPlace	Magazine location containing the tool
ToolInMagInPlace	Magazine number/Magazine location
ToolMonTCW	Type of tool monitoring, tool life, workpiece count and wear. If wear monitoring has not been enabled via the machine data, this parameter is handled like ToolMonTC.
ToolMonTC	Type of tool monitoring, tool life and workpiece count
ToolPlaceSpec	Location type
ToolSearch	Tool search type for replacement tools
ToolMyMag	Owner magazine of the tool
ToolMyPlace	Owner magazine of the tool
ToolSizeLeft	Tool size left in half locations
ToolSizeRight	Tool size right in half locations
ToolSizeUpper	Tool size upper in half locations
ToolSizeDown	Tool size lower in half locations
ToolOverSize	Tool size as fixed setting - two half locations left, two half locations right, one half location top, one half location bottom
ToolStateActiv	Tool status - tool active
ToolStateEnabled	Tool status - tool released
ToolStateLocked	Tool status - tool locked
ToolStateLockedRO	Tool status - tool locked, only read access
ToolStateMeasured	Tool status - tool measured
ToolStatePrewarn	Tool status - tool has reached prewarning limit
ToolStatePrewarnRO	Tool status - tool has reached prewarning limit, only read access
ToolStateInChange	Tool status - tool is being changed
ToolStateFixed	Tool status - tool fixed place coded
ToolStateUsed	Tool status - tool was in use
ToolStateMarkedToUnload	Tool status - tool is marked to unload
ToolStateMarkedToLoad	Tool status - tool is marked to load
ToolStatePermanent	Tool status - tool is permanent
ToolAlarmIsExtended	PLC tool status - function "extended alarm" active
ToolAlarmLimit	PLC tool status - alarm limit reached

Content_identifier	Parameter or property
ToolExtAlarmLimit	PLC tool status - limit "extended alarm" reached
ToolUser_1, ToolUser_2, ... ToolUser_10	OEM tool parameters 1 to 10
ToolAppl_1, ToolAppl_2, ToolAppl_10	Siemens application tool parameters 1 to 10

13.3.3 Cutting parameter identifiers

For the cutting parameters, the following identifiers are used in the configuration file:

Content_identifier	Parameter or property
EdgeNo	Cutting edge number
ToolType	Tool type, cutting parameter 1
CuttEdgePos	Cutting edge position, cutting parameter 2
GeoLength1	Length 1, cutting parameter 3
GeoLengthGeoAx1	Length of geometry axis 1, cutting parameter 3, e.g. length X
GeoLength	Length, cutting parameter 3
GeoLength2	Length 2, cutting parameter 4
GeoLengthGeoAx3	Length of geometry axis 3, cutting parameter 4, e.g. length Z
GeoLength3	Length 3, cutting parameter 5
GeoLengthGeoAx2	Length of geometry axis 2, cutting parameter 5, e.g. length Y
GeoRadius	Radius, cutting parameter 6
GeoCornerRadius	Corner radius, cutting parameter 7
GeoOutsideRadius	Outside radius, cutting parameter 7
GeoLength4	Length 4, cutting parameter 8
PlateLength	Cutting tip length, cutting parameter 8
GeoLength5	Length 5, cutting parameter 9
GeoWidth	Width, cutting parameter 9
PlateWidth	Cutting tip width, cutting parameter 9
GeoPitch	Thread pitch, cutting parameter 9
BoreRadius	Hole radius, cutting parameter 9
GeoAngle1	Angle 1, cutting parameter 10
HolderAngle	Holder angle, cutting parameter 9
GeoAngle2	Angle 2, cutting parameter 11
AngleConicalMillTool	Angle conical mill tools, cutting parameter 11
CuttDirection	Cutting direction, cutting parameter 11
WearLength1	Wear length 1, cutting parameter 12
WearLengthGeoAx1	Wear length of geometry axis 1, cutting parameter 12, e.g. Δ length X
WearLength	Wear length, cutting parameter 12
WearLength2	Wear length 2, cutting parameter 13

Content_identifier	Parameter or property
WearLengthGeoAx3	Wear length of geometry axis 3, cutting parameter 13, e.g. Δ length Z
WearLength3	Wear length 3, cutting parameter 14
WearLengthGeoAx2	Wear length of geometry axis 2, cutting parameter 14, e.g. Δ length Y
WearRadius	Wear radius, cutting parameter 15
WearCornerRadius	Wear corner radius, cutting parameter 16
WearLength4	Wear length 4, cutting parameter 17
WearLength5	Wear length 5, cutting parameter 18
WearAngle1	Wear angle 1, cutting parameter 19
WearAngle2	Wear angle 2, cutting parameter 20
AdaptLength1	Adapter length 1, cutting parameter 21
AdaptLengthGeoAx1	Adapter length of geometry axis 1, cutting parameter 21, e.g. adapter length X
AdaptLength2	Adapter length 2, cutting parameter 22
AdaptLengthGeoAx3	Adapter length of geometry axis 3, cutting parameter 22, e.g. adapter length Z
AdaptLength3	Adapter length 3, cutting parameter 23
AdaptLengthGeoAx2	Adapter length of geometry axis 2, cutting parameter 23, e.g. adapter length Y
ReliefAngle	Relief angle, cutting parameter 24
PlateAngle	Cutting tip angle, combination of cutting parameter 24 and cutting parameter 10
NoseAngle	Nose angle, cutting parameter 24
TeethCount	Number of teeth, cutting parameter 24
CuttRate	Cutting rate, cutting parameter 25
IsoHNoDPH	ISO H number
OrientNo	Cutting orientation
OrientV1	Cutting orientation vector 1
OrientV2	Cutting orientation vector 2
OrientV3	Cutting orientation vector 3
OrientVGeoAx1	Cutting orientation vector of geometry axis 1, cutting orientation parameter 3, e.g. vector X
OrientVGeoAx3	Cutting orientation vector of geometry axis 3, cutting orientation parameter 4, e.g. vector Z
OrientVGeoAx2	Cutting orientation vector of geometry axis 2, cutting orientation parameter 5, e.g. vector Y
EdgeUser_1, ..., EdgeUser_10,	OEM cutting parameter 1, to OEM cutting parameter 10
EdgeAppl_1, ..., EdgeAppl_10x	Siemens application cutting parameter 1, to Siemens application cutting parameter 10

13.3.4 Monitoring parameter identifiers

For the monitoring parameters, the following identifiers are used in the configuration file:

Content_identifier	Parameter or property
SupWarning	Warning limits, taking the current monitoring type into consideration
SupRemaining	Actual value, taking the current monitoring type into consideration
SupDesired	Setpoint, taking the current monitoring type into consideration
SupWarningTime	Tool life warning limit
SupRemainingTime	Tool life actual value
SupWarningPieces	Warning limit for count
SupRemainingPieces	Actual value for workpiece count
SupDesiredTime	Setpoint for tool life
SupDesiredPieces	Setpoint for workpiece count
SupWarningWear	Prewarning limit for wear
SupRemainingWear	Actual value for wear
SupDesiredWear	Setpoint for wear
SupExtendedAlarm	PLC tool management - extended alarm
SupWarningPiecesIncremental	PLC tool management - prewarning limit workpiece count
SupActualPieces	PLC tool management - actual value workpiece count
EdgeSupUser_1, EdgeSupUser_10	OEM cutting monitoring parameter 1, to OEM cutting monitoring parameter 10
EdgeSupAppl_1, EdgeSupAppl_10	Siemens application cutting monitoring parameter 1, to Siemens application cutting monitoring parameter 10

13.3.5 Magazine location parameter identifiers

For the magazine location parameters, the following identifiers are used in the configuration file:

Content_identifier	Parameter or property
MagPlaceKind	Location kind
MagPlaceType	Location type
MagPlaceTNo	Tool number of the tool in this location
MagPlaceWatchNeighbour	Consider adjacent location
MagPlaceStateLocked	Magazine location locked
MagPlaceStateEmpty	Magazine location free
MagPlaceStateResInterMag	Reserved for tool in buffer
MagPlaceStateResLoadTool	Reserved for tool to be loaded
MagPlaceStateOccupiedLeft	Magazine location occupied, left half location
MagPlaceStateOccupiedRight	Magazine location occupied, right half location

Content_identifier	Parameter or property
MagPlaceStateOccupiedUpper	Magazine location occupied, upper half location
MagPlaceStateOccupiedDown	Magazine location occupied, lower half location
MagPlaceStateReservedLeft	Magazine location reserved, left half location
MagPlaceStateReservedRight	Magazine location reserved, right half location
MagPlaceStateReservedUpper	Magazine location reserved, upper half location
MagPlaceStateReservedDown	Magazine location reserved, lower half location
MagPlaceMagazineNo	Magazine number
MagPlaceTypeIdx	Type index
MagPlaceWearGroup	Wear group number
MagPlaceAdaptNo	Adapter number
MagPlaceNo	Magazine location number
MagNoMagPlaceNo	Magazine number/Magazine location number
MagPlaceUser_1, MagPlaceUser_10	OEM magazine location parameter 1, to OEM magazine location parameter 10
MagPlaceAppl_1, MagPlaceAppl_10	Siemens magazine location parameter 1, to Siemens magazine location parameter 10

13.4 Configure the list parameters

In the <PARAMETERCONFIGURATION> tag, you have the following options:

1. Change list parameters
2. Create a new list parameter based on an existing list parameter

Change list parameters

You can change all the parameters included in the system apart from the ISO parameters.

Tool parameter identifiers (Page 87)

Cutting parameter identifiers (Page 88)

Monitoring parameter identifiers (Page 90)

Magazine location parameter identifiers (Page 90)

In the following example, the <GeoRadius> parameter is used.

Entries	Meaning	
HeadLine	Column header. Text entered is displayed as a header. Example: Text "Radius" is displayed as a header (default).	
Tooltip	Text that is displayed in the tooltip. Example: Text "Geometry radius" is displayed in the tooltip (default).	
ShortText	Text if the parameter is displayed in the "More Data" window. Example: Text "Rad." is displayed in the "More Data" window (default).	
Width	Column width in pixels, in relation to a 640 x 480 resolution. See example below: The default column width is changed to 53 pixels.	
DisplayMode	Values that the parameter is displayed with. See example below: The default setting is changed to "DoubleMode". The following values can also be accepted:	
	AnyMode	All characters
	IntegerMode	Integers
	UnsignedIntegerMode	Unsigned integers
	DoubleMode	Values with decimal places The number of decimal places is specified in "DecimalPlaces"
	UnsignedDoubleMode	Unsigned values with decimal places The number of decimal places is specified in "DecimalPlaces"
	Length	Specified length
	Angle	Specified angle
	LinearFeedPerTime	Linear feed in mm/minute
	LinearFeedPerRevolution	Linear feed in mm/revolution
	LinearFeedPerTooth	Linear feed in mm/tooth
	RevolutionSpeed	Speed
	ConstantCuttingSpeed	Constant cutting rate
DecimalPlaces	Number of decimal places if "DoubleMode" or "UnsignedDoubleMode" is selected in DisplayMode. See example: Two decimal places are entered.	
ItemType	Field types in which a value is displayed.	
	TextField	Input/output field for values and texts
	TextFieldReadOnly	Output field for values and texts
	CheckBox	Input/output field for states
	CheckBoxReadOnly	Output field for states
BitMask	Bit mask for the display of a bit from a value. The bit mask is entered as integer value. Bit 0 -> 1, Bit 1 -> 2, Bit 2 -> 4	

Example

Only enter the modified data.

```
<PARAMETERCONFIGURATION>
  <GeoRadius>
    <Width value="53" type="int" />
    <DisplayMode value="DoubleMode" type="QString" />
    <DecimalPlaces value="2" type="int" />
  </GeoRadius>
</PARAMETERCONFIGURATION>
```

Configuring new list parameters based on an existing list parameter.

Assign a new parameter name and enter only the changed data:

Entries	Meaning
	Assign new parameter name See first example: "NewGeoRadius" text.
Base	Name of the parameter on which the new parameter is based. See first example: "GeoRadius" parameter is used as a template.
	Also enter only the changed data here. All other data is taken from the existing parameter. See first example: Column width changed to 46 pixels. Number of decimal places changed to 1.

1. Example

```
<PARAMETERCONFIGURATION>
  <NewGeoRadius>
    <Base value="GeoRadius" type="QString" />
    <Width value="46" type="int" />
    <DisplayMode value="DoubleMode" type="QString" />
    <DecimalPlaces value="1" type="int" />
  </NewGeoRadius>
</PARAMETERCONFIGURATION>
```

2. Example

Entries	Meaning
	Assign new cutting edge parameter name The name is "EdgeUser_1_Bit0" in the following example.
Base	Name of the parameter on which the new parameter is based. In the following example, the "EdgeUser_1" parameter is used as template.
	Also enter only the changed data here. All other data is taken from the existing cutting edge parameter.

Entries	Meaning
	The following entries are changed: Field type: Input/output field for states Value output: All characters Bit mask: Bit 0 Column width changed to 17 pixels. Header changed to "TM_HL_EDGE_USER_1_Bit0" Text in the tooltip changed to "TM_TT_EDGE_USER_1_Bit0"

```

<PARAMETERCONFIGURATION>
  <EdgeUser_1_Bit0>
    <Base value="EdgeUser_1" type="QString" />
    <ItemType value="CheckBox" type="QString" />
    <DisplayMode value="AnyMode" type="QString" />
    <BitMask value="1" type="int" />
    <Width value="17" type="int" />
    <HeadLine value="TM_HL_EDGE_USER_1_Bit0" type="QString" />
    <ToolTip value="TM_TT_EDGE_USER_1_Bit0" type="QString" />
  </EdgeUser_1_Bit0>
</PARAMETERCONFIGURATION>
    
```

13.5 List of tool types

The following tool types are stored in the system.

Coding of tool types

The individually coded tool types are divided up into the following groups depending on the technology used.

Turning technology	Milling technology
Group with type 1xy milling tools	Group with type 1xy milling tools
Group with type 2xy drills	Group with type 2xy drills
Group with type 5xy turning tools	Group with type 7xy special tools, such as a slotting saw
Group with type 7xy special tools, such as a slotting saw	

Coding of tool types for milling tools

Group with type 1xy (milling tool):

- 100 Milling tool according to CLDATA (DIN 66215)
- 110 Ball end mill (cylindrical die sinker)
- 111 Ball end mill (tapered die sinker)
- 120 End mill (without corner rounding)
- 121 End mill (with corner rounding)
- 130 Angle head cutter (without corner rounding)
- 131 Angle head cutter (with corner rounding)
- 140 Face milling
- 145 Thread cutter
- 150 Side mill
- 151 Saw
- 155 Bevel cutter (without corner rounding)
- 156 Bevel cutter (with corner rounding)
- 157 Conical die-milling cutter
- 160 Drill and thread milling cutter

Coding of tool types for drills

Group type 2xy (drills):

- 200 Twist drill
- 205 Drill
- 210 Boring bar
- 220 Center drill
- 230 Countersink
- 231 Counterbore
- 240 Regular thread tap
- 241 Fine-thread tap
- 242 Whitworth-thread tap
- 250 Reamer

Coding of tool types for turning tools

Group type 5xy (turning tools):

500 Roughing tool

510 Finishing tool

520 Plunge cutter

530 Parting tool

540 Threading tool

550 Steel profile

560 Rotary drill (ECOCUT)

580 Oriented probe

Coding of tool types for special tools

Group type 7xy (special tools):

700 Slotting saw

710 3D probe

711 Edge probe

730 Stop

13.6 Configuring the "More data" window

The entries used for configuring the "More Data" window are located in the <MOREDATACONFIGURATION> tag. Various data items can be displayed for each tool type in a number of rows and columns. Each data item to be displayed is specified by entering a list parameter.

Tool parameter identifiers (Page 87)

Cutting parameter identifiers (Page 88)

Monitoring parameter identifiers (Page 90)

A short description of the parameter then appears (ShortText), with the value itself beside it. Configure the list parameters (Page 91)

If another description text is required in the "More Data" window, a text can also be entered in a row or column. In the window, the width of the text is made to conform to that of the short description and value of a parameter.

Any number of rows and columns can be created. A scrollbar appears when the window reaches a certain size.

Entries	Meaning
TOOLTYPE_XXX	Number (XXX) of the tool type See example: Tool type 111 = Ball end mill (tapered die-sinking cutter)
ROWX_COLY	RowX_columnY in question. If there is no entry after rowX and columnY, this field remains blank. See example: In the "More Data" window, the first row is blank.
Item	The following entries are possible: <ul style="list-style-type: none"> • Parameter identifier • Text See example: The header "Corner radius" appears in the second row of the window. The text "Radius" and an input field for the value appear in the third row of the window. The fourth row is blank.

Example

```

<MOREDATACONFIGURATION>
  <TOOLTYPE_111>
    <ROW1_COL1>
    </ROW1_COL1>
    <ROW2_COL1>
      <Item value="TM_DGL_CORNER_RADIUS" type="QString" />
    </ROW2_COL1>
    <ROW3_COL1>
      <Item value="GeoCornerRadius" type="QString" />
    </ROW3_COL1>
    <ROW4_COL2>
    </ROW4_COL2>
  </TOOLTYPE_111>
</MOREDATACONFIGURATION>
    
```

See also

Creating In-House Texts (Page 100)

13.7 Configure the "New tool - favorites" window

Specify the most frequently used tool types in the <NEWTOOLFAVORITESCONFIGURATION> tag.

The specified tool types are displayed in the "New Tool - Favorites" window

Entries	Meaning
StaticTooltypes	Numbers of tool types Enter the individual numbers, separated by blanks. The following section describes the assignment of the tool type and number: List of tool types (Page 94)

Example

```
<NEWTOOLFAVORITECONFIGURATION>
  <StaticTooltypes value="120 140 200 220 240 710 711" type="QString"/>
</NEWTOOLFAVORITECONFIGURATION>
```

13.8 Configure tool types

The entries used for configuring the tool types are located in the <TOOLTYPCONFIGURATION> tag.

Entries	Meaning
TOOLTYPE_XXX	XXX stands for the number of the tool type. The assignment of the tool type and number can be found in the "List of tool types" section. List of tool types (Page 94)
Tooltype	Number (XXX) of the tool type
Name	Text identifier of the tool name. The tool name is displayed in the following windows: <ul style="list-style-type: none"> • "New Tool - Favorites" • "New Tool - Milling Cutter 100 - 199" • "New Tool - Drill 200 - 299" • "New Tool - Special Tool 700-900" See example: For the text identifier TM_PAR_SHANK_END_CUTTER, the name "End mill" appears on the user interface.
Shortname	Text identifier of the tool name. Tool name is displayed in the tool list. See example: For the text identifier TM_PPTT_SHANK_END_CUTTER, the name "MILLING CUTTER" appears on the user interface.
Tooltip	Text identifier of the tool name. This tool name is displayed in the tooltip. See example: For the text identifier TM_TTTT_SHANK_END_CUTTER, the name "End mill" appears on the user interface.

Entries	Meaning
Icon9 - for milling technology	<p>Icon representing the tool type.</p> <p>The icons are displayed in the following windows:</p> <ul style="list-style-type: none"> • "Tool List" in the "Type" column • "New Tool - Favorites" in the "Tool position" column • "New Tool - Milling Cutter 100 - 199" in the "Tool position" column • "New Tool - Milling Cutter 200 - 299" in the "Tool position" column • "New Tool - Special Tool 700 - 900 in the "Tool position" column. <p>The icons are in ".png" format. They are stored according to image resolution in the following directories:</p> <p>oem/sinumerik/hmi/ico/ico640, or ico800, or ico1024 user/sinumerik/hmi/ico/ico640, or ico800, or ico1024</p>
IconX - for turning technology	<p>Icon representing the tool type (see Icon9 - for milling technology)</p> <p>Special feature - tool positions are supported in turning technology.</p> <p>X is for the tool position represented by the icon. Position 9 is an undefined position represented by a cross.</p>
Iconorder	Order in which the tool positions, represented by icons, are switched.

Example

```

<TOOLTYPECONFIGURATION>
  <TOOLTYPE_120>
    <Tooltype value="120" type="uint" />
    <Name value="TM_PAR_SHANK_END_CUTTER" type="QString" />
    <Shortname value="TM_PPTT_SHANK_END_CUTTER" type="QString" />
    <Tooltip value="TM_TTTT_SHANK_END_CUTTER" type="QString" />
    <Icon9 value="to_poly_shank_end_cutter_down.png" type="QString" />
  </TOOLTYPE_120>
</TOOLTYPECONFIGURATION>

```

13.9 Creating In-House Texts

This section describes the procedure used to incorporate your own texts. The texts are stored in the "sltmlistdialog_XXX.ts" file.

If you want to store the texts in the standard languages, you must create a separate file for each language. The files have different language codes. Set the appropriate language code for "XXX".

Language-specific files

Create the following files for the texts.

German	sltmlistdialog_deu.ts
English	sltmlistdialog_eng.ts
French	sltmlistdialog_fra.ts
Spanish	sltmlistdialog_esp.ts
Italian	sltmlistdialog_ita.ts
Chinese	sltmlistdialog_chs.ts

Create your own texts and define their properties in the <Message> tag.

Entries	Meaning
Source	New text identifier See first example: Single-line text with new text identifier "MY_NEW_TEXT". See 2nd example: Two-line text with new text identifier "MY_NEW_TEXT_2_LINES".
Translation	New text Single-line or multi-line text can be entered. "%n" is used to indicate a line break. See first example: Single-line text "My new text" appears on the user interface. See 2nd example: Two-line text "My new text" appears on the user interface.
chars	New text length See first example: Text length of 30 characters is specified. See 2nd example: Text length of ten characters per line is specified.
lines	Number of rows See 2nd example: The number of rows is 2.
remark	Own comment that is not displayed.

Procedure

1. Open the **siemens/sinumerik/hmi/Ing** folder.
2. Copy the "oem_sltmlistdialog_deu.ts" file.
3. Store the copy in the following directory: **oem/sinumerik/hmi/Ing** or **user/sinumerik/hmi/Ing**
4. Change the file name to "sltmlistdialog_deu.ts". For the other languages, change the file name according to the list in "Language-specific files".
5. Open the file. A single-line and a two-line text are created in the following example.

```
<?xml version="1.0" encoding="utf-8"?>
<!DOCTYPE TS><TS>

<!-- ***** -->
<!-- Definition of OEM-Texts -->
<!-- ***** -->
<context>
  <name>SlTmListForm</name>

  <!-- ***** -->
  <!-- enter your text behind this comment -->
  <!-- ***** -->

  <!-- ***** -->
  <!-- 1st example of a single-line text -->
  <!-- ***** -->
  <!--<message>
    <source>MY_NEW_TEXT</source>
    <translation>Mein neuer Text</translation>
    <chars>30</chars>
  </message>-->

  <!-- ***** -->
  <!-- 2nd example of a double spaced text -->
  <!-- ***** -->
  <!--<message>
    <source>MY_NEW_TEXT_2_LINES</source>
    <translation>Mein neuer\nText</translation>
    <remark>Mein Kommentar zum Text</remark>
    <chars>10</chars>
    <lines>2</lines>
  </message>-->

  <!-- ***** -->
  <!-- enter your text ahead this comment -->
  <!-- ***** -->

</context>
</TS>
```

Note

Restart HMI sl. The file is automatically converted when HMI sl starts up.

See also

Configuring the "More data" window (Page 96)

13.10 General settings

The general settings for the tool management user interface are stored in the <SETTINGS> tag.

Entries	Meaning
ReactivateWithMagPos	Refers to the "Reactivate" function. true - Reactivate a locked tool with positioning of the tool at the magazine loading point. false - Reactivate without positioning of the magazine.
ReactivateAllMonitorModes	Refers to the "Reactivate" function. true – The actual values of all the monitoring types set in the NC are reset. false – The actual value of the monitoring type active on the tool is reset.
ReactivateEnabled	Refers to the "Reactivate" function. true - Reactivation is enabled. false - Reactivation is disabled.
MagazineMoveMessage	Refers to the message output while the magazine is moving. true - "Magazine movement running" or "Magazine movement ended" message is displayed. false - Message is not displayed.
CreateNewToolDialog	Refers to the "New tool" function. true - The "New Tool" window appears. In this window, you can specify the type of magazine location and the size of the tool before actually creating the tool. false - The "New Tool" window does not appear. Once the name has been entered, the tool will be created directly in the tool list.
MagazineSelectionDialog	Refers to the "Magazine selection" function. true - A dialog box displaying the buffer, magazine and NC memory is displayed. A check mark can be added to or removed from each of these elements to indicate whether that element appears in the list display. The "Go to" softkey can be used to select an element directly in the list display. false - No dialog box for magazine selection. The system switches between the buffer, the magazines and the NC memory. If there is no MagazineSelectionDialog entry in the <Settings> tag, the dialog box is automatically displayed with more than one magazine (excluding the system magazine) when magazine configuration is taking place. If there is only one magazine, the switchover function is used.
NewToolFavoritesOnly	Refers to the "New tool" function. Only those tool types configured as favorites are offered. Section 1.7
SortationInFirstEtcLevel	Refers to the "Sorting" function. The Sorting function is placed in the first softkey level. The "Continue" function is omitted.

Entries	Meaning
ToolBufferOnceOnTop	Refers to the display of the buffer in the list sorted according to magazine. true – Buffer is displayed at the start of the list. false – Buffer is displayed for each magazine. Only those locations are displayed that are assigned to the magazine.

The following settings refer to markings in the lists.

true - Marking is displayed.

false - Marking is not displayed.

No entry - default setting

If several markings apply to one location, the most important information is displayed.

Entries	Meaning
ShowSymbolActivePlace	Marking of the magazine location at the machining position. true - Default setting applies for the "Revolver" magazine type. false - Setting for all other magazine types.
ShowSymbolLoadPlace	Selection of the magazine location at the loading position. true - Default setting applies for all magazine types (except Revolver is true). false - Setting for the "Revolver" magazine type.
ShowSymbolChangeInSpindlePlace	Marking of the magazine location at the change position. true - Default setting applies for all magazine types (except Revolver is true). false - Setting for the "Revolver" magazine type.
ShowSymbolActiveTool	Marking of the active tool. false - Default setting.
ShowSymbolProgrammedTool	Marking of the follow-on tool. true - Default setting.
ShowSymbolActiveDNo	Marking of the active cutting edge. false - Default setting.
ShowSymbolActiveDNoInTool	Marking of the active tool through the marking of the active cutting edge. true - Default setting for configuration without magazine management. false - Setting for configuration with magazine management.
ShowConflictPositionAndDirection	Marking of a conflict; tool position and cutting direction do not match. true - Default setting.
ShowConflictActiveToolWarning	Marking of a conflict; revolver magazine type and the active tool are not at the the machining position. true - Default setting.

Entries	Meaning
ShowSymbolActiveIsoHNoL1	Marking of the active H number for length 1 in the ISO tool list. true - Default setting.
ShowSymbolActiveIsoHNoL2	Marking of the active H number for length 2 in the ISO tool list. true - Default setting.
ShowSymbolActiveIsoHNoL3	Marking of the active H number for length 3 in the ISO tool list. true - Default setting.
ShowSymbolActiveIsoDNo	Marking of the active D number in the ISO tool list. true - Default setting.
ShowSymbolActiveIsoHDNo	Marking of the active HD number in the ISO tool list. true - Default setting.

Example

```
<SETTINGS>  
  <ReactivateWithMagPos value="false" type="bool" />  
  <MagazineMoveMessage value="false" type="bool" />  
  <CreateNewToolDialog value="true" type="bool" />  
  <MagazineSelectionDialog value="false" type="bool" />  
</SETTINGS>
```

Configuring alarms

14.1 Configuring alarm and message texts via user interface

You can access the following user-specific text files and enter your own alarm texts via the user interface of the HMI sl:

Text file	Alarms
oem_alarms_cycles	Cycle alarm texts
oem_alarms_plc	PLC alarm texts
oem_partprogram_messages	Message texts from the part program

Procedure



1. Select the "Startup" operating area.



2. Press the "HMI" softkey.



3. Press the "Alarm texts" softkey.
The "Select File" window opens and offers the user-specific text files.



4. Select the desired file and press the "OK" softkey.
The text editor opens.



5. Press the "Paste line" softkey to insert a new line.

- OR



Press the "Delete line" softkey to delete a selected line.



6. Press the "Search" softkey.
The "Find" window appears.
Enter the desired alarm text in the "Text" field.



Activate the "Case sensitive" checkbox when a distinction is to be made between upper and lower case in the entered text.

- OR

Press the "Find + replace" softkey.

The "Find and replace" window appears.

Enter the search term in the "Text" field. Enter the replacing term in the "Replace with" field.



7.

Place the cursor in the "Direction" field and choose the search direction (forward, backward) with the "SELECT" key.



Press the "OK" softkey to start Find or Find and replace.



Press the "Cancel" softkey if you want to cancel the action.

Further search options



The cursor jumps to the first entry of the selected alarm text file.



The cursor jumps to the last entry of the selected alarm text file.

14.2 Creating alarm texts via alarm text files

You can create user-specific alarm or message texts via alarm text files.

The alarm texts are stored in standard format (".ts" format) by HMI sl. The ".ts" format is xml-based.

You can create and edit these files not only with HMI sl, but also externally on a PC.

Note

If you wish to edit alarm text files on a PC, use an editor supporting UTF-8 coding.

Depending on which editor you use, set the character set to "UTF-8" or save the file with "UTF-8" coding".

Alarm texts for HMI sl

- Create your own alarm texts.
- Replace standard alarm texts with your own alarm texts.
- Create part program messages.
- Convert alarm texts of HMI Advanced to HMI sl.

Directory

For HMI sl, all alarm and message text files are stored on the CompactFlash Card:

"Siemens"	(/Siemens/sinumerik/hmi/lng/)
"Add_on"	(/Add_on/sinumerik/hmi/lng/)
"OEM"	(/OEM/sinumerik/hmi/lng/)
"User"	(/User/sinumerik/hmi/lng/)

The following areas are available for your own alarm text files:

- "OEM" for the machine manufacturer
- "User" for the end user

General procedure

1. Create alarm text file and enter alarm texts.
2. Create foreign-language alarm text files and enter alarm texts.
3. Create and complete configuration file.
4. Create and complete alarm attribute file (only for part program messages).
5. Restart the HMI sl.

Alarm text file

Create your own alarm texts in the alarm text file.

- You can create a new alarm text file or use a copy of the sample file.
- Specify a unique name for the file, e.g. "namexyz_eng.ts".

Note the following when assigning a name:

- Any name can be chosen but it must be written in lower case.
- The name must be followed by an underscore character.
- Use the defined abbreviations for the languages, as shown in the "Supported languages" table.
- The name must contain a period and file extension.

Foreign-language alarm text file

Create your own alarm texts in a foreign language in the foreign-language alarm text file.

- Copy the file you have already created.
- Only change the language code in the file name.
- Store the file in the same directory as the already created alarm text file.

Configuration file

Inform the "Alarm&Event Service" of the new alarm text file in the configuration file.

- You can create a new configuration file or use a copy of the sample file.
- Store your own file in directory `/OEM/sinumerik/hmi/cfg` or `/User/sinumerik/hmi/cfg`.
- You can also create and edit the configuration file externally on a PC.

Alarm attribute file

The links of the alarm numbers from a certain alarm source to the alarm text are stored in the alarm attribute file. If you replace the standard alarm texts with your own alarm texts, you have to create a separate alarm attribute file to change the link.

Restart HMI sl

To enable the "Alarm&Event Service" to read the new alarm texts, you must convert them from ".ts" format into binary format.

Restart HMI sl. The format is converted only during startup. During this process, files with the same name with the file extension ".qm" are created in the same directory.

The result of the conversion is written to a ".log" error file and stored on the CompactFlash Card in the User directory.

14.2.1 Creating in-house alarm texts

If you want to create your own alarm texts, you first require two user-specific files. Use the following files as model:

File	Directory
Alarm text file "oem_alarms_eng.ts"	/Siemens/sinumerik/hmi/lng/
Configuration file "oem_slaesvcadapconf.xml"	/Siemens/sinumerik/hmi/cfg

If you want to add further alarm texts later, use the already created user-specific alarm text file.

Creating an alarm text file and entering alarm texts

1. Copy the sample alarm text file "oem_alarms_eng.ts" from the directory /Siemens/sinumerik/hmi/base.
2. Store the file in the directory /OEM/sinumerik/hmi/cfg or /User/sinumerik/hmi/cfg.
3. Specify a unique name for the file, e.g. "namexyz_eng.ts".
4. Open the alarm text file in the editor and insert the following:
For each alarm, a separate area must be inserted between the tags <message> and </message>, e.g.

```
<message>
<source>700000/PLC/PMC</source>
<translation>First OEM sample alarm text</translation>
</message>
```

The <source> tag contains the alarm number and the source URL. "700000" or "700001" and "/PLC/PMC" in the following example. For the possible source URLs, see the table "Source URLs of the NC".

The <translation> tag contains your own alarm text.

```
<!DOCTYPE TS>
<TS>
  <context>
    <name>slaeconv</name>
    <message>
      <source>700000/PLC/PMC</source>
      <translation>Erster OEM-Beispielalarmtext</translation>
    </message>
    <message>
      <source>700001/PLC/PMC</source>
      <translation>Zweiter OEM-Beispielalarmtext</translation>
    </message>
  </context>
</TS>
```

Creating foreign-language alarm text files and entering translation.

1. Copy the modified alarm text file.
2. Change the language code in the file name, see "Supported languages" table, e.g. "namexyz_eng.ts".
3. Store the file in the same directory **/OEM/sinumerik/hmi/Ing/** or **/User/sinumerik/hmi/Ing/**.
4. Open the file in the editor and enter the translated alarm text in the <translation> tag.

Creating and completing configuration file

Incorporate the so-called "BaseNames" in the configuration file. The "BaseNames" is the file name of the alarm text files just created without language code and file extension.

1. Copy the sample configuration file "oem_slaesvcadapconf.xml" from the directory **/Siemens/sinumerik/hmi/base**.
2. Store the file in the directory **/OEM/sinumerik/hmi/cfg** or **/User/sinumerik/hmi/cfg**.
3. Change the name to "slaesvcadapconf.xml".
4. Open the file in the editor and enter the new name in the <BaseNames> tag, "oem_alarms" in the example.

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<!-- Configuration of the Solutionline Alarm & Event Service Adapter -->
<CONFIGURATION>
  <AlarmTexts>
    <BaseNames>
      <BaseName_02 type="QString" value="oem_alarms"/>
    </BaseNames>
  </AlarmTexts>
  ...
</CONFIGURATION>
```

Several alarm text files

1. If there are several own alarm text files, the same number of "BaseNames" must be included in the configuration file. The list can be extended to any length.
2. Copy the content of the tag <BaseNames>, in the example:
<BaseName_02 type="QString" value="oem_alarms"/>
3. Insert the line between the tag <BaseNames> and </BaseNames>.
4. Increment the number of the last existing "BaseName_xx" tag by one.
5. Insert the new name of the corresponding alarm text file.

Note

The tag "BaseName_01" is reserved for Siemens

Special characters in alarm text files

The XML special characters must be specially formatted:

Special characters	Notation
&	&
'	'
<	<
>	>
"	"

Umlauts and ß	Notation
Ä	Ä
Ö	Ö
Ü	Ü
Ä	ä
Ö	ö
Ü	ü
ß	ß

Example

The & character ("ampersand") is replaced by an entity.

Müller, MÜLLER

Output:

Müller, MÜLLER

See also

Editing a file externally (Page 16)

14.2.2 Replacing standard alarm texts

You can replace alarm texts of the standard HMI sl alarms with own alarm texts.

Creating an alarm text file and entering alarm texts

1. Create a new alarm text file in the directory **/OEM/sinumerik/hmi/lng/** or **/User/sinumerik/hmi/lng/**.
2. Assign the file a user-specific name, e.g. "my_nck_alarms_eng.ts".
3. Open the alarm text file in the editor and enter the following:
For each alarm, a separate area must be inserted between the tags `<context>` and `</context>`.
In the following example, NCK alarm 10000 is assigned a new alarm text "OEM sample alarm text for NCK alarm 10.000".
The `<name>` tag contains the new alarm name.
The `<source>` tag contains the alarm number of the standard alarm.
The `<translation>` tag contains your own alarm text.

```
<!DOCTYPE TS>
<TS>
  <context>
    <name>MyNckAlarms</name>
    <message>
      <source>10000</source>
      <translation>OEM Beispielalarmtext für NCK-Alarm 10.000</translation>
    </message>
  </context>
</TS>
```

Creating a foreign-language alarm text file and entering translation

1. Copy the modified alarm text file.
2. Change the language code in the file name, see "Supported languages" table, e.g. "my_nck_alarms_eng.ts".
3. Store the file in the same directory **/OEM/sinumerik/hmi/lng/** or **/User/sinumerik/hmi/lng/**.
4. Open the file in the editor and enter the translated alarm text in the `<translation>` tag.

Creating and completing the alarm attribute file

1. Create a new alarm attribute file in directory **/OEM/sinumerik/hmi/cfg** or **/User/sinumerik/hmi/cfg**.
2. Assign a user-specific name, e.g. "my_alarm_db.xml".
3. Store the file in the directory **/OEM/sinumerik/hmi/cfg** or **/User/sinumerik/hmi/cfg/**.

4. Open the file in the editor.
The file always consists of the two areas <Types> and <Source>:
The <Types> tag contains the definition of the alarm attribute "MSGTEXT" used in the second <Source> area.
The <Sources> tag contains the references to the associated alarm text assigned to an alarm source, e.g. /NCK.
5. Link the <context> <name> tag and the <message> <source> tag from the alarm text file.
In accordance with the example, enter the following link in the alarm attribute file:
<MSGTEXT>MyNckAlarms | 10000</MSGTEXT>
Make sure that the alarm name and the alarm number are separated by the "|" character.
A new link must be incorporated for each alarm, for which the standard text has been replaced.
The following listing shows the alarm attribute file suitable for the example, e.g. "my_alarm_db.xml".

```
<?xml version="1.0" encoding="UTF-8" ?>
<!DOCTYPE SlAeAlarmAttributes>
<SlAeAlarmAttributes Version="01.00.00.00">
  <Types>
    <Type TypeName="Condition" TypeID="32">
      <Category Version="1.0" CatID="1">
        </Attributes>
        <Attribute AttrName="MSGTEXT" AttrID="-1" AttrDataType="10" />
        </Attributes>
      </Category>
    </Type>
  </Types>
  <Sources>
    <Source SourceID="0" SourceURL="/NCK" CatLink="1">
      <Alarms>
        <Alarm AlarmID="10000">
          <MSGTEXT>MyNckAlarms | 10000</MSGTEXT>
        </Alarm>
      </Alarms>
    </Source>
  </Sources>
  <Drives/>
</SlAeAlarmAttributes>
```

Incorporating further links

The following listing shows how to enter references to two alarm texts for two alarm sources (NCK and PLC).

```
<?xml version="1.0" encoding="UTF-8" ?>
<!DOCTYPE slAeAlarmAttributes>
<slAeAlarmAttributes Version="01.00.00.00">
  <Types>
    <Type TypeName="Condition" TypeID="32">
      <Category Version="1.0" CatID="1">
        </Attributes>
        <Attribute AttrName="MSGTEXT" AttrID="-1" AttrDataType="10" />
        </Attributes>
      </Category>
    </Type>
  </Types>
  <Sources>
    <Source SourceID="0" SourceURL="/NCK" CatLink="1">
      <Alarms>
        <Alarm AlarmID="10000">
          <MSGTEXT>MyNckAlarms|10000</MSGTEXT>
        </Alarm>
        <Alarm AlarmID="10001">
          <MSGTEXT>MyNckAlarms|10001</MSGTEXT>
        </Alarm>
      </Alarms>
    </Source>
    <Source SourceID="51" SourceURL="/PLC/PMC" CatLink="1">
      <Alarms>
        <Alarm AlarmID="400100">
          <MSGTEXT>MyPlcAlarms|400100</MSGTEXT>
        </Alarm>
        <Alarm AlarmID="400101">
          <MSGTEXT>MyPlcAlarms|400101</MSGTEXT>
        </Alarm>
      </Alarms>
    </Source>
  </Sources>
</Drives/>
</slAeAlarmAttributes>
```

For the source ID and source URL, see the table "Alarm number ranges".

Creating and completing configuration file

Incorporate the so-called "BaseNames" in the configuration file. The "BaseNames" is the file name of the new alarm text file and alarm attribute file just created, without language code and file extension.

Completing the alarm text file

1. Copy the sample configuration file "oem_slaesvcadapconf.xml" from the directory **/Siemens/sinumerik/hmi/base**.
2. Store the file in the directory **/OEM/sinumerik/hmi/cfg** or **/User/sinumerik/hmi/cfg**.

3. Change the name to "slaesvcadapconf.xml".
4. Open the file in the editor and enter the new name in the <BaseNames> tag, "my_nck_alarms" in the example.

Completing the alarm attribute file

1. Copy the sample configuration file "oem_slaesvcconf.xml" from the directory /**Siemens**/sinumerik/hmi/base.
2. Store the file in the directory /**OEM**/sinumerik/hmi/cfg or /**User**/sinumerik/hmi/cfg.
3. Change the name to "slaesvcconf.xml".
4. Open the file in the editor and enter the new name in the <BaseNames> tag, "my_alarm_db" in the example.

See also

- Range of alarms (Page 121)
- Supported languages (Page 126)
- Creating in-house alarm texts (Page 109)

14.2.3 Creating part program message texts

You can create your own message texts from the part program.

You can create your own separate message texts for each NC channel.

Message texts

The message texts are referenced via the numbers following the "\$" character in the MSG command of the part program, e.g. MSG("\$4711").

Creating an alarm text file and entering message texts

1. Create a new alarm text file in the directory /**OEM**/sinumerik/hmi/lng/ or /**User**/sinumerik/hmi/lng/.
2. Assign the file a user-specific name, e.g. "my_msg_eng.ts".
3. Open the alarm text file in the editor and enter the following:
For each message, a separate area must be inserted between the tags <context> and </context>.
The <name> tag contains the "partprogmsg01" character string and is the default setting for part program message texts from all NC programs.
The <source> tag contains the number from the MSG command.
4. The <translation> tag contains your own message text.

```
<!DOCTYPE TS>
<TS>
  <context>
    <name>partprogmsg01</name>
    <message>
      <source>4711</source>
      <translation>Teileprogramm-Meldung Nr. 4711</translation>
    </message>
  </context>
</TS>
```

Message texts for several channels

It is possible to assign different message texts the same reference number, e.g. 4711, in different NC channels. This means, different message texts are output depending on the channel in which the part program is executed.

To do this, change the last two numbers of the <name> tag entry. For example, you can enter "partprogmsg02" for the second channel.

Creating a foreign-language alarm text file and entering translation

1. Copy the alarm text file.
2. Change the language code in the file name, see "Supported languages" table, e.g. "my_msg_eng.ts".
3. Store the file in the same directory /**OEM**/sinumerik/hmi/lng/ or /**User**/sinumerik/hmi/lng/.
4. Open the file in the editor and enter the translated alarm text in the <translation> tag.

Complete configuration file

1. Copy the sample configuration file "oem_slaesvconf.xml" from the following directory: /**Siemens**/sinumerik/hmi/base
2. Store the file in the directory /**OEM**/sinumerik/hmi/cfg or /**User**/sinumerik/hmi/cfg.
3. Change the name to "slaesvconf.xml".
4. Open the file in the editor and enter the new name in the <BaseNames> tag, "my_msg" in the example.

Separate message texts for each channel

1. Open the "slaesvconf.xml" configuration file.
2. Enter the respective NC channel in the <Connections> tag. Use the XML tag from the following table for the corresponding NC channel. The following entries are required to specify the name "partprogmsg02" for the second NC channel:

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<CONFIGURATION>
  <Connections>
    <PartprogramMessageChannel_02>
      <ContextName type="QString" value="partprogmsg02"/>
    </PartprogramMessageChannel_02>
  </Connections>
</CONFIGURATION>
```

Use the following XML tags for the configuration of the various NC channels:

NC channel	XML tag	NC channel	XML tag
1	PartprogramMessageChannel_01	6	PartprogramMessageChannel_06
2	PartprogramMessageChannel_02	7	PartprogramMessageChannel_07
3	PartprogramMessageChannel_03	8	PartprogramMessageChannel_08
4	PartprogramMessageChannel_04	9	PartprogramMessageChannel_09
5	PartprogramMessageChannel_05	10	PartprogramMessageChannel_10

14.2.4 Converting alarm texts

Use the alarm text converter "HMI SolutionLine Alarm Text Converter" to transfer alarm texts from the HMI Advanced to HMI sl.

The alarm text converter is supplied as installation package in the directory on the following DVD:

DVD name	Order number
SINUMERIK 840D sl NCU SysSW with HMI sl Directory: sw_2.5/tools/	6FC5850-3XC20-3YA8
SINUMERIK 840D sl NCU SysSW with HMI sl Export Directory: sw_2.5/tools/	6FC5850-3YC20-3YA8

User alarm texts of the "com" format of the HMI Advanced are converted to the "ts" format of the HMI sl. Only the alarm numbers and the alarm texts are taken over.

Note

The following data is not converted:

- References to the alarm online help
- Message texts for part program messages with the extended \$ syntax, e.g. MSG("\$4711")

Requirement

The alarm text converter can only run on Windows XP.

Installing the alarm text converter

1. Start the "Setup_AlarmTextConverter.exe" installation package from the DVD and follow the instructions in the "LiesMich.txt" or "ReadMe.txt" text file.
2. Select an arbitrary installation directory. During installation, the program group "HMI SolutionLine Alarm Text Converter" with the entries "Launch AlarmTextConverter" and "Uninstall AlarmTextConverter" is created in the Start menu.

Starting the alarm text converter



1. Start the converter via Start > Programs > HMI SolutionLine Alarm Text Converter > Launch Alarm Text Converter.
2. If you convert the alarm texts:
 - Copy the alarm texts to be converted (*.com) in all languages to the directory, Installation path/alarmtextconverter/source/source path (e.g. with the Windows Explorer).
 - The file names of the alarm texts must contain a valid language code.
 - The file extension must be ".com", e.g. "XYZ_gr.com".
3. If you convert index texts, i.e. texts that are indexed via a parameter value (syntax: "%1<file selector>", e.g. alarm number 10203 "Channel %1 NC start without reference point (action=%2<ALNX>)"):
 - First create a new directory under "Installation path/alarmtextconverter/source".
 - Use the name of the "file selector" as directory name, e.g. /ALNX. If you are using several file selectors, create a corresponding number of directories.
 - Note:**
Observe upper and lower case when creating directories.
 - Copy the index texts to be converted to the directory.
4. Enter the first part of the file name (without language code and file extension) of the HMI sl alarm texts in the "Output File Prefix" input field. This file name is subsequently used to distinguish between the alarm texts of different manufacturers. For this reason, the name should be easily recognizable, e.g. contain the name of the manufacturer.
 - Note:**
The prefix may not begin with a number!

5. Click the "Convert" button.
The converter is started. Two new subdirectories are created below the directory specified in the "Target Path":
 - "...lng" contains the newly created alarm and index texts (my_oem_alarms_.ts) for the HMI sl
 - "...cfg" contains the language-neutral database "my_oem_alarms_db.xml" and the newly created configuration files "slaesvcconf.xml" and "slaesvcadapconf.xml".
The result of the conversion is displayed in a window.
6. Click "OK" to exit the display.
7. Click "Close" to exit the converter.
8. Copy the newly created files, e.g. with WinSCP, to the appropriate directories of the HMI sl.
If the configuration files "slaesvcconf.xml" and "slaesvcadapconf.xml" already exist, copy the newly created contents to the already available configuration file.
9. Restart HMI sl.
The new database and the new alarm texts are converted to binary format during ramp-up, and are then available.
10. The results of the conversion are recorded in the "oem_text_conversion.log" and "oem_ae_database_conversion.log" files.
The files are in the directory: /User/sinumerik/hmi/log

Completing the "slaesvcconf.xml" configuration file

Copy the line that is indented the furthest from the newly created configuration file to the already available file:

```

<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
- <CONFIGURATION>
  ...
  <DataBases>
    ...
    <My_Oem_DataBase type="QString" value="my_oem_alarms_db.hmi" />
  </DataBases>
  ...
</CONFIGURATION>

```

Make sure that the line is inserted between the opening tags <CONFIGURATION> and <DataBases> and the closing tags </DataBases> and </CONFIGURATION>. These tags may only be present once!

Completing the "slaesvcadapconf.xml" configuration file

Alarm texts

Copy the line that is indented the furthest from the newly created configuration file to the already available file:

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
- <CONFIGURATION>
...
- <AlarmTexts>
...
- <BaseNames>
...
  <My_Oem_Alarms type="QString" value="my_oem_alarms" />
  </BaseNames>
...
- </AlarmTexts>
...
</CONFIGURATION>
```

Make sure that the line is inserted between the opening tags <CONFIGURATION>, <AlarmTexts> and <BaseNames> and the closing tags </BaseNames>, </AlarmTexts> and </CONFIGURATION>. These tags may only be present once in each file!

Index texts

Copy the six lines from the opening tag, e.g. <My_Oem_IndexText_1>, to the closing tag, e.g. </My_Oem_IndexText_1>, to the already available file:

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<!-- Configuration of the Solutionline Alarm & Event Service Adapter -->
- <CONFIGURATION>
...
- <IndexTexts>
...
- <My_Oem_IndexText_1>
  <Identifier type="QString" value="ALNX" />
  <BaseName type="QString" value="my_oem_idxALNX" />
  <ContextName type="QString" value="My_Oem_Index_ALNX" />
  <MetaTextID type="QString" value="%ParamValue%" />
  </My_Oem_IndexText_1>
- </IndexTexts>
...
</CONFIGURATION>
```

Make sure that the lines are inserted between the opening tags <CONFIGURATION> and <IndexTexts> and the closing tags </CONFIGURATION> and </IndexTexts>. These tags may only be present once in each file.

See also

Creating part program message texts (Page 115)

14.2.5 Range of alarms

Range of alarms

Numerical range	Description		Source ID	Source URL
000.000 – 009.999	General alarms		0	/NCK
010.000 – 019.999	Channel alarms			
020.000 – 029.999	Axis/spindle alarms			
030.000 – 039.999	Functional alarms	General		
040.000 – 059.999		Reserved		
060.000 – 064.999		Cycle alarms SIEMENS		
065.000 – 069.999		Cycle alarms user		
070.000 – 079.999		Compile cycles manufacturer and OEM		
080.000 – 084.999		Message texts SIEMENS cycles		
085.000 – 089.999		Message texts user cycles		
090.000 – 099.999		Reserved		
100.000 – 129.000	System		10000	/HMI
130.000 – 139.000	OEM			
140.000 – 199.999	Reserved			
200.000 – 299.999	SINAMICS drive		0	/NCK
300.000 – 399.999	611D drive			
400.000 – 499.999	General alarms		51	/PLC/PMC
500.000 – 599.999	Channel alarms			
600.000 – 699.000	Axis/spindle alarms			
700.000 – 799.999	User area			
800.000 – 899.999	Sequencers/graphs			
810.000 – 810.009	System error messages		50	/PLC/DiagBuffer
900.000 – 999.999	611U drive		0	/NCK

There are further Source IDs in addition to the above IDs:

Source ID	Source URL
1	/NCK/Channel#1/Partprogram
2	/NCK/Channel#2/Partprogram
3	/NCK/Channel#3/Partprogram
4	/NCK/Channel#4/Partprogram
5	/NCK/Channel#5/Partprogram
6	/NCK/Channel#6/Partprogram

Source ID	Source URL
7	/NCK/Channel#7/Partprogram
8	/NCK/Channel#8/Partprogram
9	/NCK/Channel#9/Partprogram
10	/NCK/Channel#10/Partprogram

See also

Insert alarm colors (Page 136)

14.2.6 Parameter specifications in alarm texts

Alarm texts can contain alarm parameters (accompanying values) that specify the cause of an alarm in more detail. These parameters are usually numerical values that are transmitted from an alarm source when the alarm is signaled along with the other alarm data.

How the parameters are incorporated into the alarm text is specified via placeholders (parameter specifications) in the language-specific alarm texts, e.g. "Channel %1 Axis %2 in machine data %3 defined for several channels".

On occurrence of an alarm, the text is replaced by the corresponding parameters, e.g.: "Channel **5** Axis **A3** in machine data **4711** defined for several channels".

Standard parameter specifications

The following table shows the standard parameter specifications:

Table 14-1 Standard parameter specifications

Parameter specifier	Description
%1	First parameter from the alarm data of the alarm source
%2	Second parameter from the alarm data of the alarm source
%3	Third parameter from the alarm data of the alarm source
%4	Fourth parameter from the alarm data of the alarm source
%5	Fifth parameter from the alarm data of the alarm source Only for NCK alarms First part (up to the separator) of the fourth parameter from the alarm data of the alarm source
%6	Sixth parameter from the alarm data of the alarm source Only for NCK alarms Second part (between the first and second separator) of the fourth parameter from the alarm data of the alarm source
%7	Seventh parameter from the alarm data of the alarm source Only for NCK alarms Third part (between the second and third separator) of the fourth parameter from the alarm data of the alarm source

Parameter specifier	Description
%8	Eighth parameter from the alarm data of the alarm source Only for NCK alarms Fourth part (between the third and fourth separator) of the fourth parameter from the alarm data of the alarm source
%9	Ninth parameter from the alarm data of the alarm source
%0	Tenth parameter from the alarm data of the alarm source
%Z	Specially for PLC alarms: like %1, for S7-HiGraph alarms, the step number of the graph is displayed
%A	Specially for PLC alarms: Third and fourth places of the decimal Alarm-ID: 123456, corresponds to the axis number
%K	Specially for PLC alarms: Fifth and sixth places of the decimal Alarm-ID: 123456, corresponds to the channel number
%N	Specially for PLC alarms: First and second places of the decimal Alarm-ID: 123456, corresponds to the signal number

14.2.7 Creating in-house text library

If a string, called the "identifier", is inserted in the alarm text in pointed brackets next to the place holder (e.g. "%1<ALNX>"), the parameter itself is not inserted in the alarm text but a further text or text fragment from a text library. The parameter value is used as an index in the text library and selects the text to be used. The text to be used can also contain parameters, including index parameters.

The text library is selected using the identifier in pointed brackets.

The reference from the identifier to the text library is defined via the settings of the "Alarm&Event Service" adapter.

To include in-house alarm texts, the following files are provided as samples:

File	Directory
Parameter file "oem_indexparams_eng.ts"	/Siemens/sinumerik/hmi/lng/
Configuration file "oem_slaesvcadapconf.xml"	/Siemens/sinumerik/hmi/base

The format of the text library corresponds to that of an alarm text file.

Procedure

1. Create parameter file for text library
2. Insert parameter texts
3. Create foreign-language parameter file and translate parameter texts

4. Complete configuration file
5. Restart the HMI sl

Create parameter file for text library

1. Copy the original file "oem_indexparams_eng.ts" from the "Siemens" directory to the /OEM/sinumerik/hmi/lng/ or /User/sinumerik/hmi/lng/ directory.
2. Specify a unique name for the file, e.g. "namexyz_eng.ts".

Please observe the following when choosing a name:

- Any name can be chosen but it must be written in lower case.
- The name must be followed by an underscore character.
- Use the defined abbreviations for the languages, as shown in the "Supported languages" table.
- The name must contain a period and file extension.

Creating an alarm text file on a PC

You can also create the alarm text file externally on a PC.

Editing a file externally (Page 16)

Insert parameter texts

1. Open the file "oem_indexparams_eng.ts" in the editor
2. In the tag <name>, enter an in-house name, e.g.
<name>oem_context</name>
3. For each parameter text, a separate area must be inserted between the tags <message> and </message>, e.g.

```
<message>  
<source>1</source>  
<translation>first OEM parameter text</translation>  
</message>
```

The <source> tag contains the parameter value (the values "1" and "2" in the example).
The <translation> tag contains the parameter text.

```
<!DOCTYPE TS>  
<TS>  
  <context>  
    <name>oem_context</name>  
    <message>  
      <source>1</source>  
      <translation>Erster OEM Parametertext</translation>  
    </message>  
    <message>  
      <source>2</source>  
      <translation>Zweiter OEM Parametertext</translation>  
    </message>  
  </context>  
</TS>
```

Create foreign-language parameter file and translate parameter texts

1. Copy the file you have just modified.
2. Change the language code in the file name, e.g. "oem_indexparams_eng.ts". See Table "Supported languages"
3. Store the file in the same directory **/OEM/sinumerik/hmi/lng/** or **/User/sinumerik/hmi/lng/**.
4. Open the file in the editor and enter the translated parameter text in the <translation> tag.

Complete configuration file

So that the newly-created parameter file is recognized in the text library of the "Alarm&Event Service," the following names must be included in the configuration of the "Alarm&Event Service":

- Identifier
 - BaseName (file name of the parameter text files just created without language code and postfix)
 - ContextName
1. Open the file "slaesvcadapconf.xml" already created for your own alarm texts in the directory **/OEM/sinumerik/hmi/cfg** or **/User/sinumerik/hmi/cfg**
 2. Remove the lines "<!-- Start of comment" and "End of comment -->".
 3. Enter the identifier, e.g. <Identifier type="QString" value="OEM"/>. The identifier is always stated in pointed brackets next to the parameter specification in the alarm text, e.g. %1<OEM>.
 4. Enter the correct BaseName, e.g. <BaseName type="QString" value="oem_indexparams"/>.
 5. Enter the ContextName, e.g. <ContextName type="QString" value="oem_contextEM"/>.

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<!-- Configuration of the Solutionline Alarm & Event Service Adapter -->
<CONFIGURATION>
...
  <!-- Beginn Kommentar
  <AlarmTexts>
    <IndexTexts>
      <OEM_IndexText_01>
        <Identifier type="QString" value="OEM" />
        <BaseName type="QString" value="oem_indexparams" />
        <ContextName type="QString" value="oem_context" />
        <MetaTextID type="QString" value="%ParamValue%" />
      </OEM_IndexText_01>
    </IndexTexts>
  </AlarmTexts>
  <!-- Ende Kommentar -->
</CONFIGURATION>
```

Inserting several identifiers:

1. Mark and copy the definition area <OEM_IndexText_01> to </OEM_IndexText_01>.
2. Insert the area before the tag </IndexTexts>.
3. Change the names of the opening and closing tags, as well as the abovementioned fields "Identifier," "BaseName," and "ContextName".

Note

To prevent overlaps, use different names for the opening and closing tags of the definition area.

The names "IndexText_01" to "IndexText_99" are reserved for Siemens.

Restart the HMI sl

Restart HMI sl. This data is only converted during startup.

See also

Supported languages (Page 126)

14.2.8 Supported languages

Table 14-2 Supported languages

Language	Language code	Standard languages
Chinese (simplified)	chs	X
Chinese (traditional)	cht	
Danish	dan	
German	en	X
English	eng	X
Finnish	fin	
French	fra	X
Italian	ita	X
Japanese	jpn	
Korean	kor	
Dutch	nld	
Polish	plk	
Portuguese	ptb	
Russian	rus	
Swedish	sve	
Spanish	esp	X

Language	Language code	Standard languages
Czech	csy	
Turkish	trk	
Hungarian	hun	
Slovakian	sky	
Romanian	rom	

14.2.9 Opening error file

To enable the "Alarm&Event Service" to read the texts, you must convert them from ".ts" format into binary format. During this process, files with the same name with the file extension ".qm" are created in the same directory.

Restart HMI sl. The format is converted only during startup. The result of the conversion is written to the file "alarmtext_conversion.log". Errors that occur during the conversion, such as syntax errors in a parameter file, are also written to the file.

Note

The conversion is only carried out if the "*.ts" file is newer than the associated "*.qm" file. To force a new conversion, the "*.ts" file must be edited. Deletion of the "*.qm" file is not possible since it is loaded at HMI sl runtime.

Directories

The error files are saved in two directories on the CompactFlash Card.

Directory	Error file
/User/sinumerik/hmi/log/alarm_log	alarmtext_conversion.log
/User/sinumerik/hmi/log/action_log	crash.log

Opening error file



1. Select the "Commissioning" operating area.
2. Press the "System data" softkey.
3. Open the corresponding directory and select the desired file.
4. Press the "Open" softkey to open the error file.

14.2.10 Deactivating a warning

Generally, alarms/messages are not used without alarm texts. If the alarm text is missing, the warning "No text available" is output.

To deactivate the warning, add the <ControlFlags> area to your "slaesvcadapconf.xml" configuration file.

You can copy this area from the original file. The "slaesvcadapconf.xml" file is in the following directory: /**Siemens**/sinumerik/hmi/base

Setting

In the <MissingTextWarning type="bool" value="FALSE"/> tag, deactivate/activate the warning.

Entry	Meaning
TRUE	The warning is displayed
FALSE	The warning is deactivated

Example

```

<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<CONFIGURATION>
  <ControlFlags>
    <!-- MissingTextWarning:
    Normally the use of alarms without a specified message text
    is unusual. To visualize this the warning hint <no text available>
    is appended to the alarm parameters separated by blanks.
    With this flag the warning hint can be switched off.
    TRUE: The warning hint "<no text available>" is added (default).
    FALSE: No warning hint. -->
    <MissingTextWarning type="bool" value="FALSE"/>
  </ControlFlags>
</CONFIGURATION>

```

14.3 Configuring an alarm log

You can adapt the alarm log to your requirements for the Diagnostics operating area. The following options are available:

Specify the number of results

Per default, the alarm log contains all alarms and messages, except for "msg" messages from the NC part program, with their incoming and outgoing time stamps in chronological order. The alarms and messages that are no longer active when the log is displayed are also displayed (historical alarm events).

Persistent storage (permanent storage)

The alarm log is organized as a ring buffer: When the maximum size is exceeded, the oldest entries are overwritten by the new alarm events.

If required, the alarm log can be set up as a persistent log that also contains alarm events from before the last time it was switched on.

NOTICE
For the persistent storage, the alarm log is written to the CompactFlash card which only allows a limited number of write cycles. Therefore, ensure that the storage is only performed when there is a justifiable need! The alarm log is not saved in the default configuration.

Set filter properties

You can filter alarms and messages according to your requirements.

Procedure

1. Create configuration file.
2. Complete configuration file.
3. Restart the HMI sl.

If a user-specific configuration file has already been created, follow the procedure in Section: Complete configuration file

14.3.1 Create configuration file

Create configuration file with HMI sl

1. Copy the sample configuration file "oem_alarmprot_slaesvcconf.xml" from the **/Siemens/sinumerik/hmi/cfg** directory.
2. Store the file in the directory **/OEM/sinumerik/hmi/cfg** or **/User/sinumerik/hmi/cfg**
3. Assign the name "slaesvcconf.xml" to the file.

NOTICE

For the persistent storage, the alarm log is written to the CompactFlash card. The alarm log is not saved in the default configuration.

Create configuration file on PC

You can also create the configuration file externally on a PC.

Editing a file externally (Page 16)

14.3.2 Complete configuration file

Procedure

1. Open the user-specific file "slaesvcconf.xml" in the editor.
2. Enter the number of events to be output in the <Records type .../> tag. The preset value is 500. The maximum number depends on the memory medium.
3. Enter the mode of the persistent storage in the <DiskCare type="int" value="-1"/> tag. The following values are possible:
 - 1: There is no saving of the alarm log (default setting).
 - 0: Each alarm event triggers an immediate saving of the alarm log.
 - >0: Rhythm of the log saving in seconds: When there is a change, the log is saved every n > 0 seconds.
4. You adapt the filter for the entry type in the <Filter> tag. Please observe the following:
 - An alarm event is only entered in the log when it satisfies the filter criterion.
 - If several filters are specified in succession, they must be logically ORed.

- Several filters must be combined in series with the keyword AND for an AND operation.

Note

Each incoming or outgoing event of an alarm or message requires a separate entry, even when they belong to the same alarm or message.

Acknowledgement events are also contained in the alarm log. You require an entry even when this is presently not recognizable in the alarm log.

Filter properties

A filter consists of the following three elements:

- <Identifier> <Relation> <Value>

The following entries are possible for "<Identifier>":

Entry	Description
AlarmID	Alarm number
SourceID:	See Table Range of alarms (Page 121)
SourceURL:	
<Attribute name>:	Arbitrary alarm attribute from the "slaedatabase.xml" file, such as "SEVERITY" or "CLEARINFO".

The following entries are possible for "<Relation>":

Entry	Description
EQUAL	Equal to
NOT	Not equal to
LOWER	Less than
HIGHER	Greater than

The following entries are possible for "<Value>":

Numbers

Character strings

Examples:

Log all alarms with a ClearInfo not equal to 15, i.e. no part program messages:

```
<CONFIGURATION>
  <Protocol>
    <Filters>
      <Siemens_Filter_01 type="QString" value="CLEARINFO NOT 15" />
    </Filters>
  </Protocol>
</CONFIGURATION>
```

Log all alarms with the SourceURL "/NCK" or "/HMI":

```
<CONFIGURATION>
  <Protocol>
    <Filters>
      <Filter_01 type="QString" value="SourceURL EQUAL /NCK" />
      <Filter_02 type="QString" value="SourceURL EQUAL /HMI" />
    </Filters>
  </Protocol>
</CONFIGURATION>
```

Log all alarms with a "SEVERITY greater than 10" and "less than 500":

```
<CONFIGURATION>
  <Protocol>
    <Filters>
      <Filter_01 type="QString" value="SEVERITY HIGHER 10 AND
                                     SEVERTY LOWER 500" />
    </Filters>
  </Protocol>
</CONFIGURATION>
```

Note

The "Siemens_Filter_01" filter is reserved for Siemens.

1. In the <FilePath> tag, adapt the path and file name for the file in which the alarm log is stored persistently:

```
<CONFIGURATION>
  <Protocol>
    <Filters>
      <FilePath type="QString"
value="$(HMI_INSTALL_DIR)user/sinumerik/hmi/
                                     log/alarm_log/slaepp_" />
    </Filters>
  </Protocol>
</CONFIGURATION>
```

- **Path**
Environment variables can also be incorporated in the path, e.g. for the installation directory of the HMI sl: \$(HMI_INSTALL_DIR).
- **File name:**
A 3-digit number and the file extension "hmi" are automatically added to the specified file name during operation, e.g. "slaep_123.xml". The number is automatically increased when:
 - The file has reached the maximum size (DiskCare = 0), or
 - the specified period has elapsed (DiskCare > 0).
Older files are deleted.

<p>NOTICE</p> <p>The CompactFlash card only allows a limited number of write cycles! Therefore, ensure that the storage is only performed when there is a justifiable need! The alarm log is not saved in the default configuration.</p>

Restart the HMI sl

Restart HMI sl. This data is only converted during startup.

14.3.3 Setting the alarm log

Procedure



1. Select the "Diagnosis" operating area.



2. Press the "Alarm log" and "Settings" softkeys.



3. Enter a number in the "Number of entries" field to change the maximum number of administered raised and cleared events. You can specify a value between 0 and 32000.
4. In field "Write mode file", select
 - "off" if the changes are not to be written to a file;
 - "on every event" if every change is to be written to a file;
 - "time controlled" if the file is to be overwritten after a particular period of time. An additional input field called "Time interval" appears in which you can specify a time in seconds.

NOTICE
Limited number of write cycles Depending on the type of hardware used, the alarm log is either written to the hard disk or to a CompactFlash card. The CompactFlash card, in particular only has a limited number of write cycles. Make sure you undo the setting "on every event" if you no longer require storage of the alarm log.

14.4 Changing alarm colors

The colors of the alarms and messages displayed in the message line can be changed individually.

Note

The colors of the tabular overviews of alarms and messages in the "Diagnostics" operating area cannot be changed.

Color types of the alarms

The following color types can be changed for each alarm number and alarm source:

- Font color of the alarm/message text
- Background color of the alarm/message text
- Font color of the alarm number
- Background color of the alarm number

14.4.1 General procedure

First create two user-specific files.

- OR -

To do this, copy the xml sample file from the following directory:

/Siemens/sinumerik/hmi/cfg/oem_slaedatabase.xml: Alarm attribute file

/Siemens/sinumerik/hmi/cfg/oem_slaesvcconf.xml: Configuration file

Specify the user-specific color attributes in the alarm attribute file.

Inform the "Alarm&Event Service" of the new alarm attribute file in the configuration file.

If you want to add further alarm and message colors later, use the already created alarm attribute file and proceed as described in Section: Insert alarm colors

If you want to add further alarm attribute files later, follow the procedure as of Section: Complete configuration file

Procedure

1. Create alarm attribute file.
2. Insert alarm colors.
3. Create configuration file.
4. Complete configuration file.
5. Convert configuration file.

14.4.2 Create alarm attribute file

Create alarm attribute file with HMI sl

1. Copy the sample alarm attribute file "oem_slaedatabase.xml" from the directory **/Siemens/sinumerik/hmi/cfg**
2. Store the file in the **/OEM/sinumerik/hmi/cfg/** or **/User/sinumerik/hmi/cfg/** directory.
3. Assign a unique name to the file, e.g. " muster_slaedatabase.xml ".
Note the following when assigning a name:
 - Any name can be chosen but it must be written in lower case.
 - The name must contain a period and file extension.

Create alarm attribute file on PC

You can also create the alarm attribute file externally on a PC.

Editing a file externally (Page 16)

14.4.3 Insert alarm colors

Procedure

1. Open the created alarm attribute file "muster_slaedatabase.xml" in the editor.
2. Enter the attribute name of the alarm color type to be changed in the <Attribute AttrName> tag. You can change the following color types:

Attribute name	Alarm color type
TEXTCOLOR	Font color of the alarm/message text
TEXTBACKGROUNDDCOLOR	Background color of the alarm/message text
NUMBERCOLOR	Font color of the alarm number
NUMBERBACKGROUNDDCOLOR	Background color of the alarm number

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<!DOCTYPE SIAeAlarmAttributes>
<SIAeAlarmAttributes Version="01.00.00.00" >
  <Types>
    <Type TypeID="32" TypeName="Condition" >
      <Category CatID="1" Version="1.0" >
        <CatDescr>Alarms of the Sinumerik 810/840 D(i).</CatDescr>
        <Attributes>
          <Attribute AttrName="TEXTCOLOR" AttrDefault="" AttrID="5003" AttrDataType="10" >
            <AttrDescr>Text color of the alarm used when displayed at the header panel.</AttrDescr>
          </Attribute>
          <Attribute AttrName="TEXTBACKGROUNDDCOLOR" AttrDefault="" AttrID="5004" AttrDataType="10" >
            <AttrDescr>Back ground color of the alarm used when displayed at the header panel.</AttrDescr>
          </Attribute>
          <Attribute AttrName="NUMBERCOLOR" AttrDefault="" AttrID="5005" AttrDataType="10" >
            <AttrDescr>Text color of the alarm number used when displayed at the header panel.</AttrDescr>
          </Attribute>
          <Attribute AttrName="NUMBERBACKGROUNDDCOLOR" AttrDefault="" AttrID="5006" AttrDataType="10" >
            <AttrDescr>Back ground color of the alarm number used when displayed at the header panel.</AttrDescr>
          </Attribute>
        </Attributes>
      </Category>
    </Type>
  </Types>
```

1. The alarm source is defined in the <Sources> tag. See example: SourceURL="/HMI" and /PLC/PMC. Delete the areas that you do not want to change.

Note

If you want to insert further alarm sources, make sure that the alarm number is always assigned to the correct alarm source. The possible SourceIDs and URLs are listed in the following table:

Range of alarms (Page 121)

2. In the <Alarms> tag, create a separate area for each alarm or for an alarm number range.
3. Enter the alarm number in the <Alarm AlarmID= "... " > tag, or enter the alarm number range in the <Range FromAlarmID= "... " ToAlarmID= "... "> tag.
4. Enter the color values in the following alarm color types:
<TEXTCOLOR>
<TEXTBACKGROUNDCOLOR>
<NUMBERCOCLOR>
<NUMBERBACKCOLOR>
The attributes of the color values are defined by specifying an RGB value:
 - An RGB value always starts with the "#" character.
 - Each R, G or B represents a single-digit hexadecimal number. The RGB value can be specified in one of the following formats: "#RRGGBB".

Example:

#000000: Black

#FF0000: Red

#00FF00: Green

#0000FF: Blue

#FFFFFF: White

The text and number colors have been changed in the following example.

```

<Sources>
  <Source CatLink="1" SourceID="10000" SourceURL="/HMI" >
    <Alarms>
      <Alarm AlarmID="130000" >
        <TEXTCOLOR>#000000</TEXTCOLOR>
        <TEXTBACKGROUNDCOLOR>#FFFFFF</TEXTBACKGROUNDCOLOR>
        <NUMBERCOLOR>#FFFFFF</NUMBERCOLOR>
        <NUMBERBACKGROUNDCOLOR>#000000</NUMBERBACKGROUNDCOLOR>
      </Alarm>
      <Alarm AlarmID="130001" >
        <TEXTCOLOR>#000000</TEXTCOLOR>
        <TEXTBACKGROUNDCOLOR>#FFFFFF</TEXTBACKGROUNDCOLOR>
        <NUMBERCOLOR>#FFFFFF</NUMBERCOLOR>
        <NUMBERBACKGROUNDCOLOR>#000000</NUMBERBACKGROUNDCOLOR>
      </Alarm>
    </Alarms>
  </Source>
  <Source CatLink="1" SourceID="51" SourceURL="/PLC/PMC" >
    <Alarms>
      <Alarm AlarmID="700000" >
        <TEXTCOLOR>#000000</TEXTCOLOR>
        <TEXTBACKGROUNDCOLOR>#FFFFFF</TEXTBACKGROUNDCOLOR>
        <NUMBERCOLOR>#FFFFFF</NUMBERCOLOR>
        <NUMBERBACKGROUNDCOLOR>#000000</NUMBERBACKGROUNDCOLOR>
      </Alarm>
      <Alarm AlarmID="700001" >
        <TEXTCOLOR>#000000</TEXTCOLOR>
        <TEXTBACKGROUNDCOLOR>#FFFFFF</TEXTBACKGROUNDCOLOR>
        <NUMBERCOLOR>#FFFFFF</NUMBERCOLOR>
        <NUMBERBACKGROUNDCOLOR>#000000</NUMBERBACKGROUNDCOLOR>
      </Alarm>
      <Alarms>
        <Range FromAlarmID="700100" ToAlarmID="700199">
          <TEXTCOLOR>#000000</TEXTCOLOR>
          <NUMBERCOLOR>#00FF00</NUMBERCOLOR>
        </Range>
      </Alarms>
    </Source>
  </Sources>

```

14.4.4 Create configuration file

1. Copy the sample configuration file "oem_slaesvconf.xml" from the /Siemens/sinumerik/hmi/cfg directory.
2. Store the file in the directory /OEM/sinumerik/hmi/cfg or /User/sinumerik/hmi/cfg.
3. Assign the name "slaesvconf.xml" to the file.

14.4.5 Complete configuration file

1. Open the file from one of the directories in the editor.
2. Enter the name of the new alarm attribute file in the <OEM_DataBase_xx...> tag, see example "muster_slaedatabase".

Inserting further alarm attribute files

If you add further files with user-specific alarm attributes to the configuration file, you must add a corresponding number of names. The list can be extended to any length.

1. Copy the contents of the <OEM_DataBase_01> file;
In the example: <OEM_DataBase_01 type="QString" value="muster_slaedatabase"/>.
2. Insert the line between the tags <DataBases> and </DataBases>.
3. Increment the number of the last existing "OEM_DataBase_xx" tag by one.
4. Insert the name of the corresponding alarm attribute file, but without the file extension ".xml".

Note

The "DataBase_01" tag is reserved for Siemens

Example

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<!-- Configuration of the Solutionline Alarm & Event Service -->
<CONFIGURATION>
  <DataBases>
+   <!--
+     <OEM_DataBase_01 type="QString" value="muster_slaedatabase"/>
+   </DataBases>
  </CONFIGURATION>
```

14.4.6 Convert configuration file

So that the "Alarm&Event Service" can read the XML files, they must be converted into binary format. Files with the same name are created in the same directory with the file extension ".hmi", e.g. "sample_sladatabase.hmi".

Restart the HMI sl

Restart HMI sl.

This data is only converted during startup. The result of the conversion, including syntax errors in the alarm attribute file, is written into the file "oem_ae_database_conversion.log". The file is located in the **/User/sinumerik/hmi/log** directory.

Note

The conversion is only performed when the time stamp of the "*.xml" file is newer than the associated "*.hmi" file. To force a new conversion, the "*.xml" file must be edited.

Data backup

The following times are recommended for performing a data backup:

- After commissioning
- After changing machine-specific settings
- After the replacement of a hardware component
- For a software upgrade
- Before activation of memory-configuring machine data.

Note

Series machine startup data is saved in a file of type ARC (archive). Where necessary, archives can be edited using the SinuComArc tool.

The drive data is saved as binary data, which cannot be modified.

There are various ways of creating and reloading archives via the user interface of the HMI sl.

- Data can be selected specifically in the data tree and backed up using the "System data" softkey.
- The following selection is offered via the "Series startup" softkey:
 - Creating and reading in series startup
 - Creating PLC hardware upgrade archive (SDBs only)
 - Creating and reading in archive of original status

Storage locations

Archives can be stored in the following directories:

- CompactFlash card at: **User**/sinumerik/data/archive or **Oem**/sinumerik/data/archive
- All configured logical drives (USB, network drives)

NOTICE
USB FlashDrive
USB FlashDrives are not suitable as persistent memory media.



You need the "Additional 256 MB HMI user memory on CF card of NCU" option in order to display the "Local drive" softkey.

15.1 Generating a series startup file

A series startup file can be generated, for example, after the startup of the controller. To do this, control components can be saved individually or jointly. However, it is recommended to save the individual components separately in individual series machine startup files. It is thus possible to reload them independently of each other.

It is also possible to transfer the backed-up data to other controllers so that they can be updated to the same status.

Requirement

You will need at least access rights for protection level 2 (password: Service).

Data of the control components

Control components	Data
NC data	Machine data Setting data Option data Global (GUD) and local (LUD) user data Tool and magazine data Protection zone data R parameters Work offsets Compensation data Display machine data Workpieces, global part programs and subprograms Standard and user cycles Definitions and macros

Control components		Data
	With compensation data	<ul style="list-style-type: none"> • QEC - quadrant error compensation • CEC - operation/angularity compensation • EEC - leadscrew pitch / encoder error compensation Machine-specific compensation data only needs to be archived if the series machine startup file is reloaded to the same controller.
PLC data		OB (organization blocks) FB (function blocks) SFB (system function blocks) FC (functions) SFC (system functions) DB (data blocks) SDB (system data blocks)
HMI data, all		
HMI data, selection:		
	Cycle storage	Definitions and cycles
	Texts	User texts, alarm texts
	Templates	Individual templates, workpiece templates
	Applications	HMI applications, OEM applications
	Engineering	Engineering
	Configuration	Configurations
	Help	Help files
	Version data	Version data
	Logs	Error logs
	User views	Individually compiled tables with selected machine and setting data.
	Dictionaries	Dictionaries
	Programs on local drive	Programs that are in the user memory area of the CompactFlash card.

Procedure



1. Select the "Startup" operating area.



2. Press the menu forward key.



- 3. Press the "Series startup" softkey.
The "Series Startup" window opens.



- 4. Activate the "Series startup" checkbox.
The "Create Series Startup" window opens.

- 5. Select the desired control components.

- 6. Press the "Generate archive" softkey.
The "Generate Archive: Select Archiving" window opens.



- 7. Select the required location for archiving or press the "New directory" softkey to create a suitable subdirectory.
The "New Directory" window appears.



- 8. Enter the required name and press the "OK" softkey.
The directory is created subordinate to the selected folder.



- 9. Press the "OK" softkey.
The "Generate Archive: Name" window opens.



- 10. Enter the required name and press the "OK" softkey.
An archive file with the ARC format type is stored in the selected directory.

15.2 Reading in the series startup file

Procedure



- 1. Select the "Startup" operating area.



Press the menu forward key.



- 2. Press the "Series startup" softkey.



3. Press "OK".

The "Series Startup" window opens.

4. Activate the "Read in series startup" checkbox. The "Select Startup Archive" window opens and the data tree is displayed.

5. Select the desired startup archive (ARC).



6. Press the "OK" softkey.

A safety query prompting whether you really want to perform a series machine startup appears.



7. Press the "OK" softkey.

The "Read In Archive" window opens and a progress message box appears for the read-in process.



8. Press the "Cancel" softkey to cancel the read-in process.

15.3 Backing up the hardware configuration

The hardware is configured via the system data blocks (SDB) and only these are stored in the archive.

Procedure



1. Select the "Startup" operating area.



Press the menu forward key.



2. Press the "Series startup" softkey.

The "Series Startup" window opens.



3. Select "Create PLC hardware upgrade archive (SDBs only)" and press the "OK" softkey.

The "Create PLC hardware upgrade archive (SDBs only): Select archiving" window opens.

4. Select the desired storage location in the displayed data tree.

- OR -



- Press the "New directory" softkey to create a separate directory.
The "New Directory" window appears.
5. Enter the required name and press the "OK" softkey.
The directory is created below the created folder.
6. Press the "OK" softkey.
The "Generate Archive: Name" window opens.
The file type of the archive is ARC and is displayed in the window.
Enter the desired name and press the "OK" softkey.
The archive is generated and stored in the selected directory.

15.4 Creating an archive with original data

You can select this type of series startup in order to save the original status of the controller. The files are archived in the "original.arc" file.

The file is stored on the CompactFlash card in the Archives/Manufacturer directory.

If there is no "original.arc" file in the directory, it is recommended that an archive be generated from the data of the original controller state as delivered.

As with "Create series startup file", control components can be saved individually or jointly.

Requirement

To back up the NC data, you need access rights for protection level 2 (password: Service).

To back up programs/workpieces, you need access rights for protection level 6 (keyswitch position 1).

Data of the control components

Control components		Data
NC data		Machine data Setting data Option data Global (GUD) and local (LUD) user data Tool and magazine data Protection zone data R parameters Work offsets Compensation data Display machine data Workpieces, global part programs and subprograms Standard and user cycles Definitions and macros
	With compensation data	<ul style="list-style-type: none"> • QEC - quadrant error compensation • CEC - operation/angularity compensation • EEC - leadscrew pitch / encoder error compensation Machine-specific compensation data only needs to be archived if the series machine startup file is reloaded to the same controller.
PLC data		OB (organization blocks) FB (function blocks) SFB (system function blocks) FC (functions) SFC (system functions) DB (data blocks) SDB (system data blocks)
HMI data, all		
HMI data, selection:		
	Cycle storage	Definitions and cycles
	Texts	User texts, alarm texts
	Templates	Individual templates, workpiece templates
	Applications	HMI applications, OEM applications
	Engineering	Engineering
	Configuration	Configurations
	Help	Help files
	Version data	Version data
	Logs	Error logs
	User views	Individually compiled tables with selected machine and setting data.
	Dictionaries	Dictionaries
	Programs on local drive	Programs that are in the user memory area of the CompactFlash card.

Procedure



1. Select the "Startup" operating area.



2. Press the menu forward key.



3. Press the "Series startup" softkey.
The "Series Startup" window opens.

4. Activate the "Create archive of original status" checkbox and press the "OK" softkey.

The "Create Series Startup for Original Status" window opens.

5. Select the desired control components.



6. Press the "Generate archive" softkey.
A warning is output if an "original.arc" archive file already exists.



7. Press the "OK" softkey to overwrite the file.
A new archive file is generated and stored in the Archives/Manufacturer directory.

- OR -



Press the "Cancel" softkey so that the existing file is not overwritten.

15.5 Reading in an archive with original data

The data of the original control state is stored in the "original.arc" file. If you want to restore the controller to the as-delivered state, you can read in the original data archive.

Requirement

You will need access rights for protection level 3 (password: End user).

Procedure



1. Select the "Startup" operating area.



2. Press the menu forward key.



3. Press the "Series startup" softkey.
The "Series Startup" window opens.



4. Activate the "Read in archive of original status" checkbox and press the "OK" softkey. HMI sl automatically accesses the "original.arc" file.
A window opens prompting whether you want to perform a series startup.



5. Press the "OK" softkey.
The read-in process is started and a progress message box is displayed in the window.
Any errors that occur are then displayed in the "Write Error Log for Archive" window.

15.6 Creating an archive

If you only want to backup specific data, then you can select the desired files directly from the data tree and generate an archive.

You can display the contents of the selected files (XML, ini, hsp, syf files, programs) in a preview.

You can display information about the file, such as path, name, date of creation and change, in a Properties window.

Requirement

The access rights depend on the relevant areas and range from protection level 7 (keyswitch position 0) to protection level 2 (password: Service).

Storage locations

- On the CompactFlash card under **/User/sinumerik/data/archive**, or **/OEM/sinumerik/data/archive**
- All configured logical drives (USB, network drives)



Software option

You need the "Additional 256 MB HMI user memory on CF card of NCU" option in order to store the archives on the CompactFlash card in the "User" area (User/sinumerik/data/...).

NOTICE
USB FlashDrive
USB FlashDrives are not suitable as persistent memory media.

Procedure



1. Select the "Startup" operating area.



2. Press the "System data" softkey.
The data tree opens.

3. In the data tree, select the required files from which you want to generate an archive.

- OR -



If you want to back up several files or directories, press the "Select" softkey and, using the cursor keys or the mouse, select the required directories or files.



4. If you press the ">>" softkey, further softkeys are displayed on the vertical bar.



Press the "Preview window" softkey.

The contents of the selected file are displayed in a small window. Press the "Preview window" softkey again to close the window.



Press the "Properties" softkey.

Information about the selected file is displayed in a small window. Press the "OK" softkey to close the window.



Press the "Generate archive" softkey.

The "Generate Archive: Select Archiving" window opens.

All the files to be archived and the storage path are displayed.

- OR -

-  5. Select the required location for archiving and press the "New directory" softkey to create a suitable subdirectory. The "New Directory" window appears.
-  6. Enter the required name and press the "OK" softkey. The directory is created subordinate to the selected folder.
-  7. Press the "OK" softkey. The "Generate Archive: Name" window opens.
-  8. Enter the required name and press the "OK" softkey. An archive file in .arc format is created in the selected directory.

15.7 Reading in an archive

If you want to read in a specific archive, you can select this directly from the data tree.

Procedure

-  1. Select the "Startup" operating area.
-  2. Press the "System data" softkey.
- 3. Below the "Archive" directory in the data tree, select the file you want to read in.
-  4. Press the "Read in" softkey.
-  ... 5. Press the "OK" or "Overwrite all" softkey to overwrite existing files.
-  - OR -
-  Press the "Do not overwrite" softkey if you do not want to overwrite existing files.
-  - OR -
Press the "Skip" softkey if the copy operation is to be continued with the next file.



6.

The "Read In Archive" window opens and a progress message box appears for the read-in process.

Press the "Cancel" softkey to cancel the read-in process.

Service and diagnostics

16.1 Displaying PLC and NC variables

The "PLC/NC Status" window supports the observation and modification of PLC memory locations and NC system variables.

You can also modify PLC memory locations.

You receive information in the list on operands, with their format and status value.

PLC operands	
Inputs	Input bit (Ex), input byte (EBx), input word (EWx), input double word (EDx)
Outputs	Output bit (Ax), output byte (ABx), output word (AWx), output double word (ADx)
Bit memory	Memory bit (Mx), memory byte (MBx), memory word (MWx), memory double word (MDx)
Times	Time (Tx)
Meters	Counter (Cx)
Data	Data block (DBx), data bit (DBXx), data byte (DBBx), data word (DBWx), data double word (DBDx)

Formats	
B	Binary
H	hex
D	dec
G	Floating comma (for double words)
C	Character (ASCII character)

Examples

EB2

MW20

DB2.DBB180

\$AA_IM[1]

Changing PLC operands

Changes can only be made to the PLC operands with the appropriate password.

 DANGER
Changes in the states of PLC memory locations have a major impact on the machine. Incorrect configuration of the parameters can endanger human life and cause damage to the machine.

Changing and deleting values



1. Select the "Diagnostics" operating area.



2. Press the "Variab. view" softkey.

The "Variables" window appears.

3. Position the cursor in the "Operand" column and enter the required variable.



4. Press the "INPUT" key.
The operand is displayed with the value.



5. Place the cursor in the "Format" field and choose the required format with "SELECT".



6. Press the "Change" softkey if you would like to edit the value.

- OR -



Press the "Delete" softkey if you would like to delete the entries for the operands.



7. Press the "OK" softkey to confirm the changes or the deletion.

- OR -



Press the "Cancel" softkey to cancel the changes.

Changing the operand address



You can increase or decrease the address by 1 place at a time with the "Operand +" and "Operand -" softkeys.



These operand settings are retained after the control is switched on and off.

16.2 Displaying the Service overview

The status of each machine axis is displayed in the "Service Overview" window.

Information for up to 31 machine axes can be displayed. A column for each available axis is created for this purpose.

Status displays

Display icon		Meaning
	Green	The axis is behaving normally.
	Yellow	The axis is not ready.
	Red	An alarm is pending for this axis.
	Gray	The axis is not affected.
-	Dash	No drive assigned to axis.
#	Special characters	Error when reading the data, e.g. if data is not available.

Enable displays

- Drive enable (terminal 64/63)
- Pulse enable (terminal 64/48)
- Pulse enable (term. 663 / SI: drive relay)
- Setup mode (terminal 112)
- PLC pulse enable
- Speed controller enable NC
- DC link status
- Enable pulses
- Drive ready
- Heatsink temperature warning
- Power section in i2t limitation
- Motor temperature warning
- Measuring system 1 active
- Measuring system 2 active

Procedure



1. Select the "Diagnostics" operating area.



2. Press the menu forward key.
New horizontal softkeys are displayed.



3. Press the "Axis diagn." softkey.
The "Service Overview" window opens.

16.2.1 Selecting axes

To display certain enables and statuses of machine axes, you can arrange a selection of all the axes that are available in any order you wish.

Proceed as follows



1. Select the "Diagnosis" operating area.



2. Press the menu forward key.
New horizontal softkeys are displayed.



3. Press the "Axis diagn." softkey.
The "Service overview" window opens.



4. Press the "Change overview" softkey.
A new softkey bar appears.



5. If you want to display the information relating to the axes that are active, press the "Active axes" softkey. This will display the axes to which a real drive is assigned.

- OR -



Press the "All axes" softkey if you want the information for all axes to be displayed. This will display all the axes that are defined in at least one channel.

- OR -



Press the "Change selection" softkey if you want to make a new axis selection to be displayed.

The "Change selection" window opens and the previous axis list is displayed.

6. Enter the required axes.
The axes entered must be separated by blanks.



7. Press the "OK" softkey to confirm your selection.



8. If you press the "Select. axes" softkey, the axes configured with "Change selection" will be displayed.



9. If you click the "Back" softkey, you will return to the "Service overview" main screen.

16.2.2 Axis diagnosis

The information in the "Service axis/Spindle" window is used to

- check the setpoint branch (e.g. position setpoint, speed setpoint, spindle speed setpoint prog.)
- check the actual-value branch (e.g. actual position value, measuring system 1/2, actual speed value), optimize the position control loop of the axis (e.g. following error, control difference, servo gain factor)
- check the entire control loop of the axis (e.g. through position setpoint/actual-value comparison and speed setpoint/actual-value comparison)
- check hardware faults (e.g. encoder check: if the axis is moved mechanically, the actual position value must change)
- set and check axis monitoring functions.

References

CNC Commissioning Manual: NCK, PLC, drive

Procedure



1. Select the "Diagnostics" operating area.



2. Press the menu forward key.
New horizontal softkeys are displayed.



3. Press the "Axis diagn." softkey.
The "Service Overview" window opens.



4. Press the "Service axis" softkey.
The "Service Axis/Spindle" window opens.



5. Press the "Axis +" or "Axis -" softkey.
The values of the next (+) and the previous (-) axes are displayed.



- OR -



Press the "Axis selection" softkey.
The "Axis Direct Selection" window opens.

Select the required axis directly from those available in the drop-down list box.



6. Confirm the selection with "OK."
The values of the axis are displayed.

16.3 System utilization

For the NC areas you can display the system resources (utilization display) currently being used: This shows you the net and gross runtimes for the position controller, interpolator, and forward motion.

Procedure



1. Select the "Diagnostics" operating area.



2. Press the menu forward key.
New horizontal softkeys are displayed.



3. Press the "Syst. utiliz." softkey.
The "System Utilization" window appears.
You can track the dynamic utilization display.



4. Press the "Stop" softkey to stop the display update.



5. Press the "Start" softkey to refresh the values.

16.4 Creating screenshots

You can create screenshots of the current user interface directly on the TCU.

Each screenshot is saved as a file and stored in a folder.

You can use the default storage path or specify a path yourself.

Procedure

Ctrl + P Press the <Ctrl+P> key combination.

A screenshot of the current user interface is created in .png format.

The file names assigned by the system run in ascending order from "SCR_SAVE_0001.png" to "SCR_SAVE_9999". You can create up to 9,999 screenshots.

Specifying the storage location

The storage location of the screenshots is defined in the "systemconfiguration.ini" file. The file is on the CF card in the following directory: Siemens/sinumerik/hmi/cfg.

To change the storage location, copy the "systemconfiguration.ini" file to the "oem" or "user" directory and change the path.

The default setting is:
[miscellaneous]

```
prt_screen_save_directory=/user/sinumerik/hmi/log/screenshot
```

Opening a file



1. Select the "Startup" operating area.



2. Press the "System data" softkey and open the HMI Data/Logs/Screenshots folder.

You can copy the files to a Windows PC and open them there using, e.g. the "Office Picture Manager" program.

16.5 Calling up the version data

16.5.1 Machine-specific information

Overview

You can store important information about the machine electronically that until now has only been available on paper for the end user notification administration (EUNA). This information can be viewed and/or transferred directly to EUNA (End User Notification Administration) via the set-up drives during servicing.

You can store the following data for each machine type:

- Manufacturer information
- Dealer information
- End user information

You can acquire and store this specific information electronically directly via the user interface of the HMI sl.

Besides entering this address data manually, you can also read in this data from selection files. These selection files are created once and then stored on the CompactFlash card.

16.5.1.1 Acquiring and storing information

In the "Machine Identity" window, you can enter information about the machine itself and addresses of manufacturer, dealer and dealer branches as well as end users. You can add the following data manually or import it from a selected file. In the manufacturer area you can enter additional addresses for manufacturer branches.

Machine information

Entries	Meaning
Machine No.	The unique machine number (serial number of the CompactFlash card) is displayed in the header. This number serves as information only and cannot be changed.
Machine name	The manufacturer assigns a unique machine number in this field which is stored in machine data MD17400 \$MN_OEM_GLOBAL_INFO. The machine name is a mandatory field. No data can be stored until this field is completed.
Machine type	Machine type. If several machine types are stored in a selection file, they are displayed in a selection list.

Acquiring addresses

Under Addresses you can acquire the following data for manufacturer, dealer / dealer branches and end users:

- Customer number
- Manufacturer name and, if required, Branch name / Dealer name / End user name
- Street, Postcode/ZIP code, Location, Country, Region/State
- Address of contact: Name, Phone, Fax, E-mail, URL

Requirements

	Access rights: Protection level 1 (password: Machine manufacturer)
	Access rights: Protection level 2 (password: Service)
	Access rights: Protection level 3 (password: End user)

Procedure

-  1. Select the "Diagnostics" operating area.
-  2. Press the "Machine identity" softkey.
The "Machine Identity" window opens.
-  3. Press the softkey "Manufacturer" if you want to acquire and store manufacturer-specific data.
If you press the "Manufacturer" softkey again, the softkey changes to "Manufacturer branch".
- OR/AND -



Press the softkey "Manufacturer branch" if you want to acquire and store address data of the manufacturer branch.

Pressing the softkey once again changes it back to "Manufacturer".

- OR/AND -



Press the softkey "Dealer" if you want to acquire and store dealer-specific data.

- OR/AND -



Press the softkey "End user" if you want to acquire and store user-specific data.

4. Enter the address data in the following text fields.

- OR -



If selection files exist, all unique information will automatically be set to valid for the system when you press the "OK" softkey. The entries are saved to HMI sl.

See Section: Creating a selection file (Page 166)

16.5.1.2 Creating a selection file

You can store several addresses and machine types in the selection files.

In future, EUNA data will also be available, which you can store in the controller.

The data acquired in the selection files are available to you when you fill in the input fields in the "Machine Identity" window.

Create the following files:

- File "dealer.xml" for dealer data
- File "ma_types.xml" for machine types
- File "oem.xml" for manufacturer data
- File "oemsubs.xml" for manufacturer data of branch
- File "user.xml" for end user data

Procedure



1. Select the "Startup" operating area.



2. Press the "System data" softkey.



3. Copy the files from folder:
/HMI-Data/Templates/Examples/Machine Identity



4. Insert the copy into folder:
/HMI-Data/Templates/Manufacturers/Machine Identity
5. Open the desired file in the editor.
 - If you have only specified one address or one machine type, the data is automatically entered in the input fields when the window opens in HMI sl.
 - If you have entered several addresses or machine types, they are displayed in drop-down list boxes. When you select a list, the data stored for that address is automatically entered in the input fields.

"dealer.xml" file

You can acquire the address data of any number of dealers in file "dealer.xml". Copy the <Dealer> to <Dealer> area for each dealer and enter the data of further dealers.

```
<?xml version="1.0" encoding="utf-8" ?>
<Addresses>
  <Dealer>
    <Customer-Id></Customer-Id>
    <Name></Name>
    <Street></Street>
    <ZIP code></ZIP code>
    <Location></Location>
    <Country></Country>
    <State></State>
    <Contact></Contact>
    <Phone></Phone>
    <Fax></Fax>
    <E-mail></E-mail>
    <URL></URL>
  </Dealer>

</Addresses>
```

Example of file "ma_types.xml"

You can acquire the available machine types in file "ma_types.xml".

```
<?xml version="1.0" encoding="utf-8" ?>  
<Machinetypes>  
  <Type>LC 80</Type>  
  <Type>LC 82</Type>  
  <Type>LC 120</Type>  
  <Type>LC 122</Type>  
  <Type>LC 150</Type>  
</Machinetypes>
```

16.5.1.3 Transferring information

All the machine-specific information of the controller is combined in a configuration via the user interface of the HMI sl. The data can be transferred via set-up drives.

Procedure



1. Select the "Diagnostics" operating area.



2. Press the "Version" softkey.



3. Press the "Save" softkey.

The "Save Version Information: Select Storage Location" window opens. The following storage locations are offered depending on the configuration:

- Local drive
- Network drives
- USB
- Version data (storage location: Data tree in the HMI data directory)



4. Press the "OK" softkey.

The "Save Version Information: Name" window opens. The following options are available:

- In the "Name:" text field, you can assign a file name or leave the field empty. "_config.xml" or "_version.txt" are automatically appended to the file name.
- In text field "Comment", you can add a comment, which is stored with the configuration data.

Select the following via a checkbox:

- Version data (.txt): Output of pure version data in text format.
- Configuration data (.XML): Output of configuration data in XML format. The configuration file contains the data you entered under Machine identity, the license requirements and the version information. Configuration file (Page 172)



5. Press the "OK" softkey to start the data transfer.

16.5.2 Adding hardware components

Most of the hardware components supplied by Siemens are already electronically acquired. You can add further hardware components.

All hardware components are listed in the "versions.xml" configuration file.

The hardware components can be viewed and added via the user interface in the Version screen.

Requirement

You require access right for protection level 2 (password: Service) to add further hardware components.

Entering additional components

If new hardware components are added, they must be assigned to the appropriate categories. The "Select component" drop-down list box offers the following categories in the "Add HW Comp." window:

Category
NCU/PLC
Operator Panel
PLC-peripheral devices
Drive/Motor
Cable
Accessories/Miscellaneous

You record the following data in the "Enter Additional Components (Configuration Data)" window.

Entries	Meaning
Name	Hardware designation
Version	Version of the program
Order No.[MLFB]	Order number
Serial number	Serial number
Number	Number of components

Procedure



1. Select the "Diagnostics" operating area.



2. Press the "Version" softkey.
The window containing the version data appears.



3. Select the "Hardware" area and press the "Details" softkey. The "Version Data / Hardware" window appears.
The "Add HW comp." softkey appears.



4. Press the "Add HW comp." softkey.
The "Select component" drop-down list box opens.

5. Select a category under which you would like to store the hardware information.

The "Enter Additional Components (Configuration Data)" window opens.

6. Enter additional hardware components via the keyboard.

- OR -

If you are using a CSV file (CSV = Comma Separated Values), for example, a EUNA parts list, you can also read in the data.

To do this, press the "Read in CSV File" softkey.

All configured drives are displayed.



Select the storage location where the CSV file is located.
Select the file and press "OK".



The data is transferred from the CSV file into the table.



7. Press the "OK" softkey.
The data is written to the "version.xml" file and is now electronically acquired.

All hardware components are displayed in the "Version Data / Hardware" window.

The manually entered components are assigned a "+", e.g. Cable+.

16.5.3 Configuration file

The machine-specific information is stored in a configuration file. This data stored in XML format provides the basis for further processing in EUNA.

- The data can be read by remote diagnostics.
- The data can also be transferred directly to EUNA, e.g. via network or USB FlashDrive.

Configuration file

The configuration file contains the following data:

- Machine-specific data that is stored in the "Machine identity" dialog box. Machine-specific information (Page 164)
- Hardware/software versions that are stored in the "Versions" dialog box.
- Options requiring licences, which are stored in the "Licensing" dialog box. Licensing (Page 23)

Storage path

Depending on how the drives have been configured, the configuration file can be stored in the available directories.

16.6 Action log

16.6.1 Settings for the action log

In the "Action Log Settings" window you specify whether the operating sequences are to be logged.

You select which control actions are to be logged. This allows you to reconstruct operating sequences at a later stage.

Settings

Logging on	Logging is activated or deactivated.
Alarm status change	Incoming and outgoing alarms are logged.
Keyboard actions	All actions on the operator panel front and on an external keyboard are logged.
Channel status change	NC/PLC states are logged via the information channel status. If this information can be obtained in a timely manner, in many cases these states can be used to verify the operation of the machine control panel.
Window switchover	The form and dialog names (assigned by the programmer) are logged each time a screenform is opened or closed.
Writing NCK/PLC data	The writing of NCK and PLC variables is logged.
File access	Copying to the NC is logged.
Function calls in the NCK (PI services)	Some program sequences, for example, ASUB, are logged.
Curr. program status	Additional information for particular events is activated. For important alarms that require NC Stop, NC Start, or NC Reset, actual values and the current block are recorded for example. The program ascertains which channel and which spindle are used for the additional information.

Write interval file

Settings for updating files:

- "automatic": The action log saves the information to an internal buffer. If the buffer is full the entries are written to the CF card.
The entries may be lost when the controller is switched off.
- "after every entry": All entries are backed up directly, this prevents data loss due to a power failure.
Notice: As CF cards only permit a limited number of write accesses, this setting is not to be recommended for normal operation.
- "time-controlled": New entries are stored for a particular length of time. An additional input field appears in which you can specify a time in seconds.

Save log as file on alarm

The alarm numbers for which a "crash log" is generated are specified. The alarms are entered separated by a comma.

Procedure



1. Select the "Startup" operating area.



2. Press the "HMI", "Diagnostics", and "Action log" softkeys
The "Action Log Settings" window opens.



3. Activate the "Logging on" checkbox to activate the action log.
4. Check the relevant checkbox if you want to acquire particular events in the action log.

16.6.2 Displaying the log file

Loggable data that was logged when the action log function was active are displayed in the "Action Log File" window.

The log is output in English and includes the following columns:

- Date
- Time
- Affected components
- Event ID

Storage location

If the action log is activated, a file for the current log (actual_actionlog.com) is stored in the data tree of the system data in directory HMI Data / Logs / Action logs.

Activating the crash log file via operating area

The crash log (actual_crashlog.com) is a backup file of the current log when a critical event occurs (for example, emergency stop alarm). This file is generated if the entry "Save log as file on alarm" is activated in the settings.

It is then no longer stored in the ring buffer of the action log and can no longer be overwritten with new entries.

The entries in the crash log file are only overwritten when yet another critical events occurs.

Generating crash log file via PLC signal

DB 19 (PLC → HMI sl)								
	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
DBB00		Save action log						

Procedure



1. Select the "Startup" operating area.



2. Press the "System data" softkey.
The data tree is displayed.

You will find the data stored for the current logs (actual_actionlog.com) or crashlogs (actual_crashlog.com) in the HMI data folder under Logs / Action logs.



3. Select a com file under Logs / Action logs in the HMI Data folder and press the "Open" softkey or double-click the file.
4. Press the "Display new" softkey to update the display of events in the current log (actual_actionlog.com).
The entries made since the log file was called up are displayed.

16.6.3 Searching in the log files

You can search for specific events in the log file.

Requirement

The relevant log file is open.

Procedure



1. Press the "Search" softkey.
A new vertical softkey bar appears. The "Search" window opens at the same time.



2. Enter the desired search term in the "Text" field.
3. Place the cursor in the "Direction" field and choose the search direction (forward, backward) with the "Select" button.



4. Press the "OK" softkey to start the search.
If the text you are searching for is found, the corresponding line is highlighted.

- OR -



Press the "Cancel" softkey when you want to cancel the search.

Further search option



1. Press the "Go to End" softkey to scroll to the end of a large log. You are taken to the beginning of the recording.



2. Press the "Go to Beginning" software to return quickly to the most recent log entry.

16.6.4 Storing a log

You can store the displayed log in any directory you select. It is stored as a binary file (*.com file) and as an ASCII file. You can read an ASCII file with any editor.

Requirement

The relevant log file is open.

Procedure



1. Press the "Save Log" softkey.
The "Please Select the Target Directory" window opens in which you can select a storage location.



2. Press the "New Directory" softkey if you want to create a new folder in one of the listed directories.



3. Press the "OK" softkey.

Note

The "Save Log" softkey is only available for files that have not yet been saved.

16.7 PROFIBUS diagnostics

Display the PROFIBUS status for diagnostic purposes during the configuration or when errors occur. This diagnostics window is only intended for information purposes. You cannot modify them.

PROFIBUS connections

- DP1 X126
- DP2 X136
- DP integrated

Display	Meaning/information
Status	
Configuration ok	Status of the configuration  Green: DP master has ramped up  Red: Incorrect response / no communication
Bus status	POWER ON: Status after the controller is switched on. OFFLINE: Basic initialization has been performed. STOP: Start in accordance with the hardware configuration (SDB). CLEAR: PROFIBUS slaves have been parameterized and configured in accordance with the hardware configuration (SDB) and taken into the cyclic data exchange with zero output data. OPERATE: Cyclic data exchange with the PROFIBUS slaves running. ERROR: A fatal error had been detected (e.g. invalid or faulty SDB)
Bus configuration	
Baudrate in MBd	Transmission rate
Cycle time in msec	Configured bus-cycle time; also defines the position controller cycle at the same time
Synchronous part (TDX) in ms	Configured period for the cyclic data exchange within a PROFIBUS DP cycle
PROFIBUS diagnostics/slaves	
Slave no. (DP address)	Configured DP address of the DP slave
Assignment	Information whether the DP slave is assigned to the NC or to the PLC NC: E.g. one or more drives controlled by the NC. PLC: e.g. I/O peripherals or an axis controlled by the PLC. NC/PLC (for DP integrated)
active on the bus	Information whether the DP slave is identified on the bus  Green: DP slave has been detected on the PROFIBUS DP and the data exchange is working error-free with the assigned component (NC and/or PLC)  Red: Incorrect response / no communication

Display	Meaning/information
Synchr. with NC	Information whether the DP slave is running synchronously to NC on the bus ✓ Green: DP slave runs synchronously to NC on the PROFIBUS DP, i.e. there is an isochronous data exchange ✗ Red: Incorrect response / no communication ○ Gray: DP slave is not assigned to the NC, but to the PLC
Number of slots	Number of configured slots within the DP slave

References

Further information about the configuration of the properties of the network interface for PROFIBUS can be found in the following:
 CNC Commissioning Manual: NCK, PLC, Drives, SINUMERIK 840D sl, SINAMICS S120

Procedure



1. Select the "Diagnostics" operating area.



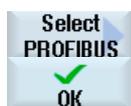
2. Press the menu forward key and the "PROFIBUS" softkey.
 The "PROFIBUS Diagnostics" window is opened.



3. If several PROFIBUS connections have been configured, press the "PROFIBUS -" or "PROFIBUS +" softkey to select the desired configuration.



- OR -



Press the "Select PROFIBUS" softkey, select the desired configuration in the displayed list and then press "OK".

16.7.1 Displaying details for DP slaves

Further information about the slots of a selected DP slave is displayed here.

Display	Meaning/information
Slave	
Slave no.	The DP slaves selected in the PROFIBUS Diagnostics / Slaves pane with information on the NC or NC assignment.
Slots	
No.	Slot number within the DP slave
I/O address	I/O address in the I/O address space of the PLC assigned to this slot. For NC axes, the setpoint and the actual value must always be configured on the same I/O address.
Logical drive no.	Drive number specified in the NC machine data for the axis.
Length (bytes)	Length of the I/O area reserved for the slot in the STEP7 I/O address space
Type	Specification, whether the slot is input, output or diagnostic slot. If the slot is assigned to an NC axis, then the output is always denoted as setpoint value and the input always as actual value.
Machine axis	Display of the name defined in the machine data for this slot. If the slot is not assigned to any NC axis, <No NC-axis> is shown.
Message frame type	Configured message frame type assigned in the NC machine data; if the message frame type is not assigned (-).
Status	Current state of slot. Displayed only for NC axes.  Green: Slot used by NC, communication active.  Red: Slot used by NC, communication currently not active.  Gray: No NC axis.

Procedure



1. Select the "Diagnostics" operating area.



2. Press the menu forward key and the "PROFIBUS" softkey.
The "PROFIBUS Diagnostics" window is opened.



3. Select the PROFIBUS configuration for which you want to display details.



4. Press the "Details" softkey.
The "PROFIBUS Diagnostics ... - Details" window is opened.

16.7.2 Displaying network adapters

The current network adapters (system network X120, company network X130) and their availability are displayed in the "TCP/IP Diagnostics" window.

System network

On the system network, process data communication and image transmission of the components are executed with operator software to the display units (TCUs).

A TCU and NCU are connected to the system network via Ethernet interface X120.

Company network

The company network is used, for example, to access the network drives.

An NCU is connected to the company network via Ethernet interface X130.

Availability of the network connections

Network adapter connection



White Network cable inserted



Red Network cable not inserted

Availability

The availability describes the percentage of faulty packages compared to all the sent and received packages.

Problems in the company network (e.g. logical drives that cannot be reached, double IP address, etc.) as well as the settling time during power up can result in fluctuations in the availability.

	Green	Greater than 95%
	Yellow	50 - 95%
	Red	Less than 50%

Details of the network connections

- **Computer name**
- **DNS name**
Computer name of the controller as stored at the DNS server (**Domain Name Service**).
- **MAC address**
Physical address of the network adapter
- **Address type**
Information about the configuration of the network adapter in the configuration file `basesys.ini`:
 - DHCP: DHCP is active for this network adapter.
 - The information behind the hyphen "-" specifies the DHCP mode of operation:
 - off* - DHCP is deactivated for this adapter
 - Client* - a DHCP client that procures an IP address and further data from a server, is running on the interface
 - Server* - the NCU provides a DHCP server on this interface that supplies clients on this network with IPs
 - Synced Server* - a protocol is active with which several NCUs synchronize with each other. This ensures that always only one of these NCUs functions as DHCP server and, for example, no double IP addresses are assigned.If a network adapter is functioning as "Synced Server", then further information is displayed in the "Status of sync. DHCP server" line
 - If no changes have been made for the network adapters in the configuration file, then "Default" is also output.
 - Manual
The settings IP address, subnet mask, DNS server 1, DNS server 2 and gateway are configured in the `basesys.ini`.

Note:
In the "Change" mode, either "Manual" or "DHCP" can be selected (only for company network, X130).

- **IP address**
Current IP address of the network adapter.
- **Subnet mask**
- **DHCP server**
IP address of the network adapter (with address type "DHCP").
- **Status of sync. DHCP server**
 - Priority of the synch. DHCP server:
Low, High, Master
 - Status of the synch. DHCP server:
Active (current NCU is active in the group of NCUs in the "Synced Server" mode and assigns the IP addresses); Standby (NCU is not active, but could take over the job of server if the active server fails)
- **DNS server 1, DNS server 2**
Domain Name Server
- **Gateway**
- **Note**
All information that is not available is marked in the relevant table line with a hyphen "-".

Modifiable parameters

The following parameters of the company network adapter (X130) can be set by selecting the "Address type":

- Address type
- IP address
- Subnet mask
- DNS server 1 and 2
- Gateway (applies for system and company network)

Address types

- **DHCP**
The values for the settable parameters IP address, subnet mask, DNS server 1, DNS server 2 and gateway are defined automatically by the DHCP server, in accordance with the entry in the basesys.ini.
- **Manual**
The values for the settable parameters IP address, subnet mask, DNS server 1, DNS server 2 and gateway can be specified manually; these are then stored in the basesys.ini.

References

For additional information about network configuration, please refer to the following documentation:

SINUMERIK 840D sl, Operator Components and Networking (IM5)

Procedure



1. Select the "Diagnostics" operating area.



2. Press the menu forward key and the "PROFIBUS" softkey.



3. Press the "TCP/IP diagnostics" softkey.
The "TCP/IP Diagnostics" window is opened and displays the current availability of the network connections.



4. Press the "New display" softkey to refresh the display.



5. Press the "Details" softkey to display all available parameters of the configured network connections.



6. Press the "New display" softkey to refresh the display.



7. Press the "Modify" softkey to change specific parameters.
The fields that can be edited have a white background.



8. Enter the desired changes and press the "OK" softkey to confirm the entries.

16.8 Safety Integrated diagnostics

16.8.1 Status display for Safety Integrated

The status display shows signals or values with NCK and drive information for a selected axis.

Available signals

- Safe actual position
- Position deviation NCK/drive
- "Safe operating stop" monitoring active
- "Safe velocity" monitoring active
- Active SV step
- Active SV correction factor
- Safe actual velocity limit
- Set velocity limit
- Current velocity difference
- Maximum velocity difference
- Active safe software limit switch
- Active gear ratio (step)
- Active stop
- Currently requested external stop
- Stop F code value
- Pulses enabled
- Traversing inhibit, stop in other axis

Procedure



1. Select the "Diagnostics" operating area.



2. Press the menu forward key and the "SI diag." softkey.





The "Safety Integrated Status" window appears.



3. Press the "Axis +" or "Axis -" softkey.

The values of the next or the previous axes are displayed.

- OR -



Press the "Axis selection" softkey and select the desired axis directly from the displayed list of available axes.

16.8.2 Displaying SGE/SGA and SPL signals

Safety-related inputs and outputs

SGE

Safe input signals, NCK, Bit 0...15

Safe input signals, drive, Bit 0...15

Safe input signals, NCK, Bit 16...31

Safe input signals, drive, Bit 16...31

SGA

Safe output signals, NCK, Bit 0...15

Safe output signals, drive, Bit 0...15

Safe output signals, NCK, Bit 16...31

Safe output signals, drive, Bit 16...31

Safe programmable logic

Variables

\$A_INSE (P)	\$A_INSE (P) - corresponds to simultaneous selection of: \$A_INSE (upper line, origin of the NCK) and \$A_INSEP (lower line, origin of the PLC)
\$A_OUTSE (P)	comp. \$A_INSE (P)
\$A_INSI (P)	comp. \$A_INSE (P)
\$A_OUTSI (P)	comp. \$A_INSE (P)
\$A_MARKERSI (P)	comp. \$A_INSE (P)
\$A_PLCSIIN	comp. \$A_INSE (P)
\$A_PLCSIOUT	comp. \$A_INSE (P)

Bit Selection of an 8-bit area of the selected signal.

Available signals/values

- DCC fill level
- DCC status
- DCC control word
- SPL booting state
- SPL started up
- SPL interfaces have been parameterized
- SPL program file SAFE.SPL loaded
- NCK and PLC state
- Interrupt for PLC start should be assigned
- Interrupt has been assigned for PLC start
- Interrupt processing for SPL start called
- Interrupt processing for SPL start terminated
- SPL start implemented using PROG_EVENT mechanism
- NCK data cross-checking (DCC) has been started
- PLC data cross-checking has been started
- Cyclic SPL checksum test active
- All SPL protective mechanisms active

Procedure



1. Select the "Diagnostics" operating area.



2. Press the menu forward key and the "SI diag." softkey.



3. Press the "SGE/SGA" softkey to display the safety-related input and output signals.
The "Safety Integrated SGE/SGA" window appears.

- OR -



Press the "SPL" softkey to display the safe programmable logic signals.
The "Safety Integrated SPL" window appears.

16.8.3 Displaying Safety Integrated checksums

The following checksums are displayed for the overview of the Safety Integrated checksum area:

- Checksum for the safe program SAFE.SPF
- Checksum for NCK and drive for each axis and the corresponding drive, for which the Safety Integrated has been enabled.

You receive information about the time of the last change of the checksum in the NCK.

Procedure



1. Select the "Diagnostics" operating area.



2. Press the menu forward key and the "SI diag." softkey.



3. Press the "SI checksum" softkey.
The "Safety Integrated Checksums" window appears.

16.9 Drive system

16.9.1 Displaying drive states

Information about the drive states of the drive units and drive objects assigned to the NCU is provided in the "Overview" window.

Use the softkeys to select the desired drive unit, for which you want to view the drive states. Then use the cursor to select the desired drive object, for which you want to view the drive states in detail.

The status display (r0002) of the selected drive object is displayed completely in the lower pane, as this information cannot be displayed fully in the upper main window for space reasons.

Display icon		Meaning
	Green	The drive object is in (cyclic) operation, without any detected problems.
	Yellow	The drive object has detected a less serious problem, i.e. a warning is pending, for example, or enables are missing.
	Red	This drive object has detected a serious problem, for example, an alarm is pending.
	Gray	The drive status could not be determined for this drive object.
-	Dash	A drive has not been assigned for this drive object.
#	Special characters	Error when reading the data.

Details of the drive objects

You can display detailed information for every drive object.

Procedure



1. Select the "Diagnostics" operating area.



2. Press the menu forward key and the "Drive system" softkey.



The "Drive States Overview" window opens.

The name of the selected drive object is displayed in the window title.



3. Press the "Drive unit +" or "Drive unit -" softkey.

The values of the next (+) or the previous (-) drive unit are displayed.



- OR -



Press the "Select drive unit" softkey.

The "Select Drive Unit" window opens.

4. Select the desired drive unit via the drop-down list box and press "OK" to confirm the selection.

16.9.2 Displaying details of the drive objects

The following information is displayed for the drive objects:

- Status display (r0002)
 - The status display (parameter r0002) of the drive object is displayed.
 - The enables are diagnosed except for the drive objects that do not have enable signals (e.g. control unit). Missing enables are shown in a pane below the displays.
- Commissioning parameter filter
 - (p0009) – control unit
The value of the "Device commissioning parameter filter" control unit parameter (p0009) is displayed.
 - (p0010) – further drive object
The value of the "Drive object commissioning parameter filter" parameter (p0010) is displayed.
- Current fault
The number of the current drive object fault is displayed or "No fault present", when no drive object fault is pending.
- Current warning
The number of the current drive object warning is displayed or "No warning present", when no drive object warning is pending.

Display icon		Meaning
	Green	The relevant value of the drive object signals no problem detected.
	Yellow	The relevant value of the drive object signals a less serious problem, i.e. a warning is pending, for example, or enables are missing.
	Red	The relevant value of the drive object signals a a serious problem, for example, an alarm is pending.
	Gray	The drive status could not be determined for this drive object.
#	Special characters	Error when reading the data.

Procedure



1. Select the "Diagnostics" operating area.



2. Press the menu forward key and the "Drive system" softkey.



The "Drive States Overview" window opens.



3. Select the drive object for which you want to display further details.
4. Press the "Details" softkey.
The "Drive States Overview - Details" window opens.

16.9.3 Resetting the drive system to factory settings

If serious error messages occur in the drive system diagnostics, you have the possibility to reset already commissioned SINAMICS drives to factory settings.

Procedure



1. Select the "Commissioning" operating area.



2. Press the "Mach. data" softkey.



3. Press the "Control UnitMD", "Infeed MD", or "Drive MD" softkey.

...

- OR -



Press the menu forward key and the "Comm. MD" or "I/O comp. MD" softkey.



...



4. Press the "Factory setting" softkey.
You are queried whether you wish to load the factory settings on the current Control Unit.
5. Press "OK" to load the factory settings.
- OR -
Press the "Cancel" softkey to cancel the process.

Reference

For further information on first commissioning of the SINAMICS drives and on resetting to factory settings refer to the following documentation:

CNC Commissioning Manual: NCK, PLC, Drive

Integrating ePS software

You can use the software from ePS Network Services on the user interface.

Procedure

1. Copy the "systemconfiguration.ini" file to the
/Siemens/sinumerik/hmi/appl/systemconfig/eps/ directory.
2. Insert the file in the /Add_on/sinumerik/hmi/cfg directory.
If the "systemconfiguration.ini" file already exists, copy the entire contents of the original file and insert these in the already available file.
3. Restart the HMI sl.
The softkey for the selection of the ePS software is available in the extended operating area menu.

Information on the ePS software can be found in the following documentation:

References

ePS Function Manual

Safety Integrated

18.1 View of all axes

In the "Machine Configuration" window, you can edit, copy and confirm Safety Integrated data.

Copying and confirming Safety Integrated data

All the NC machine data relevant for the SI functions is transferred to the corresponding drive parameters.

The SI machine data or drive parameters to define the encoder mounting arrangement must be separately entered for the NCK and drive.

Note

Certain drive parameters cannot be copied.

The data can be saved for all safety axes.

Activating and deactivating the startup of the Safety Integrated drives

Value "95" is entered in drive parameter p0010 for the startup of the SI drives.

Value "0" is entered in drive parameter p0010 to exit the startup mode.

References

Further information is available in the Safety Integrated 840D sl Function Manual

See also

Copying and confirming Safety Integrated data (Page 199)

Activating/deactivating startup mode (Page 201)

18.2 General machine data for Safety Integrated

The general machine data is listed in the "Selection of General MD" window. It can be edited, copied and confirmed.

Note

The changes that you make affect all axes.

See also

Copying and confirming Safety Integrated data (Page 199)

18.3 Axis-specific machine data in Safety Integrated

The axis machine data is listed in the "Axis MD" window and can be changed.

Copying and confirming Safety Integrated data for certain axes

Select the desired axis using the "Axis +" or "Axis -" softkey for which the Safety Integrated data is to be copied and confirmed.

See also

Copying and confirming Safety Integrated data (Page 199)

18.4 Drive machine data in Safety Integrated

The drive machine data is listed in the "Selection of Drive MD" window and can be changed.

Activating or deactivating the startup mode

Use the "Drive +" or "Drive -" softkey to select the drive that you want to switch to startup mode.

See also

Activating/deactivating startup mode (Page 201)

18.5 Copying and confirming Safety Integrated data

Copying Safety Integrated data

All the NC machine data relevant for the SI functions is transferred to the corresponding drive parameters.

The SI machine data or drive parameters to define the encoder mounting arrangement must be separately entered for the NCK and drive.

Note

Certain drive parameters are not copied.

The data can be saved for all safety axes.

References

Further information is available in the Safety Integrated 840D sl Function Manual

Procedure



1. Select the "Startup" operating area.



2. Press the menu forward key and the "Safety Integ" softkey.



3. Press the "General MD" softkey if you want to copy and confirm the general Safety Integrated machine data.

- OR -



Press the "Axis views" softkey if you want to copy and confirm all Safety Integrated machine data.

- OR -



Press the "Axis MD" softkey and select an axis using the "Axis +" or "Axis -" softkey if you want to edit axis-specific machine data for the selected axis and want to copy safety data.



4. Press the "Copy SI data" and "OK" softkeys. Safety-relevant drive machine data is transferred and overwritten.



5. Press the "Reset (po)" and "OK" softkeys. The controller restarts (warm restart).



6. Press the "Confirm SI data" and "OK" softkeys. The correctness of the values is confirmed and the current checksum saved.



The drive data is saved automatically

18.6 Activating/deactivating startup mode

For the startup of the Safety Integrated drives, the drive parameter p0010 is switched to startup mode (p0010=95).

At the same time, you can set the drive PROFIsafe address.

"0" is set in drive parameter p0010 to exit the startup mode.

Procedure



1. Select the "Startup" operating area.



2. Press the menu forward key and the "HSK_SI" softkey.



3. Press the "Drive MD" softkey and select the desired drive using the "Drive +" or "Drive -" softkey.

- OR -



...



Press the "Axis view" softkey.



4. Press the "Activate dr. startup" softkey.
A prompt is displayed.



5. Press the "OK" softkey to continue with the startup.
A prompt is displayed whether you want to set the PROFISafe address for the selected drive.



6. Press the "Yes" softkey.
Already existing settings of parameter p9810 are overwritten and the drive parameter p0010 is switched to the startup mode.

- OR -



Press the "No" softkey.

The existing settings of parameter p9810 are retained and the drive parameter p0010 is switched to the startup mode.



7. Press the "Deactivate dr. startup" softkey.

19.1 Configuring the traversing keys of the HT 8

The traversing keys of the HT 8 are not labeled as their type of action is not predefined. The labeling of the traversing keys should adapt dynamically to the type of action of the keys. To recognize the type of action of the traversing keys, they are shown within the display in the vertical softkey area.

The menu of the traversing keys consists of two vertical rows each with eight keys so that up to 16 texts can be configured. The top and bottom traversing key row remain empty and can be assigned other functions.

The following data can be displayed:

- Machine axis name
- Alias name for machine axis
- Any language-dependent text
- Symbol

The following user-specific files are required. Use the following files as model:

File	Directory	Meaning
"sljkconfig.ini" configuration file	/Siemens/sinumerik/hmi/cfg	File in which the traversing keys are configured
"oem_sljk_eng.ts" text file	/Siemens/sinumerik/hmi/lng	File for foreign language labeling of the traversing keys

"sljkconfig.ini" configuration file

Entries	Meaning
[State_1]	Labeling type - changed via the PLC.
ParamText_x_y	Text of the traversing key that is made up of parameters. Two-line labeling is possible, whereby max. five characters is possible per line. x: Specifies the position of the key within the row (2 to 7) y: Specifies the key row (1 or 2)
	%m1 The machine axis name of the first axis is referenced and displayed as text. The current active axis number is read out from data block DB10. The name from the machine data is determined via this index.
	%n Defines the position in the text for the line break.
	%a1 The alias axis name of the first axis is referenced and displayed as text. The current active axis number is read out from data block DB10. The name from the "oem_sljk_eng.ts" text file is determined via this index.
TextId_x_y	Text of the traversing key that is read from the text file (target language text).
Picture_x_y	File name of the icon to be displayed. The files with the icons must be located in the following directories: /OEM/sinumerik/hmi/ico and depending on the resolution of the subdirectories: /ico640 /ico800 /ico1024 /ico1280

Procedure

1. Copy the "sljkconfig.ini" sample configuration file from the /Siemens/sinumerik/hmi/cfg directory.
2. Store the copy in the directory /OEM/sinumerik/hmi/cfg or /User/sinumerik/hmi/cfg.
3. Open the copy in the Editor and define the traversing key labeling.

"sljkconfig.ini" sample configuration file

```
[Settings]
FileType = INI

; Names of machine-axes (%m1, %m2, etc.)
[state_1]
ParamText_2_1 = %m1%n-
ParamText_2_2 = %m1%n+
ParamText_3_1 = %m2%n-
ParamText_3_2 = %m2%n+
ParamText_4_1 = %m3%n-
ParamText_4_2 = %m3%n+
ParamText_5_1 = %m4%n-
ParamText_5_2 = %m4%n+
ParamText_6_1 = %m5%n-
ParamText_6_2 = %m5%n+
ParamText_7_1 = %m6%n-
ParamText_7_2 = %m6%n+

; A few examples for further configuration options
; Alias names of machine-axes (%a1, %a2, etc.), from oem_sljk_deu.ts (example)
[state_1]
ParamText_2_1 = %a1%n-
ParamText_2_2 = %a1%n+
ParamText_3_1 = %a2%n-
ParamText_3_2 = %a2%n+
ParamText_4_1 = %a3%n-
ParamText_4_2 = %a3%n+
ParamText_5_1 = %a4%n-
ParamText_5_2 = %a4%n+
ParamText_6_1 = %a5%n-
ParamText_6_2 = %a5%n+
ParamText_7_1 = %a6%n-
ParamText_7_2 = %a6%n+

; User defined language dependent text, from oem_sljk_deu.ts (example)
[state_1]
TextId_2_1 = OEM_JK_TEXT

; Icons (example)
[state_1]
Picture_2_1 = AlarmCancel.png
Picture_2_2 = AlarmNCRreset.png
```

"oem_sljk_eng.ts" text file

Entries	Meaning
name	Freely selectable name of the text context. In the text file template, the name of the text context is "SIJKLabels" and is for the traversing key labeling (solution line jog key labels). This identifier is already stored in the configuration file.
source	Traversing key identifier of the respective axis. This text ID is referenced in the "sljkconfig.ini" configuration file with the "TextId_2_1". The text IDs for the alias names (JK_AXISNAME_2 to JK_AXISNAME_7) may not be changed.
Translation	Input of the foreign language text for the axis specified in <source>.

Foreign language texts are stored in a separate text file. There is a separate text file for each language, each of which has a different language code in the file name.

1. Copy the "oem_sljk_eng.ts" sample text file from the **/Siemens/sinumerik/hmi/Ing** directory.
2. Store the copy in the **/OEM/sinumerik/hmi/Ing** or **/User/sinumerik/hmi/Ing** directory.
3. Open the copy in the editor and enter the appropriate data.
4. Save the text file.
If you insert foreign language text, save the file with the appropriate language code in the file name. The file for the English user interface is "oem_sljk_eng.ts" for example. Use the language code listed in the "Supported languages" section for the relevant language.
5. Restart HMI sl.

"oem_sljk_eng.ts" sample text file

```
<?xml version="1.0" encoding="utf-8"?>
<!DOCTYPE TS>
<TS>
  <context>
    <name>SljkLabels</name>

    <!-- Alias names for machine axis (%a1, %a2, etc.) -->
    <!-- Don't change the text ID (JK_AXISNAME_1, etc.) -->
    <message>
      <source>JK_AXISNAME_1</source>
      <translation>X</translation>
    </message>
    <message>
      <source>JK_AXISNAME_2</source>
      <translation>Y</translation>
    </message>
    <message>
      <source>JK_AXISNAME_3</source>
      <translation>Z</translation>
    </message>
    <message>
      <source>JK_AXISNAME_4</source>
      <translation>A</translation>
    </message>
    <message>
      <source>JK_AXISNAME_5</source>
      <translation>B</translation>
    </message>
    <message>
      <source>JK_AXISNAME_6</source>
      <translation>C</translation>
    </message>

    <!-- User defined language dependent text (example) -->
    <message>
      <source>OEM_JK_TEXT</source>
      <translation>Hallo</translation>
    </message>

  </context>
</TS>
```

Note

PLC interface signals that are triggered via the softkeys of the machine control panel menus are edge triggered.

See also:

You will find additional information on the HT 8 in:

- Function Manual Basic Functions, basic PLC program (P3 sl)
- Operator Components and Networking Manual (IM5)
- HMI sl Operating Manual

See also

Supported languages (Page 126)

Appendix

A.1 Feedback on the documentation

This document will be continuously improved with regard to its quality and ease of use. Please help us with this task by sending your comments and suggestions for improvement via e-mail or fax to:

E-mail: <mailto:docu.motioncontrol@siemens.com>

Fax: +49 9131 - 98 63315

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SIEMENS

SINUMERIK 840D sl

Creating foreign language texts

Commissioning Manual

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Valid for control system
SINUMERIK 840D sl/840DE sl

Software
NCU System Software
with HMI sl

Version
1.4
2.1

11/2006
6FC5397-1DP10-1BA0

Safety Guidelines

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



Danger

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



Warning

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



Caution

with a safety alert symbol, indicates that minor personal injury can result if proper precautions are not taken.

Caution

without a safety alert symbol, indicates that property damage can result if proper precautions are not taken.

Notice

indicates that an unintended result or situation can occur if the corresponding information is not taken into account.

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

Qualified Personnel

The device/system may only be set up and used in conjunction with this documentation. Commissioning and operation of a device/system may only be performed by **qualified personnel**. Within the context of the safety notes in this documentation qualified persons are defined as persons who are authorized to commission, ground and label devices, systems and circuits in accordance with established safety practices and standards.

Prescribed Usage

Note the following:



Warning

This device may only be used for the applications described in the catalog or the technical description and only in connection with devices or components from other manufacturers which have been approved or recommended by Siemens. Correct, reliable operation of the product requires proper transport, storage, positioning and assembly as well as careful operation and maintenance.

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Disclaimer of Liability

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

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Introduction

1.1 General

Since the 1990s, Microsoft have put considerable effort into satisfying global demands for information processing and software development.

In addition to supporting as many languages as possible, one of the aims was to be able to support all languages with the same uniform operating system, as opposed to the language-specific versions of operating systems which were used before.

As part of these efforts, many of the system components and applications were gradually converted to the cross-language platform Unicode.

Although in many cases the user would have been completely unaware of this conversion process, in terms of the subjects discussed in this guide fundamentally different procedures need to be adopted depending on which version of the operating system is used.

The procedure recommended for Windows 2000/XP is much simpler than the one recommended for Windows 95/NT4. Therefore it makes sense to change over to the new systems. The guide for older systems is no longer being updated by the documentation department.

1.2 Prerequisites

Supplementary conditions

This document describes the procedure for generating a text with the following preconditions:

- The text is to be generated on a Microsoft Windows operating system (Windows XP).
- The text is to be generated in a language not identical to the language of the operating system (= default language).
- The present description uses German as the default language for all examples provided herein. However, the described procedure will work just as well with a different language as the default Windows language.
- The text is to be generated in a format known as a "text file", i.e., a file which does not contain any formatting such as font type, font size, underlining, etc. This means that, apart from the text characters, the file will only contain ASCII control characters such as Tab, CR and LF (tab indent, carriage return and line feed).
- The language of the text requires a different Windows code page to that of the default language, i.e., the target language does not belong to the same language family as the default language.

- The text file is to be coded using this code page, not as a Unicode file.
- The text should be generated as simply as possible: in particular, this means that if possible, no additional software should have to be installed.
- For the purposes of this guide, it is assumed that you have installed Microsoft Word 2003 (or a later version) and are familiar with using it.

Text types for HMI Embedded and HMI Advanced

The following text types can be changed in the individual systems:

Text types	Systems
Alarm texts Texts for "Expand user interface" Application texts for all operating areas incl. softkey texts	HMI Embedded
Alarm texts Texts for "Expand user interface" Texts for the "Help" function in the editor Machine data Softkey texts for all operating areas	HMI Advanced

1.3 Language families

A language family is a group of languages for which Microsoft operating systems use the same code page. Microsoft uses the term "language group".

Table 1-1 Language families

Language family	Windows code page	Languages
Central European	1250	Albanian, Croat, Polish, Romanian, Serbian (Latin), Slovakian, Slovenian, Czech, Hungarian
Cyrillic	1251	Bulgarian, Macedonian, Russian, Serbian (Cyrillic), Ukrainian, White Russian
Western	1252	German, English, Finnish, French, Indonesian, Icelandic, Italian, Dutch, Norwegian, Portuguese, Swedish, Spanish
Greek	1253	Greek
Turkish	1254	Turkish
Baltic	1257	Estonian, Latvian, Lithuanian
Japanese	932	Japanese
Chinese	936	Simplified Chinese
Korean	949	Korean
Chinese	950	Standard Chinese (Traditional Chinese)

Operating system and target language from the same language family

If the language of the operating system (e.g., German) belongs to the same language family as the target language (e.g., Portuguese), then some difficulties could possibly occur with the **input** of certain characters. However, there will be no problems **displaying** these characters with a simple text editor.

Remedy:

- Use the Windows "Character Map" tool
(see Section "Input via the Character Map") or
- or switch the keyboard
(see Section "Using a different keyboard assignment") or
- use the ALT+digit combination to enter these characters
(see Section "Numerical text input")

There should not be any further problems in this case. Use a simple text editor (e.g., Notepad) and save the texts in the usual way.

Section "Files with Word 2003" does not apply.

Operating system and target language from different language families

If the language of the operating system (e.g., German) does not belong to the same language family as the target language (e.g., Hungarian), difficulties will occur with both **inputting** and **displaying** the characters in a simple text editor (Notepad).

1.4 Tools

Standard version

This document describes the use of Microsoft Word 2003 and other tools which may not necessarily be installed on your PC.

You should have installed the following components:

- Microsoft Word 2003 (required)
- Windows XP: Language Support for East Asian characters
(necessary for these languages)
- Windows XP: Character Map (recommended)

Checking the installation of the Language Support for East Asian languages

To install the Language Support for East Asian languages, please refer to Section "Special considerations when working with East Asian languages".

1.5 Terms

Code page

A list of characters which forms the character set for one or more languages. A code which is unique within this code page is assigned to each of the characters in the list.

All of the code pages used in Windows share the ASCII range (codes 0 to 127).

A distinction is made between single-byte code pages and multiple-byte code pages.

In single-byte code pages (all European languages), each character is represented with a single byte. Accordingly, single-byte code pages comprise a maximum of 256 characters.

Multiple-byte code pages (Asian languages) contain both characters which are stored as a single byte and characters which are stored with two (or more) bytes. The shared ASCII range is contained as a range of single-byte characters.

There is a 1:1 assignment between Windows code page and language family.

The language families are listed in Section "Language families".

Diacritical characters

(diacritical = distinguishing)

In most cases, a relatively small supplementary character, which is attached to a letter to give the letter a specific stress, a specific pronunciation or even a new meaning.

Section "Special characters in different language families" contains a list of diacritical characters.

If the combination of basic letters and diacritical characters belongs in a language-specific alphabet, this combination is contained in the appropriate Windows character sets (code page, Unicode) as a separate character.

Use of diacritical characters

A diacritical character is used

- To designate the combined character (e.g., Ğ = G cedilla, Õ = O tilde),
- For the combined input, if there is no separate key that possesses the required combined character
(see Section "Using a different keyboard assignment"),
- In Vietnamese and Thai, for normal coding in text files,
- For output (only in typographically compound texts): Diacritical characters and basic letter are output separately, meaning that any combinations are possible, e.g., for ancient languages and phonetics.

In all the other cases, the combined letter is always considered as a compound unit.

In some cases, however, the combined letter is incorrectly referred to as the diacritical character.

Input Method Editor (IME)

An aid for inputting the CJK characters (CJK: Abbreviation for Chinese, Japanese and Korean).

Language family

A language family is a group of languages which uses the same code page. This requires the use of the same basic alphabet (e.g., Latin or Cyrillic), but it does not mean that the alphabet of all languages of this group is the same.

There is a 1:1 assignment between Windows code page and language family.

The language families are listed in Section "Language families".

Font files (TrueType fonts)

Windows XP does not use font files that are stored separated for each code page; instead it uses something known as "Big Fonts", which are fonts that contain the character set for several code pages, saving memory capacity for the common characters.

With Word 2003, the selection of characters from this total character set is performed via the Unicode coding, not via the code page coding. This makes it impossible to mix up characters with the same code in different code pages.

Default language

The term "default language" is used in this guide for the language of the operating system, i.e., German for a German Windows environment and English for an English Windows environment.

Default keyboard setting

Under "Control Panel" → "Regional and Language Options", in the tab "Languages", click under the heading "Text Services and Input languages" on the button "Details..." to reach the dialog box "Text Services and Input languages".

Here you can see the default keyboard setting in the "Settings" tab under the heading "Default Language and Region Support".

The default keyboard setting consists of a language property (left) and a keyboard assignment (right).

This language property of the default keyboard setting need not absolutely match the default language.

Text file

The term "Text file" is used to describe a file which does not contain any formatting (font type, font size, underscore, bold, italics etc.) or embedded objects (pictures, tables, graphics, footnotes etc.).

This means that, apart from the text characters, the file will only contain ASCII control characters like Tab, CR and LF (tab indent, carriage return and line feed).

The text characters are taken from a particular code page.

Occasionally, text files are also incorrectly referred to as ASCII files. This is only correct if a text file only contains ASCII characters (codes 0 to 127) and is therefore code page invariant.

Unicode

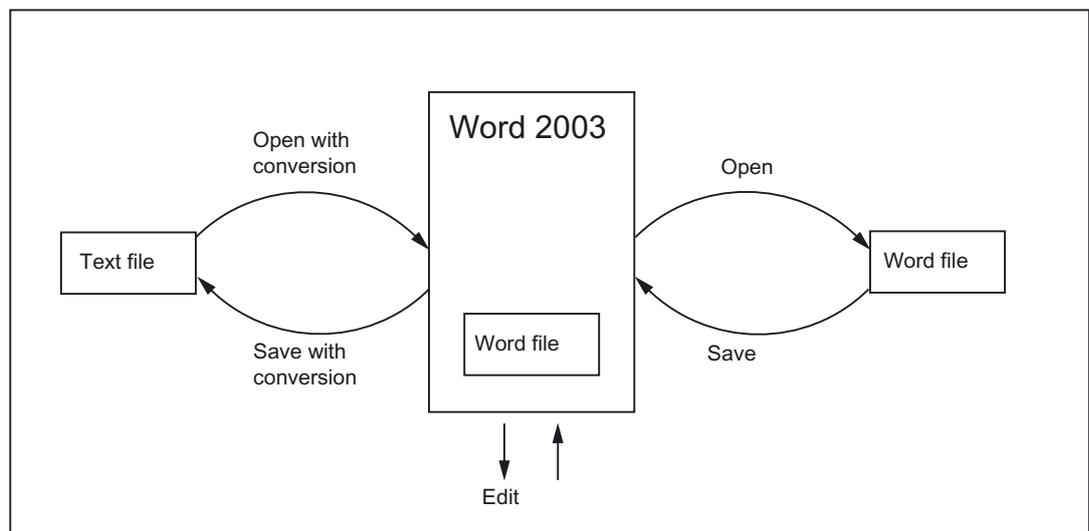
A 16-bit character set for which code pages are no longer required. All character codes are unique, without needing to specify the code page. Unicode programs like Word 2003 do not offer code page-dependent interpreting of characters and thus also cannot display characters differently by assigning a font or language property.

Editing files with Word

2.1 Overview

This section describes how text files can be edited using Microsoft Word 2003.

<p>Word 2003 does not edit text files directly. Instead, it converts them to Word files upon opening.</p> <p>During saving Word can then convert the edited text back into a text file.</p>	<p>We recommend saving an additional version of the text file as a Word file and using this version as the basis for future editing.</p> <p>It is then no longer necessary to open and convert the file.</p>
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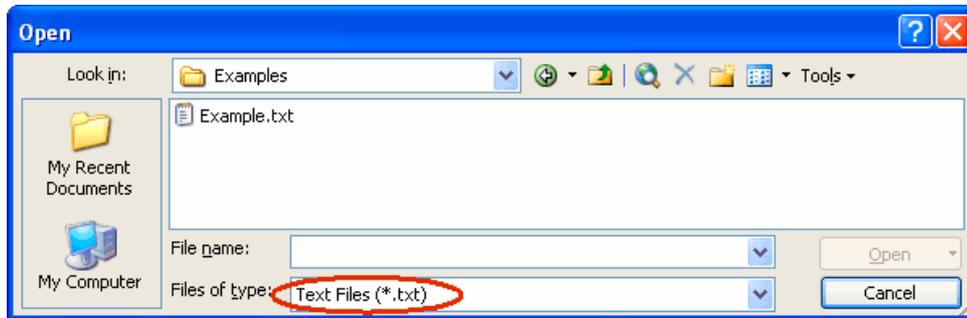


2.2 Generating a new text file

- You can create a new text file as follows:
 - In Windows Explorer, click the command "File" → "New" → "Text Document".
 - Launch Notepad without a file. A new empty file is then opened. Then select the command "File" → "Save As" → "Encoding: ANSI"
 - Make a copy of an existing text file you wish to use as a template for the new text file.
- Now open the text file with Word 2003 in the way described in the next section.

2.3 Opening an existing file

1. In Word 2003, select "Open..." from the "File" menu.
2. From the "Open" dialog box, choose the "Text files" (*.txt) setting under "Files of type". If your file has a different extension from "txt", you must rename it.



3. Choose the file you would like to open and click "Open".
Instead of steps 1-3, you can also use one of the standard shortcuts:
 - In Word you can use the list of the recently used files.
 - Drag and drop the text file from Explorer to the Word icon on your desktop.
 - If Word has already been launched, drag and drop the text file from Explorer to the title bar of the Word window.

4. Note what happens next.

Continue with "Convert File" (see point 5.) if this dialog box opens.

Continue with "File Conversion" (see point 6.) if this dialog box opens.

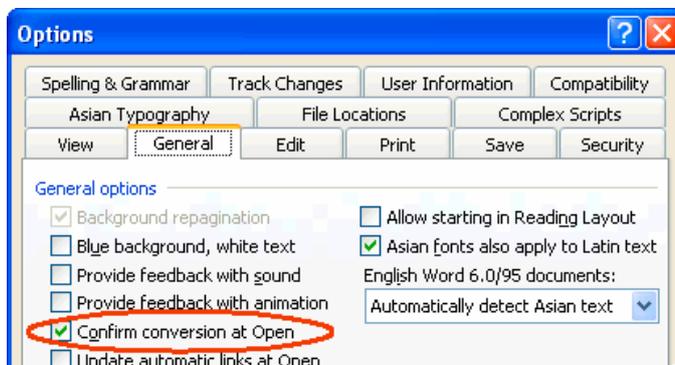
If, however, the file is opened straightaway with neither the "Convert File" nor the "File Conversion" dialog boxes opening up, then Word has probably opened the file incorrectly under the assumption that the text has been written using the default language.

Be careful with special characters. The special characters will appear incorrectly if the code page of the text file is not the same as the code page of the default language.

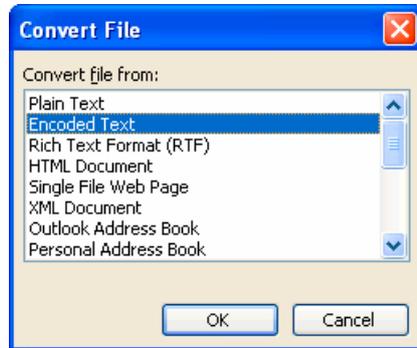
In this case, go to "Extras" → "Options..." and open the Options dialog box for Word. Click "General" and select the option "Confirm conversion at Open".

When this option is active the additional dialog box "Convert File" (see point 5.) will appear every time, but when the option is inactive it is skipped.

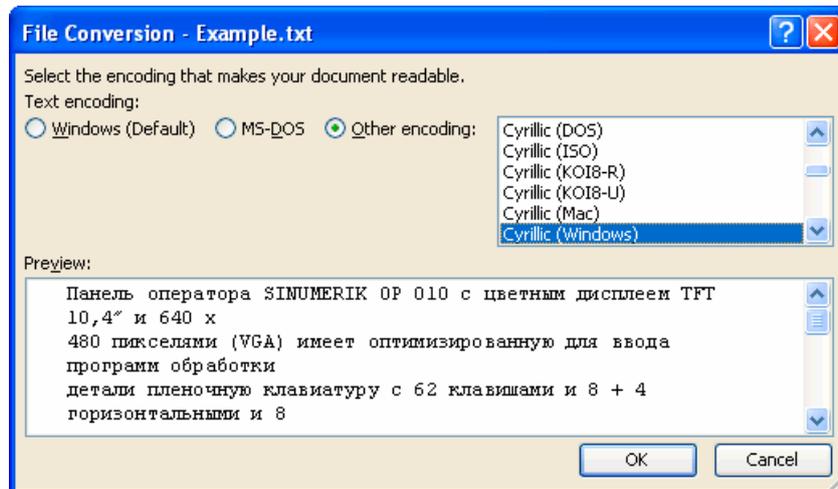
Afterwards close the file and start again from point 1.



5. The "Convert File" dialog box will appear.
Select "Encoded Text" and click "OK".



6. The "File Conversion - Example.txt" dialog box will then appear:
 - If "Windows (default)" is selected, activate "Other Encoding". Select the correct encoding (Word will make a suggestion, which will not necessarily be correct).

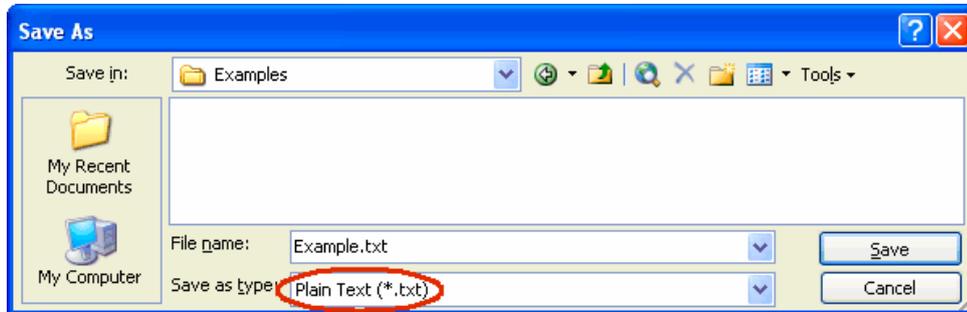


- Section "Codes for SINUMERIK HMI", Table 2-1 lists the suitable encoding options. Check the preview area while doing this.
7. Click "OK".
The file is opened and converted to a Word file at the same time.
The existing text is formatted using a default font.

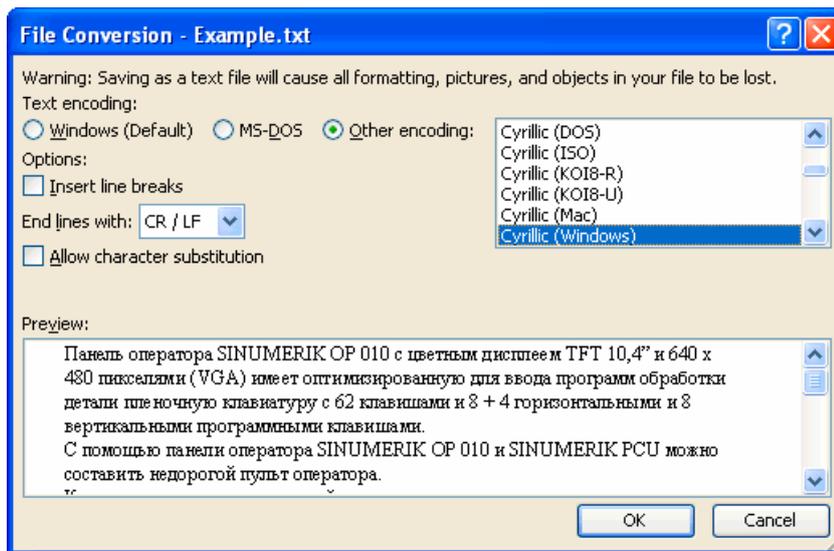
2.4 Saving text files

Save the text entered as a "Text File":

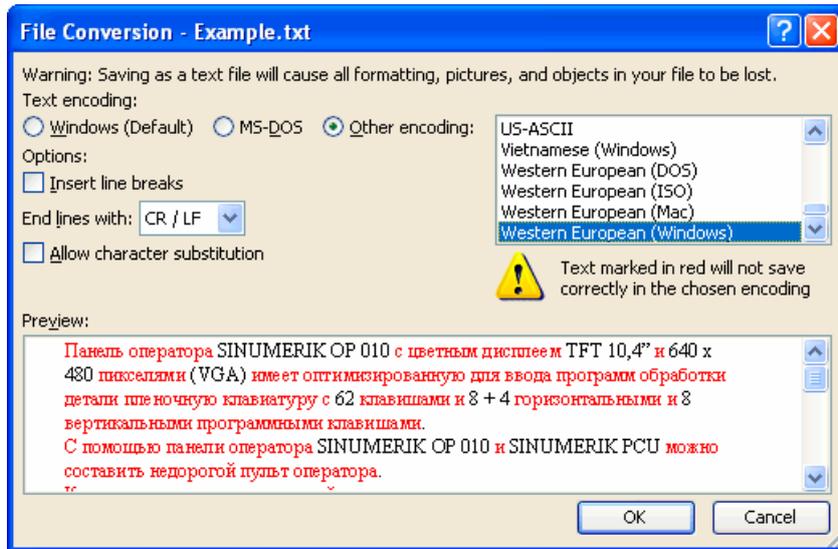
1. In Word, select "Save As..." from the "File" menu.



2. Choose the option "Text Only (*.txt)" under "Save as type".
3. Enter the name of the file in the "File name" box and click "Save".
 - The "File Conversion" dialog box will then appear.



- Select the encoding which is suitable for your target language and click "OK". Section "Codes for SINUMERIK HMI", Table 2-1 lists the suitable encoding options.
- Your file is now saved as a text file and encoded using the selected code page in the process.
- If you have selected a completely unsuitable code then a warning is displayed in the dialog box. This warning will also appear if you have selected the correct code but your file contains characters which are not permitted, such as Latin mutated vowels in a Cyrillic text.



- If you choose to ignore the warning, then all characters which cannot be encoded are replaced with a question mark.

2.5 Codes for SINUMERIK HMI

When you open or save a file, code page names are used rather than code page numbers, see Section "Opening an existing file" or "Saving text files".

Depending on the installation of your system, many other codes may be listed, including those for Unix (ISO), Apple (Mac), OEM (DOS) and IBM (EBCDIC) platforms.

Please use the Windows (ANSI) codes for SINUMERIK HMI.

Use the following codes to open and save files (shown in alphabetical sequence in accordance with the Word listing):

Table 2-1 Encoding

Description	Code page
Traditional Chinese (Big5)	950
Simplified Chinese (GB2312)	936
Japanese (Shift-JIS)	932
Korean	949
Cyrillic (Windows)	1251
Central European (Windows)	1250
Turkish (Windows)	1254
Western European (Windows)	1252

Input of Text

3.1 Special characters in different language families

Latin language family

With the Latin-based language families (Baltic, Central European, Turkish, Western), you can enter most of the characters, i.e., the basic Latin alphabet, directly with your (e.g., Western) keyboard.

Most of the special characters, such as ÅáâãçđéèíĹŃňőóÔťŨū, are made up of the Latin letters A-Z a-z and diacritical characters such as acute ´, breve ˘, cedilla, circumflex (caret) ^, point ` , colon (dieresis, trema) ¨, double-acute ˇ, grave accent ` , háček (caron) ˇ, macron ¯, ogonek (nasal hook, crooked hook) ˛, squiggle ˆ, slash /, hyphen – or tilde ~.

Other characters of the alphabet are special letters (þ, ð, ß) or ligatures (Ææ, Œœ, Ijij). These are supplemented by language-specific abbreviations and punctuation marks, e.g., for the endings of the ordinal numbers in Spanish (ª and º) as well as the upside-down exclamation and interrogation marks (¡ and ¿).

The input methods described in the following will apply without restrictions to the Latin-based language families.

Greek/Cyrillic language family

Certain special considerations need to be taken into account when inputting texts using Greek or Cyrillic fonts.

Read Section "Special considerations when working with Greek and Cyrillic texts" for additional information.

East Asian languages

Certain special considerations also need to be taken into account when generating texts in Japanese, Chinese or Korean.

Read Section "Special considerations when working with East Asian texts" for additional information.

Disruptive Word options

Deactivate the following options in Word to prevent unwanted characters from reaching the text:

In the dialog box "Tools" → "AutoCorrect Options" go to the "AutoFormat as you type" tab and under "Replace as you type" check:

- "Straight quotes" with "Smart quotes"
- English ordinals (1st) with superscript
- Fractions (1/2) with fraction character (½)
- Special characters (--) with symbols (—)

"Apply as you type":

- Automatic bulleted lists
- Automatic numbered lists

If you do leave any of the options active then you can always use Ctrl+Z to undo any automatic corrections. As a general rule this will give the same results as if the option was deactivated.

3.2 Inputting characters via the Character Map

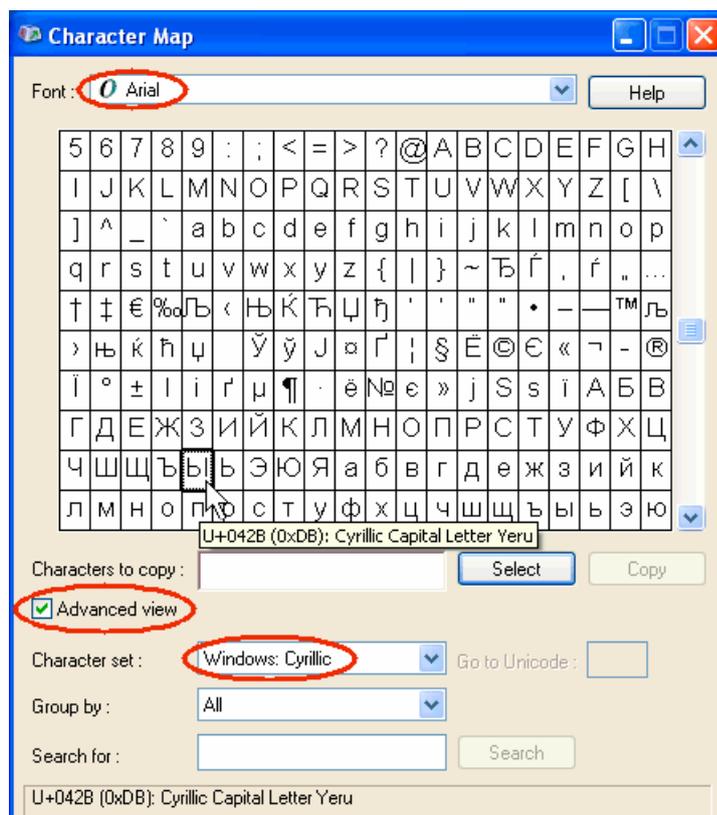
Note

The Character Map integrated in Word (menu commands "Insert" → "Symbol...") is not suitable for generating code page-encoded text files, as it cannot be limited to the relevant code page.

Use the "Character Map" system program as described below.

Selecting the Character Map

1. In the start menu:
select "Programs" → "Accessories" → "System Tools" → "Character Map" to start the "Character Map" tool.
2. From "Font", choose the same font type as you have selected for the text file.



3. Activate the box "Advanced view".
4. Under "Character set" select the code page for your text file in order to restrict the number of available characters to this code page.

The code pages are referred to as follows:

Table 3-1 Text file coding

Description	Code page
Windows: Chinese (Taiwan)	950
Windows: Chinese (PROC)	936
Windows: Japanese	932
Windows: Korean	949
Windows: Cyrillic	1251
Windows: Eastern European	1250
Windows: Turkish	1254
Windows: Western	1252

Inputting characters

1. Choose a character you want to input.

The information bar at the bottom will display the Unicode code (U+..., hexadecimal), the code page code (in brackets) and the clear text description of the character.

If you have set up the keyboard assignment accordingly (see Section "Using a different keyboard assignment"), the keystroke combination for entering the character numerically will appear at the bottom right in the status bar (see Section "Numerical text input").



2. Click "Select".

The character is copied into the "Characters to copy" field.

3. Repeat steps 1 and 2 for further characters.

4. After you have selected all the characters, click "Copy".

The characters are copied from the "Characters to copy" field to the clipboard.

5. Switch back to Word and press Ctrl-V.

The character is copied from the clipboard to the text.

3.3 Compound input

With many of the compound special characters it is possible to input the diacritical character first and then the letter. The diacritical character will not appear at first and is then combined with the letter to form a special character.

Example

With a German keyboard assignment, press, for example, the keys ' (acute) and "a" one after the other to obtain the character á (a-acute).

The keys with the diacritical characters, which are thus dealt with in a special way, are marked with a special color in the descriptions of the keyboard assignments.

Keyboard assignments

The table below shows some keyboard assignments for the supported diacritical characters:

Keyboard assignments	Acute	Grave	Circumflex	Háček	Breve	Ogonek	Point	Colon	Cedilla	Double acute	Squiggle	Tilde
	'	`	^	ˇ	˘	ł	·	ː	¸	˝	ˆ	~
German	X	X	X									
French		X	X					X				X
Polish	X		X	X	X	X	X	X	X	X	X	
Spanish	X	X	X					X				X
Czech	X		X	X	X	X	X	X	X	X	X	
Hungarian	X		X	X	X	X		X	X	X	X	
U.S. International	X	X	X					X				X

Obtain a graphical representation of your keyboard assignment to learn which key combinations produce the diacritical characters.

Keyboard assignment in picture form

Images of the keyboard assignments can be obtained from Microsoft via the Internet at the following address:

<http://www.microsoft.com/globaldev/reference/keyboards.msp>

If you press the space bar after the diacritical character, you will see the character itself.

Note

It can be useful to switch the keyboard assignment to "U.S. International" which corresponds mainly to the American keyboard, but additionally contains 5 diacritical characters and provides many special characters.

3.4 Using a different keyboard assignment

Necessity of changing the keyboard assignment

When is a change in the keyboard assignment necessary?

- If you have to input a lot of text.
- Your translator, who is used to a certain language-specific keyboard, wants to use your PC.

However, if you (as a German) only need to make smaller changes to existing files, then the German keyboard assignment may be enough, provided there are only a few special characters which cannot be represented with the German keyboard. You can enter these characters using the Character Map.

Example

In Hungarian, for example, you would have to input these characters as follows:

- őŰűŰ (O double-acute, U double-acute) via the Character Map
- öÜüÜ directly
- áÁéÉíÍóÓúÚ compound input

3.4.1 Concept of the keyboard language

Windows manages pairs for the keyboard consisting of "Language ("Language and Region Support")" and "Keyboard assignment". The set keyboard language determines which language property is assigned to the characters entered. The associated keyboard assignment will determine which key produces which character.

Several such settings can be set up and it is possible to switch between them. One of the settings is defined as the default setting.

Windows uses the term "Language and Region Support" as this can be used not only to switch the language properties, but also to select settings such as currency, date format etc.

3.4.2 Setting up a keyboard assignment in Windows XP

Proceed as follows to select a new keyboard assignment:

1. From the Start menu, select "Settings" → "Control Panel" and click "Regional and Language Options".
2. Click the "Languages" tab and click the button "Details..." under the heading "Text Services and Input Languages".

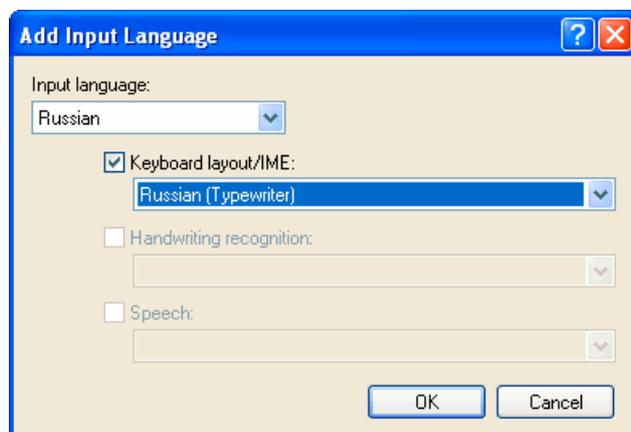
If a symbol such as **DE** is displayed in the right-hand taskbar, you can also right-click this symbol and select the command "Properties..." to speed up steps 1 and 2.

3. The dialog box "Text Services and Input Languages" is opened. Select the "Settings" tab.



4. Click "Add".

The dialog box "Add Language and Region Support" is opened.



5. In the dialog box "Add Language and Region Support", select a language under "Language and Region Support" and the associated keyboard assignment under "Keyboard Assignment".

The language ("Language and Region Support") may also be the same as the default language or as some other language for which you have already set up a keyboard assignment. However, in this case you will not be able to make such a good distinction between the two keyboard assignments, as Windows usually only displays the language ("Language and Region Support").

6. Click "OK". The dialog box "Add Language and Region Support" is closed. You then return to the "Text Services and Input Languages" window.
7. Use "Keyboard..." to select the way in which you want to switch the keyboard assignment. If you select "none", you can only switch using the mouse.
8. Under the "Language and Region Support" bar you can select whether and how the current keyboard assignment is displayed in the taskbar or in a special button bar.
9. Click "OK" to quit the dialog box.

3.4.3 Use

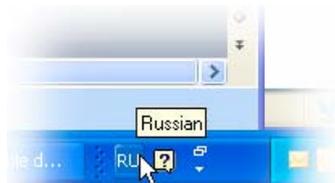
You can now create text with a "keyboard assignment" suitable for the target language (for the input of your texts in a foreign language) or with your previous default keyboard assignment (for the remaining operation). You can switch between the two assignments as required.

Now, a small blue field with a two-letter language abbreviation should appear in the taskbar for the language you have set:

If you position the mouse pointer on this field (without clicking it), the setting is displayed .

If the selected keyboard assignment is the default assignment for the selected language (e.g., "Turkish" – "Turkish Q"), then only the language ("Turkish") is displayed.

Otherwise, the complete settings with language and keyboard assignment will be displayed ("Turkish – Turkish F").

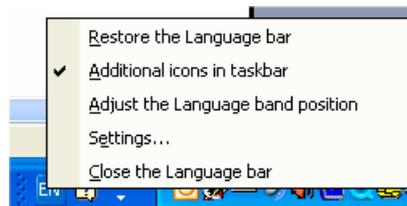


If you click this field with the **left** mouse button, the languages you have set will be offered in a small menu.

The current setting is marked by a check mark.



If you click this field with the **right** mouse button, an abbreviation of the dialog box "Keyboard Properties" is displayed above the "Properties" menu option.



Among further settings that are offered is the ability to arrange this display as an Input language bar independently of the taskbar: at the top edge of the screen, for example.

Keyboard assignment specific to input window

The Windows operating system will memorize the current keyboard assignment **for each input window**.

- The keyboard assignment is switched automatically if you switch to another window. A new window is always started with the default setting. After starting Word, you may have to reselect the keyboard assignment.
- Enable the window in which you want to input texts before you select the keyboard settings for this window.

Menu operation

All menus in the active program will also use the changed keyboard assignment. You will possibly no longer find certain key combinations with Alt and the letter key or Ctrl with a letter key, or even initiate a wrong command by mistake. You should therefore use the mouse or, in menus, the arrow keys.

Note

If you do not want to switch back to the other keyboard assignment quite so frequently, you can also declare the new combination with the special keyboard assignment to be the default target language in the "Text Services and Input Languages" dialog box by selecting Start menu "Settings" → "Control Panel" → "Regional and Language Options" → "Languages" tab:

Select the new setting under "Default Language and Region Support".

Please note that all new windows, the Start menu and the desktop will now also use the new keyboard assignment.

Keyboard assignment in picture form

You can obtain the keyboard assignment in picture form.

For appropriate Internet addresses, see Section "References for text generation"

Checking the keyboard assignment

Compare the keyboard assignment and note a key with two different assignments. If you are not sure, press this key when inputting the text to test which assignment is active.

Example: If the German keyboard assignment is active, pressing key "1" (letter group) will produce a "1" and if the Czech keyboard assignment is active, a "+".

Note

Check whether the automatic option for switching over the keyboard has been activated in Word. Inadvertent switching of the keyboard assignment by Word can cause confusion.

Section "Multi-language Word files" describes situations in which the automatic keyboard switching function is useful and how to activate and deactivate it.

3.5 Numerical text input

You can only use numerical input with Word if you have selected a suitable keyboard assignment (see Section "Using a different keyboard assignment").

Press the ALT key, and while holding down the key, enter zero and then the three-digit decimal coding of the desired special character on the numerical key group. Only then release the ALT key.

Example (Turkish):

ALT+0222 results in Ş (S with cedilla).

To produce this character, you will only need the Character Map of the appropriate code page (see Section "Language families").

Section "Input via the Character Map" also describes where the key combination is displayed in the "Character Map" tool.

Overview tables of the code pages

You will find overview tables of the code pages at, e.g., Microsoft under:

<http://www.microsoft.com/globaldev/reference/WinCP.msp>

From these tables, combine the headers for the column and row (hexadecimal 00 to FF) and convert this number to form a decimal number (0 to 255).

The 4-digit hexadecimal numbers contained in the individual table fields are the corresponding Unicode codes which can be used for identification of a character, but they cannot be used for numerical input of that character.

3.6 Language properties in Word files

Language property

The language is a property (attribute) that is managed separately in Word for each character, in the same way as other text properties (bold, underline, etc.):

- In the language properties, Word will remember the language to which the character, the character sequence, the word or the whole sentence belongs.
- The language property is independent of the font. For example, a Cyrillic character can possess the language property "German".
- The language property is managed internally as a combination of main language and sublanguage, e.g., "French (Canada)".

Microsoft sometimes uses the designation "Region scheme" for the language property: this term also covers properties such as currency, date format, decimal separators etc.

Effects of the language property

This property is used (evaluated) for the spell checker and for automatic keyboard switching (see Section "Multi-language Word files").

If you do not wish to use either the spell checker or the automatic keyboard switching function, there is generally no need to worry about the language properties. In this case, do not forget to deactivate the automatic keyboard switching function.

Saving the language property

Microsoft Word saves this property in Word files (*.doc). If a document is saved as a text file (*.txt) then this property is lost along with the other text properties.

If you wish to use the language property, it therefore makes sense to use a Word file to edit the texts and to keep it for subsequent changes. Whenever you reach a stage where you want to stop editing, you can save the document as a text file following the procedure described in Section "Saving text files".

Displaying the language property

In Word, the current language property is displayed in the status bar at the bottom edge of the window.



Setting the language property

Proceed as follows to set the language property for a text:

1. Highlight the part of the text for which you wish to set the language property, or press CTRL+A to select the entire text.
2. Then select the command "Extras" → "Language" → "Set Language...".
3. In the "Language" dialog box you can choose the correct language. Click "OK" when you are done.

Quick setting of the language property

In Word, you can insert a combined display and selection box into a symbol bar. This both displays the current language property and enables you to set the language as well.

Proceed as follows to insert this field into a symbol bar:

1. In the "Extras" menu, select the command "Customize..."



2. In the "Customize" dialog box select the "Commands" tab.
3. Select "Tools" from the list of categories on the left.
4. Then select "Language" from the list of commands on the right (see Fig.).
5. Drag and drop this entry with the left mouse button into a symbol bar.



6. Close the dialog box.

With this selection box, you can then change the selected language for any part of the text.

Default setting of the language property

Word automatically sets the language property in the following situations:

- When opening a file of type "Encoded Text File" (see Section "Opening an existing text file").
- New text entered with the keyboard is automatically assigned the selected keyboard language.
- If the "Detect language automatically" option is selected, Word will try to assign the words entered to a language once they are complete and then automatically sets the language property.

Note

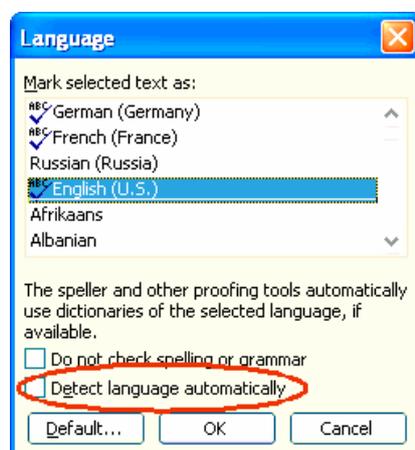
The "Detect language automatically" option can often deliver confusing results, particularly in technical texts.

This option is usually activated as a default setting.

Recommendation: Deactivate the "Detect language automatically" option.

Proceed as follows to deactivate the "Detect language automatically" option:

1. Make sure that no part of the text has been highlighted and select the command "Tools" → "Language" → "Set Language..."
2. In the "Language" dialog box, deactivate the option "Detect language automatically" and click "OK".



3.7 Multi-language Word files

In certain cases it may be useful to deliberately set different language properties for different parts of the text in a Word file.

Supplementary conditions for multi-language Word files

You want to enter certain parts of the text with the German keyboard assignment and then also edit these parts later on with the German keyboard assignment, whereas other parts of the text are to be generated and edited with the keyboard assignment of the target language.

Table with two language properties

To generate a multi-column text in which, for example, the first column possesses the language property "German" and the second column "Russian", for example, you can proceed as follows:

- Switch to the German keyboard and enter the first column of the first line. Then switch to the Russian keyboard and enter the second column:
[Text 103][Mode 28] "йцукенгшщзхъфывапроджэячсмить"
- This does not need to be a Word table with borders and fields. You can also use a simple line and separate the different parts with spaces.
- Select the whole line, copy this to the clipboard by using Ctrl-C and paste this line several times by pressing Ctrl-V. This will give you two columns with German on the left and Russian on the right.

[Text 103][Mode 28]	"йцукенгшщзхъфывапроджэячсмить"

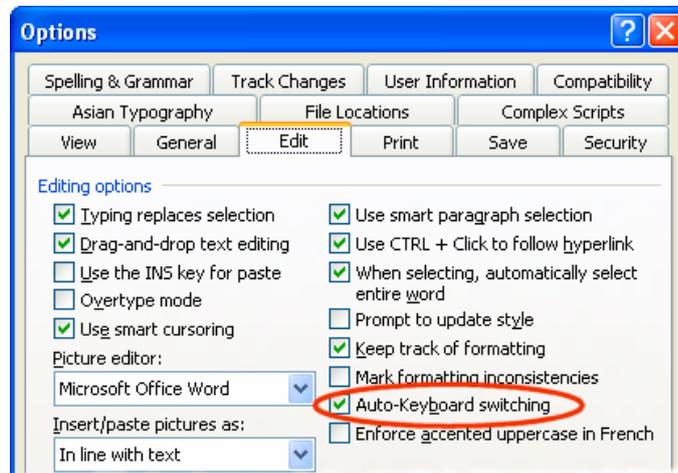
Examples

This can be necessary in the following cases:

- With Greek and Cyrillic texts, the Latin letters and other ASCII characters are missing in the appropriate keyboard assignments.
- With some keyboard assignments such as Czech, no access to the digits is granted on the standard keyboard level.
- The arrangement of the Latin letters deviates substantially from the arrangement to which you are accustomed (e.g., Turkish-F keyboard assignment).
- You, as a German, want to prepare one part of the text, and a second part is to be generated by your translator.

Automatic keyboard switching

In order to automatically have the correct keyboard assignment when working on different parts of the text, in Word go to "Tools" → "Options" and activate the "Auto-Keyboard switching" option in the "Edit" tab.



Note

Accidental use of the automatic keyboard switching function can be confusing. Only use this option when the aforementioned supplementary conditions are met.

Active keyboard assignment always visible

To make sure you know what is going on, you can adjust the taskbar to always display the currently active keyboard assignment.

1. Right-click the taskbar and select "Properties".
2. Activate the "Always keep the taskbar on top" option.
3. Deactivate the "Automatically hide taskbar" option.

You are also free to position the Language and Region Support bar anywhere you want on the screen. To do this, click the button for switching over the keyboard (e.g., DE) in the taskbar and select "Restore Language and Region Support Bar".

Another option is to activate keyboard switching in Word:

1. In the "Extras" menu select the command "Customize..."



2. In the "Customize" dialog box select the "Commands" tab.
3. Select "Format" from the list of categories on the left.
4. Then select "DE Keyboard Language" from the list of commands on the right (see Fig.).
5. Drag and drop this entry with the left mouse button into a symbol bar.

3.8 Special considerations when working with Greek and Cyrillic texts

Note

If you are generating texts in the Greek or Cyrillic language for the first time, then you MUST read this section!

From the point of view of the language sciences, the Greek and Cyrillic alphabets are considered as separate and independent alphabets, and not, for example, as an extension of the Latin alphabet.

This means that Greek and Cyrillic letters which, in their appearance, are identical to Latin letters, are not the same characters and may therefore also not be coded identically.

In some cases, this becomes evident by the fact that although certain letters look the same in upper case, the corresponding lower case letters look different.

Font	Name	Meaning
Latin	P, p	Latin letter P
Greek	Ρ, ρ	Greek letter RHO
Cyrillic	Р, р	Cyrillic letter ER
Latin	H, h	Latin letter H
Greek	Η, η	Greek letter ETA
Cyrillic	Н, н	Cyrillic letter EN

Example

Incorrect coding could have the following consequences:

Let us suppose that you wrote the Russian word for "NO" ("HET") using Latin letters instead of "HET" using Cyrillic letters. Initially you would see no difference. However, a search for "нет" in lower case letters with the search option "Ignore uppercase/lowercase letters" would not find the incorrectly coded spelling.

Keyboard assignment for Greek/Cyrillic font

For this reason, the keyboard assignments for the Greek and Cyrillic fonts have been designed in such a way that the Latin letters are not available at all, not even via AltGr key combinations. These keyboard assignments have normally only two levels (standard and SHIFT).

Keyboard assignment for the Russian font

In the Russian keyboard assignment, there are also some ASCII special characters which are missing, such as # \$ [] { } | ~ & .

For these languages it makes sense, therefore, to use Word files with two languages, as described in Section "Multi-language Word files".

Note

- Switch the keyboard to Latin only if this is absolutely necessary! When doing so, do not switch over for individual letters, but only for complete words and sentences.

Never use words with mixed codings!

- Find out whether and to what extent certain German, English or international abbreviations (e.g. DIN/ISO) may or must be written using Latin fonts, or whether a conversion (ДИН/ИСО) is more appropriate, according to the conventions of the country in question.

The key assignment for combinations, such as Ctrl-C, Ctrl-V, Ctrl-Z, Alt-A, etc. normally follow the US keyboard assignment.

3.9 Special considerations when working with East Asian texts.

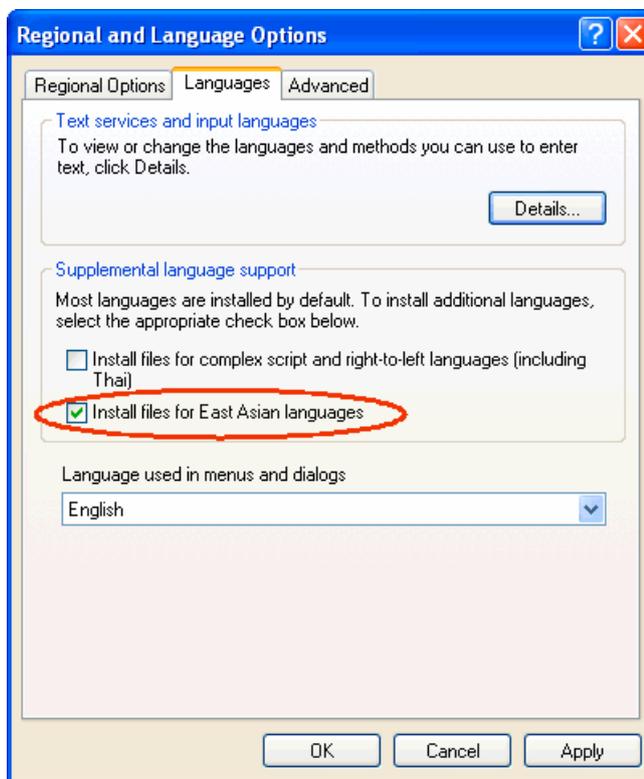
Requirement

To author or correct texts in Japanese, Chinese or Korean, you will need to have installed the corresponding expansion package for the operating system.

Checking the system installation

Open the dialog box "Regional and Language Options" via "Start" → "Settings" → "Control Panel".

Check the "Languages" tab to see whether the option "Install files for East Asian languages" has been selected.



You will not usually need the installation CD to reinstall the files for East Asian languages in Windows XP, as the files are already present on the hard drive in compressed form.

You will, however, require Administrator Rights to perform the installation.

Input

An Input Method Editor (IME) is used for inputting. This is a tool which is used to put together the pictograms on a European keyboard and can be activated analogously to a keyboard assignment.

You will normally need a translator who speaks the target language as his/her mother tongue to operate the IME system.

There is no need to have a Windows operating system in the target language.

Full-width European characters

In the code pages for the East Asian languages, two versions of many of the European characters (Latin letters, numbers and the characters # \$ % & etc.) are included:

- In the normal (narrow, half-width) version.
This is the set of ASCII characters which is compatible with European code pages.
- In a double-width (full-width) version.
These versions of the characters are twice as wide and are not compatible with the ASCII characters.

If you are using characters with a functional significance it is important to use the ASCII versions.

Correct example (SINUMERIK alarm text, Japanese):

014195 0 0 "DコードとG49が同時に指令されています (Ch%1 %2)"

The circled characters are:

014195 0 0	Identifier and attributes
Space character	Syntactical separator
Inverted commas	Text delimiters
%1, %2	Parameter variables

Only the ASCII versions must be used for these characters.

Note

In the remaining part of the text it is quite acceptable to use full-width characters for better readability (as in the example here for G49).

Notice

There is even a full-width version of the space character (ideographic space). You can only recognize this character from its width by selecting it.

Incorrect example:

014195 0 0 "DコードとG49が同時に指令されています (Ch%1 %2)"

The circled characters are full-width variants which have been used incorrectly.

Note

When placing a translation order, tell the translator that only the narrow, ASCII-compatible characters must be used for characters with a functional significance.

Simplified/traditional Chinese

Please make a careful distinction between simplified Chinese and traditional (or standard) Chinese. The former is used in the PR of China, whereas the latter is used in Taiwan. These two variants are coded differently and therefore have to be treated differently. You should therefore also make sure that this is clearly specified in your translation order.

Generating texts

When you are generating texts in Japanese, Chinese or Korean, it definitely makes sense to initially create a Word file.

There should be no problems if you are using Word 2003 to exchange documents with your external translator.

Afterwards, you can convert this Word file into a text file in the way described in Section "Saving text files".

Problems and remedies

Keyboard assignment switches unintentionally

Problem:

The keyboard occasionally switches to a different assignment while text is being entered, without this being explicitly requested.

Remedy:

Check whether the option for automatic keyboard switching is set as described in Section "Multi-language Word files". Deactivate this option.

Language properties are changed inadvertently

Problem:

After creating a text with certain keyboard assignments (e.g., Polish), you notice that parts of the text have German or English as the language property.

Remedy:

Deactivate the automatic language recognition option as described in Section "Language properties in Word files".

Hotkeys no longer work

Problem:

Certain commands (Ctrl+C, Alt+T etc.) no longer work.

Remedy:

As a result of a different keyboard assignment, the keyboard shortcuts for certain commands have changed. Use the mouse while you are working with the other keyboard assignment.

Individual texts not working

Problem:

In some cases, the finished text files do not work in the SINUMERIK Runtime system. Individual texts or lines of text are obviously not being read correctly.

Remedy:

Check the formal text criteria:

Are all of the characters which have a functional significance correctly encoded?

- If inverted commas are a requirement, check whether Word has converted the straight inverted commas (ASCII characters) that were entered into typographical inverted commas. Some disruptive Word options are listed in Section "Special characters in different language families".

- If the texts in question are East Asian texts, check the coding of the non-Asian characters. See Section "Special considerations when working with East Asian texts".

If full-width characters have been used for functional characters, replace them with the corresponding ASCII variants.

Yen character (Japanese) or Won character (Korean) in the text

Problem:

The translator has obviously used a Yen character ¥ or a Won character ₩ wherever you would expect a backslash “\”.

Remedy:

This is not necessarily a mistake. Instead, this has historic reasons. For many years the Yen character has been used in Japan and the Won character in Korea in place of the backslash character.

This representation was kept once the PC users in those countries had got used to using this representation in path names (where you would otherwise expect the backslash character). However, internally this is still the backslash character.

In the fonts "MS Gothic" (Japanese) and "Batang" (Korean) the backslash symbol is represented as a currency character.

However, it is also possible that the Yen character (Unicode U+00A5) or Won character (Unicode U+20A9) was actually entered instead of the backslash character (Unicode U+005C). To check this, proceed as follows:

1. Reformat the text in Word using a different font, e.g., "Courier New". If you see the backslash character in its normal representation, there are no problems.
2. However, if you can still see the currency symbol or a symbol which is not a valid symbol, you should correct the character and replace it with a backslash.
3. Afterwards, revert back to the normal font (MS Gothic or Batang).

References for text generation

For further information about generating texts, please refer to:

- Book: *Developing International Software, Second Edition*
Microsoft Press, October 2002, ISBN 0-7356-1583-7
http://www.microsoft.com/globaldev/getwr/dis_v2/default.aspx
- Overview tables of the Microsoft code pages
<http://www.microsoft.com/globaldev/reference/WinCP.aspx>
- Pictures of the keyboard assignments in Microsoft can be found at the following address:
<http://www.microsoft.com/globaldev/reference/keyboards.aspx>
- Windows XP FAQs:
<http://www.microsoft.com/globaldev/DrIntl/faqs/winxp.aspx>
- Microsoft Global Software Development
Detailed explanations on various aspects of international software
<http://www.microsoft.com/globaldev>
- Unicode
Tables, definitions, standards and tools
<http://www.unicode.org>

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SIEMENS

SINUMERIK 840D sl

NCU Operating System (IM7)

Commissioning Manual

Commissioning a System

1

Backing up and Restoring
Data

2

Service Commands

3

Appendix

A

Valid for:

NCU System Software Version 2.5

01/2008

6FC5397-1DP10-3BA0

Safety Guidelines

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

 DANGER
indicates that death or severe personal injury will result if proper precautions are not taken.
 WARNING
indicates that death or severe personal injury may result if proper precautions are not taken.
 CAUTION
with a safety alert symbol, indicates that minor personal injury can result if proper precautions are not taken.
CAUTION
without a safety alert symbol, indicates that property damage can result if proper precautions are not taken.
NOTICE
indicates that an unintended result or situation can occur if the corresponding information is not taken into account.

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

Qualified Personnel

The device/system may only be set up and used in conjunction with this documentation. Commissioning and operation of a device/system may only be performed by **qualified personnel**. Within the context of the safety notes in this documentation qualified persons are defined as persons who are authorized to commission, ground and label devices, systems and circuits in accordance with established safety practices and standards.

Prescribed Usage

Note the following:

 WARNING
This device may only be used for the applications described in the catalog or the technical description and only in connection with devices or components from other manufacturers which have been approved or recommended by Siemens. Correct, reliable operation of the product requires proper transport, storage, positioning and assembly as well as careful operation and maintenance.

Trademarks

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Disclaimer of Liability

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

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Commissioning a System

1.1 Delivery condition of the system

Scope of validity

This document is valid for all systems that are supplied with Linux as operating system on the CF card, such as all NCUs of the type NCU 7x0, PCU 321 etc.

Structure and contents of the CF card

A Linux partition as well as a FAT partition are available on the CF card. The memory space of the CF card is occupied mainly by the LINUX EXT3 partition containing the system software and the user data. A 2MB large FAT partition still exists but only for internal administration purposes.

When the system is in operation, the following directories (this is a selection and not a complete list) are available in the EXT3 partition on the CF card:

Directory	Use
/siemens	Reserved for Siemens system software
/addon	Reserved for Siemens add-on software
/oem	Additional software and configurations of the machine manufacturer
/user	<ul style="list-style-type: none"> • Storage of user data • Configurations of the HMI • Data that appear on the user interface when the machine is started up
/system	Linux operating system
/user/system/etc	File basesys.ini (modifications possible)
/user/common/tcu	TCU configuration files
/var/log/messages	System log file (same as event.log under Windows)

Files in the directory under /user always have priority over files with the same name in the directory /oem → /addon → /siemens.

CAUTION
Suitable editors for Linux
In most Linux system files, lines may only be ended with LF, and not with CRLF as in Windows. Please take note of this when selecting an editor. The editor of the internal HMI under "Start-up" is suitable.
In the Linux operating system, the UNIX Editor vi is available.
Please take note that the Linux operating system is case-sensitive.

Preset users

The following users have already been set up:

Users	Password	Target group
operator	---	Operators, users
user	CUSTOMER	Operators, users
service	EVENING	Service personnel
manufact	SUNRISE	Machine manufacturer

1.2 System booting

Sequence

To ensure unproblematic booting of the NCU, the CF card must be inserted.

When the NCU is booting up, visual information on the current operating system is provided using the following displays:

- The RDY-LED flashes slowly yellow when the CF card is accessed.
- During booting, the 7-segment display outputs different codes that indicate, for example, when the BIOS is started, when the CF card is accessed, etc.

When the booting has been completed successfully, the following is displayed:

- The PLC LED lights up green.
- The 7-segment display shows "6." with a flashing dot.
- The RDY-LED and all other LEDs are not illuminated.

Performing a reset operation

The reset button is located behind the blanking plate of the NCU.

A reset operation resets the entire system and requires a system restart. This is comparable to a "Power On reset" except that the 24 V power supply does not have to be switched off.

Booting for servicing purposes

For service or diagnosis purposes, the NCU can be booted from a service system, the Emergency Boot System.

See also

How do you create a service system for the NCU? (Page 11)

1.3 Displays during system booting

States of the RDY LED

Of the LEDs on the front of the NCU, only the RDY LED and its status is important when booting up the NCU.

BIOS power-up

RDY LED:	Yellow
Other LEDs:	All yellow, set by PLC/option module
Meaning:	No boot device was found: Code 1F or Code FF.
Cause:	The CF card is defective or not bootable, or it does not contain any system software.

Downloading of operating system

RDY LED:	Slowly flashing red (0.5Hz)
Other LEDs:	Set by PLC/option module
Meaning:	Loading the operating system involves three phases, which are displayed on the 7-segment display.

Booting up the kernel

RDY LED:	Slowly flashing yellow (0.5Hz)
Other LEDs:	Set by PLC/option module
7-segment display:	1
Meaning:	Phase 2: Driver initialization

Booting up the basic system

RDY LED:	Slowly flashing yellow/green (0.5Hz)
Other LEDs:	Set by PLC/option module
Meaning:	Phase 3: Initialization of the basic system

NRK/NCK outputs

RDY LED:	OFF (if fault status: red)
Other LEDs:	Set by PLC/option module
Meaning:	After the basic system, the NRK/NCK takes over the LED and 7-segment display.

System error

RDY LED:	Rapidly flashing red (2Hz)
Other LEDs:	Set by PLC/option module
Meaning:	An error has occurred. The system is stopped.

RDY LED:	Rapidly flashing red/yellow (2Hz)
Other LEDs:	Set by PLC/option module
Meaning:	An error has occurred. The system has continued running - although with restricted functions.

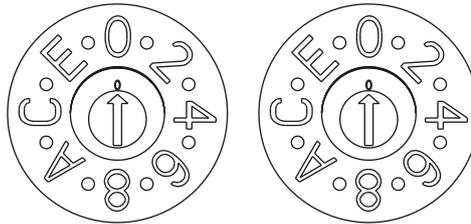
1.4 Meaning of switch positions

Overview

The NCU has two twist buttons in the lower section of the front panel.

- NCK start-up switch with label SIM/NCK
- PLC mode selector switch with label PLC

The switch positions are marked with even numbers or letters; the uneven numbers are represented by dots due to space limitations.



SIM/NCK

PLC

Figure 1-1 Startup and mode selector switch

SIM/NCK twist button

The switch positions of the SIM/NCK switch have the following meaning:

Switch position	Operating mode of the NCK
0	Normal boot-up NCK
1	NCK boot-up with default values (= memory reset)
2	The NCK (and PLC) starts up with the data that was saved at the last shutdown.
7	Debug mode (NCK is not started.)
8	IP address of the NCU is displayed on the seven-segment display.
All others	Not relevant

PLC twist button

The switch positions of the PLC switch have the same meaning as in a SIMATIC S7-CPU:

Switch position	Operating mode of the PLC
0	RUN
1	RUN (protected mode)
2	STOP
3	Memory reset (MRES)
All others	Not relevant

1.5 Ethernet interfaces of the NCU

Supplementary conditions

For the operation of an NCU:

- No more than one NCU may be operated as a DHCP server on the system network.
- An additional external keyboard is required for uppercase/lowercase letters.

Configuration of the interfaces

The following connections can be established via the Ethernet interfaces:

Interface	Labeling	Internal name	Terminal settings
Ethernet (HMI) IE1/OP	X120	(Eth 2)	Connection to the system network with preset IP address 192.168.214.1 with subnet screen form 255.255.255.0 and active DHCP server for SINUMERIK
Ethernet IE2/NET	X130	(Eth 1)	Connection to company network as standard DHCP client
Ethernet (PLC)	X127	(Ibn 0)	Service terminal with fixed IP address 192.168.215.1 and fixed subnet screen form 255.255.255.224 with active DHCP server

Network interface

The network interface is an interface that enables network communication. These are the Ethernet interfaces on the NCU.

VNC (Virtual Network Computing)

Virtual Network Computing is a software that displays the screen contents of a remote computer, with a running VNC server, on a local computer, with a running VNC viewer, and in return sends keyboard and mouse movements of the local computer to the remote computer.

Reference: Operator Components and Networking Manual

Backing up and Restoring Data

2.1 Creating a service system

2.1.1 Applications

Overview

To back up and restore the CF card data, proceed as follows:

- Create a service system
- Back up onto a service system
- Restore from the service system

As an alternative to backing up the data on a service system:

- Back up onto a network drive
- Restore from the network drive

To call a service shell, depending on the configuration, the following possibilities are available:

- (I) Configuration of NCU with TCU: the service shell is called under Linux.
- (II) Configuration of NCU with PCU 50.3 or programming device (PG):
the service shell can be called under Linux or alternatively also under Windows via WinSCP.

Reference: Operator Components and Networking Manual

2.1.2 How do you create a service system for the NCU?

Purpose

In case servicing is needed, create a portable "Emergency Boot System" (EBS) on a USB memory. Thus you can start the booting of the NCU from the service system in order to carry out various service tasks, such as data backup or updates, in a service shell.

Two partitions are created on the service system:

- a Linux partition that is invisible under Windows.
- an FAT partition for DOS or Windows applications.

The FAT partition can be addressed using the path /data, and can be read and written to under Linux and also from a Windows system.

Scope of delivery

To create a service system on a USB storage medium with 512 MB storage capacity, the following files are included on CD:

- an executable file `installdisk.exe`
- an image file `linuxbase-512M.img` for USB-FlashDrive with 512 MB
- an image file `linuxbase-resize.img` for USB-FlashDrive > 512 MB
- a file with the newest information `siemensd.txt`

Recommendation:

Preferably, the SIMATIC PC USB-FlashDrive with 512 MB storage capacity should be used.

Note

To create the service system, you need administrator rights.

All data already on the USB storage medium will be deleted.

The transfer is optimized for USB 2.0; therefore, the transmission to the USB storage medium takes longer when using USB 1.1 than USB 2.0

Proceed as follows

To create a service system on a 512 MB USB storage medium:

1. Copy the service system onto a local hard disk of your programming device (PG) or PC.
2. Connect a 512MB USB storage medium to the USB interface of the PG/PC.
3. Determine in Windows Explorer which drive letter the USB storage medium was assigned, e.g. H:
4. Open a DOS shell and change to the directory in which the files for the service system are stored.
5. In the DOS shell, enter the following command:

```
installdisk --verbose --blocksize 1m linuxbase-512M.img h:
```

Result:

The image is transferred to the USB storage medium; a partition for Linux and a FAT partition for Windows systems are created.

6. Disconnect the USB storage medium and connect it again.

Result:

After this has been completed successfully, you will have a bootable service system on the USB storage medium.

NOTICE

USB storage medium > 512 MB:

If you use a USB storage medium with a storage capacity > 512 MB as service system, there is a further variant, "linuxbase-resize.img", so that the storage capacity of the USB storage medium is retained.

To create a service system on a USB storage medium > 512 MB:

1. Copy the service system onto a local hard disk of your PG/PC.
2. Connect a 512MB USB storage medium to the USB interface of the PG/PC.
3. Determine in Windows Explorer which drive letter the USB storage medium was assigned, e.g. H:
4. Open a DOS shell and change to the directory in which the files for the service system are stored.
5. In the DOS shell, enter the following command:

```
installdisk --verbose --blocksize 1m linuxbase-resize.img h:
```

Result: The image is transferred to the USB storage medium.

6. Connect the USB storage medium to a bootable NCU and boot the NCU from the USB storage medium: Only then can the USB storage medium be used as service system and the entire storage capacity is available.

2.2 Data backup on service system

2.2.1 This is how you save data on a service system

Proceed as follows

To back up the complete system:

1. Connect the service system to a USB interface (X125 or X135) of the NCU and press the reset button.

Alternatively, you can switch the NCU off, connect the service system, and switch the NCU on again.

Result: The NCU boots from the service system.

2. Log on as a service technician using the user name "manufact" and password "SUNRISE".
3. Using the command "sc backup" you can create the backup file "backup01.tgz".

The directory /data on the service system is provided for backup files. Choose between – full to save all data on the CF card, or –user if you only want to save user data.

Example: `sc backup -full /data/backup01.tgz`

Result:

A backup file of the complete CF card is created under /data on the service system on the USB storage medium.

2.2.2 This is how you restore data from the service system

Proceed as follows

To restore the complete system:

1. Connect the service system to a USB interface (X125 or X135) of the NCU and press the reset button.

Alternatively, you can switch the NCU off, connect the service system, and switch the NCU on again.

Result:

The NCU boots from the service system and the main menu is displayed.

2. Select <F2> (softkey or button on an external keyboard) to open a service shell.
3. Log on as a service technician using the user name "manufact" and password "SUNRISE".
4. With the command "sc restore" you can write the backup file "backup01" from the service system back to the CF card in the NCU.

Example: `sc restore /data/backup01.tgz`

Result:

The system state stored in the file "backup01" is restored on the NCU.

Note

If access to the system data on the CF card is not possible because the CF card is defective or empty, you can only log in as user "admin" with the password "SUNRISE" and no longer as the user "manufact".

2.3 Data backup on network drive

2.3.1 This is how you save data on a network drive

Sequence

Proceed as follows:

- Establish a connection to a network drive
- Define a MOUNTPOINT
- Create a backup file

Scenario 1: Start Command Shell under Linux

1. Switch to the VNC Starter using the key combination <Recall+MENU SELECT> (area switchover key) or with <F9+F10>:

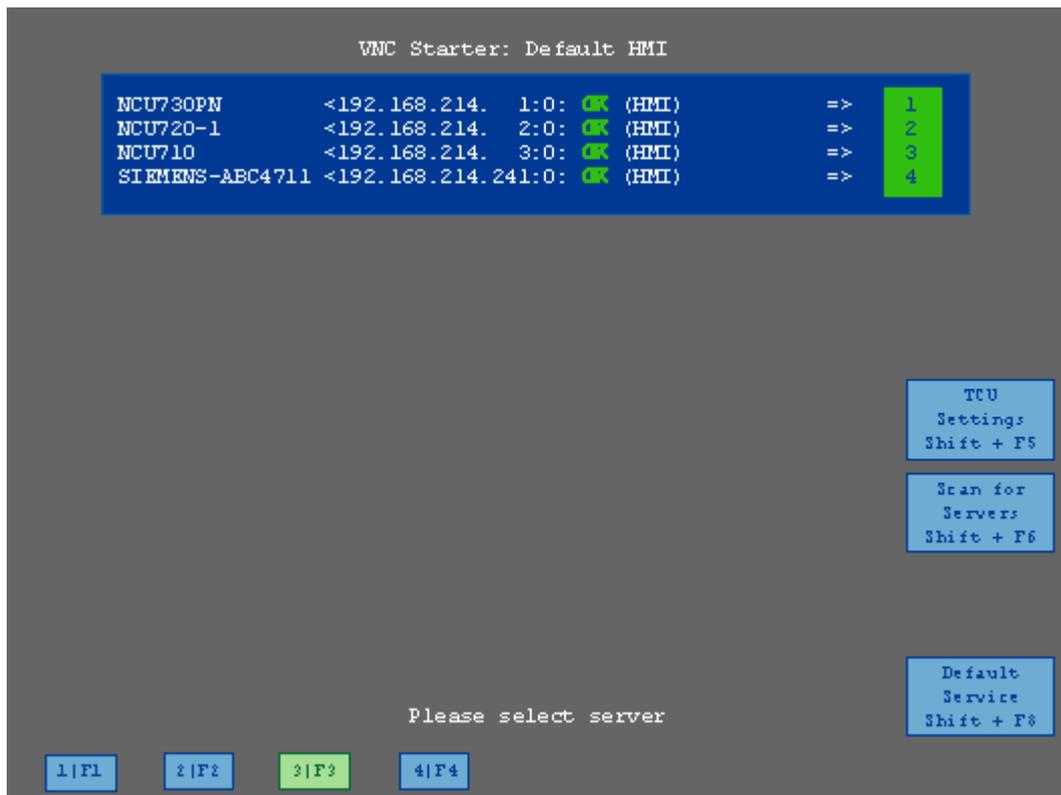


Figure 2-1 VNC connections

- If only VNC connections to the HMI are displayed, press the "Scan for servers" softkey or <Shift+F6> to display further connections:

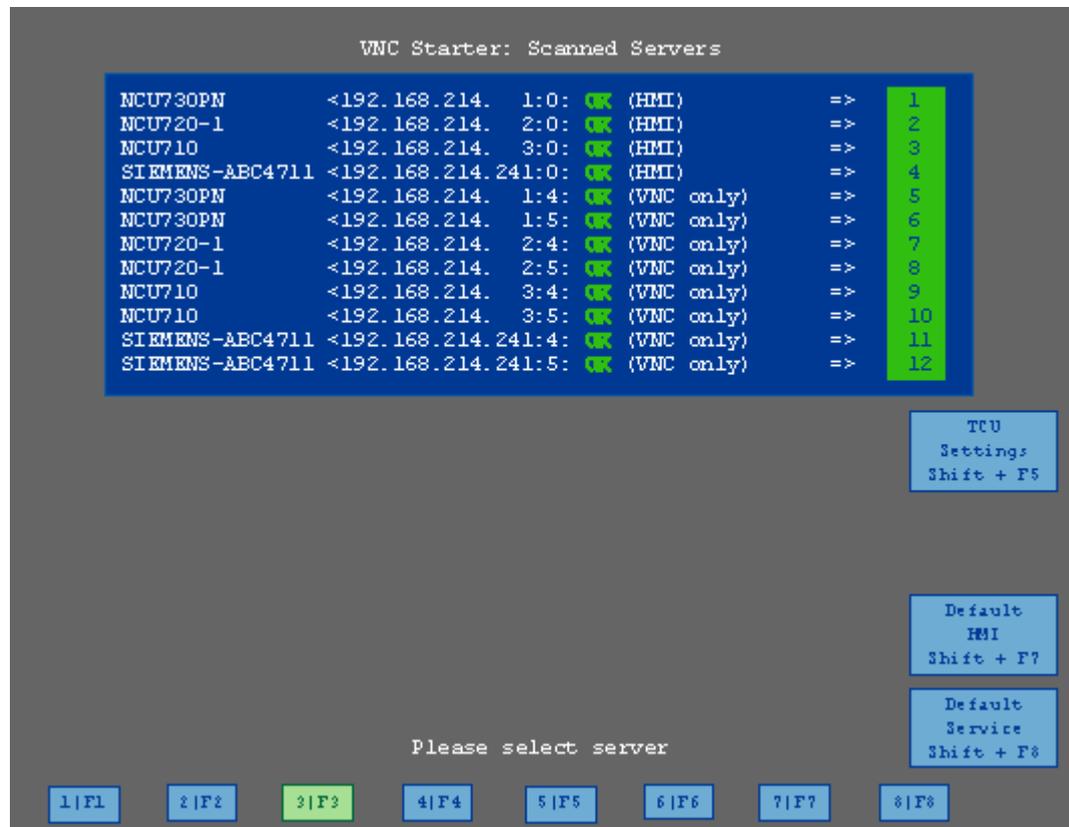


Figure 2-2 Open service shell

- Start a service shell by using the assigned softkey to select "Session 4". In "Session 5", the log console is output.
- Log on as a service technician using the user name "manufact" and password "SUNRISE".
- Create a new "backup" directory under /tmp on the CF card, which you will then use as MOUNTPOINT.

Example: `mkdir /tmp/backup`

- Use the command "sc connect" to connect the network drive:

```
sc connect //username%password@server/share /tmp/backup
```

Please enter here the user name and the password for the network drive that is to be connected to.

- Using the command "sc save", create the backup file "backup01".

Choose between `-full` to save all data on the CF card, or `-user`, if you only want to save user data in the directory /user.

Example: `sc save -full /tmp/backup/backup01`

Result:

A backup file of the complete CF card is created under the specified path on the network drive.

Scenario II: Start the Command Shell with WinSCP on the PG:

1. Start WinSCP and enter the following data in the log-on window:
 - IP address of the NCU (or, if required, host name)
 - User name "manufact" with password "SUNRISE".
2. Select in the menu "Commands" → "Open Terminal".
3. Execute the data backup using the commands described in steps 4 to 6 from scenario I.

See also

Connect (Page 27)

Save (Page 34)

2.3.2 This is how you restore data from the network drive

Sequence

Proceed as follows:

- Stop all subsystems
- Establish a connection to a network drive
- Define a MOUNTPOINT
- Restore the data
- Start all subsystems again

Scenario I: Start Command Shell under Linux

1. Before you can restore backup files, you need to stop the subsystems, e.g. NCK.
2. Switch to the VNC Starter using the key combination <Recall+MENU SELECT> (area switchover key) or <F9+F10>: A list of VNC connections that can be selected is displayed.
3. Start a service shell by using the assigned softkey to select "Session 4". In "Session 5", the log console is output.
4. Log on as a service technician using the user name "manufact" and password "SUNRISE".
`sc stop all`
5. Use the command "sc connect" to connect the network drive:
`sc connect //username%password@server/share /tmp/backup`

6. Please enter here the user name and the password for the network drive that is to be connected to.

To completely restore the system (system data and user data), enter the following:

```
sc restore -full backup01
```

Result: The whole system is overwritten by the backup data.

7. To restore user data only, enter the following command:

```
sc restore -user backup01
```

Result: The user data are written back again.

All subsystems are then restarted:

```
sc start all
```

Result:

The system state stored in the file "backup01" is restored on the NCU.

Scenario II: Start the Command Shell with WinSCP on the PG:

1. Start WinSCP and enter the following data in the log-on window:
 - IP address of the NCU (or, if required, host name)
 - User name "manufact" with password "SUNRISE".
2. Select in the menu "Commands" → "Open Terminal".
3. To restore the data, enter the corresponding commands as described under steps 3 to 5 in scenario I.

See also

Connect (Page 27)

Service Commands

3.1 Using service commands

Overview

The service command 'sc' is a tool used for performing a range of service tasks on a SINUMERIK NCU. The required action is written in the command line after the 'sc', e.g.: sc help

This action produces a list of all actions with a short description. After the action, further parameters or options can follow.

'sc' is available in both the NCU basic system and the service system (mostly in the form of a USB memory.) However, some actions are only useful in one of the two systems (NCU/Service). This is noted for each action.

See also:

The most important terms and abbreviations are explained in the glossary.

Privilege levels

The 'sc' command can execute its actions using more privileges than are normally granted to the calling user. For example, starting or stopping subsystems requires root privileges, but 'sc' allows every user who belongs to the 'service' group to do this.

Each action of 'sc' is assigned a "privilege level". This is a user group to which the user must belong in order to execute the action. As the groups are hierarchically nested, members of "higher" groups can also use the action in question. For example, the group 'manufact' is above 'service', which means that members of the group 'manufact' can call all actions that require the privilege level 'service'.

The privilege level that the caller requires is noted for each individual action. The possible levels are (in ascending order):

- none
- operator
- user
- service
- manufact

Example:

An action with the privilege level 'user' can also always be executed by members of the groups 'service' and 'manufact'. Actions with privilege level 'none' can be called by all users.

If a user does not have the required privileges, the following error message is output:

```
Action 'ACTION' needs at least GROUP privilege level.
```

3.2 Syntax for the Actions

Description

'sc' in the command line is essentially not case-sensitive.

The following entries are therefore interpreted as identical:

sc help show

SC help SHOW

sc HeLp sHoW

In some cases, however, upper/lower case can make a difference, for example in file or user names. This is avoided wherever possible.

The conventions used are as follows:

- Names completely in upper case represent objects to be used depending on the situation.

Example: `sc help ACTION`

In this case, ACTION is to be replaced by the action for which you want a description. If written in lower case, however, the entry should be entered as specified.

- Square brackets indicate optional entries.

Example: `sc help [ACTION]`

In this case the specification of an action is optional, which means that you can enter an action, but do not have to. Square brackets may also be nested:

... `[USERNAME[/DOMAIN]]` ...

In this case, USERNAME and DOMAIN are both optional, but you can only enter a DOMAIN if you have also entered the USERNAME.

- Alternatives are separated with '|'.

Example: `sc start all|system|SUBSYSTEM`

This means that any of the following commands applies:

```
sc start all
sc start system
sc start SUBSYSTEM
```

In the latter case, SUBSYSTEM in upper case can be replaced by a concrete subsystem name.

- As a shortened form, alternatives can also be written in square brackets:
`sc save [-full|-user] ...`
Here you can use the option "-full" or "-user", or none at all.
- Options that begin with '-' can always be entered in any order.
For example, the notation could be interpreted to mean that "-force" must come after "-full" or "-user", but this is not necessarily the case:
`sc save [-full|-user] [-force] FILENAME`

3.3 Generic elements

Overview

This sections describes the syntax elements that are used by several actions.

Permitted interface designations

The names of network interfaces are used by "sc show ip", "sc set ip" and "sc enable DHCPsvr", for example.

As the input of an interface is optional, it is always introduced by a '-' character. The '-' is followed by the actual name. In most cases, multiple names are possible for the same interface.

Accepted names are:

System network port:	"X120", "eth2", "tcu", "internal"
Company network port:	"X130", "eth1", "factory", "extern"
IBN port:	"X127", "ibn0", "pg"

Permitted subsystem designations

Subsystem names are entered when using "sc enable" and "sc start", for example. In most cases, the name of the subsystem is simply the name of the corresponding CFS, without the path and without the extension ".cfs". For example, for the CFS /siemens/sinumerik/nck.cfs, the relevant subsystem name is simply "nck".

It is also possible to use absolute paths (beginning with /) in a subsystem name. In the example above, you could also use "/siemens/sinumerik/nck" as a subsystem name. The difference between names with and without a specified path is that without the path, all CFS with this name are included, but if the path is specified, only this exact CFS is meant.

Subsystem

A subsystem is a CFS that not only contains a collection of files, but also executes a program, for example, at runtime. To do this, the CFS contains a script that is used to control the starting and stopping of this program.

For this reason, only administrators are permitted to set up NFS file systems, and NFS is usually only implemented in uniformly administrated environments. Exported file systems on the server are addressed directly on the server via their path.

CFS (Compressed File System)

A CFS (file extension ".cfs") is a compressed file system, similar to a zip file. It contains files and subdirectories that look like normal files on the controller at runtime. Files and directories contained in a CFS cannot be changed. They are decompressed at runtime as required.

NFS (Network File System)

NFS is the most common protocol for remote file systems in the world of Unix, and is also available for Windows. NFS is closely based on the Unix privilege model – each time a file is accessed, a UID and GID are supplied which the server then uses to decide whether the operation is permitted. The server relies on the client to provide the correct IDs.

Remote File System

A file system that is contacted over the network. The files are physically located on another computer in the network (the "server"), but appear locally the same as all other files. Operations performed on these files are sent via the network to the server, instead of being executed directly on a local storage medium (such as a hard drive or CF card).

As a server usually exports more than one file system, a name for the required file system must also be entered in addition to the name of the server.

SMB (Server Message Block)

SMB is the underlying protocol of MS Windows file systems (also known as drives, releases, shares, etc.). SMB connections are always active in the context of a specific user, who must be known to the server. Exported file systems have a name (release name), by which they can be addressed. The client does not need to know the concrete path on the server.

3.4 Description of the actions

3.4.1 Help

Description

Syntax: `sc help [Action]`
Alternative names: `-h, --help`
Privilege level: `none`

The call of "sc help" without any additional action outputs a list of possible actions with a short description. If you enter an additional action, you receive a more detailed description for this action.

Examples:

```
sc help
All actions:
help [ACTION]
Print help about a specific or list all actions
restart
Reboot the machine
enable hmi|nck|SUBSYSTEM...
enable DHCPSvr -INTERFACE
Enable HMI, NCK, or any other subsystem
[...]

sc help enable
enable hmi|nck|SUBSYSTEM...
DHCPSvr -INTERFACE
```

Enable subsystem(s), like 'hmi', 'nck', and so on. A subsystem name is the name of the CFS containing it, without the '.cfs' extension. This enables all CFSs with that name, but you can also use a full path (e.g. /siemens/sinumerik/nck) to enable just a specific CFS. Another form is to enable the DHCP server on a network interface, for example 'enable DHCPSvr -X120'.

3.4.2 Check-cf

Description

Syntax: sc check-df
Alternative names: checkcf
Privilege level: user

With this action, the CF card is checked reading to see whether it contains defective sectors. If errors occur, this is noted in the file /var/log/messages.

3.4.3 Clear

Description

Various actions can be performed with the "clear" command; only the "clear dhcp" command is relevant here.

clear dhcp

Syntax: sc clear dhcp [-INTERFACE]
Alternative names: ---
Privilege level: service

This command clears any state of the DHCP server at the specified interface (default setting is the system network) and resets it to its initial state. This means that the Lease data is deleted: all IP addresses are re-assigned in the network and the server forgets having ever seen a master server.

This action is only appropriate on a machine on which the active DHCP server runs.

Note

The clearing of the Lease data does not delete the entire file, but only the data contained therein. This action also increments the version number, so that available standby DHCP servers can also perform the deletion.

3.4.4 Closeport

Description

Syntax:	sc closeport ID
Alternative names:	---
Privilege level:	service

Mode of operation

This command closes a port in the firewall opened previously with the "sc openport" command. This is only necessary when the port is to be closed manually before the time set with "sc openport" expires. Otherwise the port is closed automatically when the port service life expires.

ON parameter is the ID number of the firewall rule output by "sc openport".

3.4.5 Connect

Description

Syntax:	sc connect [-ro] SERVER:/PATH [MOUNTPOINT] sc connect [-ro] [-public] //[USERNAME[/DOMAIN] [%PASSWORD]@]SERVER/SHARE [MOUNTPOINT]
Alternative names:	mount
Privilege level:	none

This action makes a remote file system on a server available on the controller. This is enabled by linking the remote file system to a local directory, known as the "MOUNTPOINT". The files offered by the server are then visible under this directory.

NOTICE

Note that when entering this command, the password appears on the screen in plain text according to the specified syntax.

For path names, use the slash "/" and not the backslash "\".
--

Supported file systems

Two types of remote file system are supported: Windows SMB and Unix NFS. These two systems have completely different characteristics, particularly in terms of user administration:

- In Windows SMB, you connect to the server as a particular user that the server must recognize. Via this connection, you then access the files as this user, independently of which local user triggers the action.

This feature means that in SMB systems, you already have to enter a user name, if necessary its domain, and a password at the time of connection.

- In NFS servers, the connection itself does not require a particular user to be entered. Instead, for each file operation, the user who wants to carry out the operation must log on to the server. The server then decides whether or not to permit this. Users are entered using a user ID and group ID, not with names. The server must therefore recognize the corresponding IDs (or permit access for all users.)

Another type of remote file system that is supported are USB memory devices exported from TCUs (USB Flash Drive). Since these are integrated using NFS, the entries for server and path are similar to those for NFS. However, the TCU names are administrated differently, and the USB memory devices have specific paths that do not physically exist.

Notation of the remote file system

For SMB and NFS/TCU, the file system is entered using different notations:

SMB: //[USERNAME[/DOMAIN][%PASSWORD]@]SERVER/SHARE

The fixed share is: //SERVER/SHARE

The server name can of course also be a numeric IP address. SHARE is the name of the release on the server. Note that the character '\$', which often occurs in this type of name, must be preceded by a backslash ('\') in the command line. Otherwise, the system tries to expand a variable.

A user name can also be entered in front of the server name, separated with a '@' character. If necessary, the user name can also be extended by adding '/' followed by the Windows domain to which it belongs. The password belonging to this user is normally queried interactively, so that it is not visible on the screen.

For some applications, however, it may be necessary to write the password on the command line. (For example, programs started from WinSCP cannot read from the keyboard.) In this case, you can append an additional '%' character, followed by the password. If this contains any special characters that are interpreted by the shell (<, >, &, ;, ", ', \$, (,), |), you should shield these by preceding them with a backslash. Commas in SMB passwords cannot be interpreted.

NFS: SERVER:/PATH

In NFS, entering the user is not required, which just leaves the two components SERVER and PATH. As before, SERVER is the name of the file server. In contrast to SMB, PATH is a path name that exists on the server, and not an arbitrarily assigned name.

The command "sc show drives SERVER" shows the file systems offered by a particular server in the correct notation. For SMB, if required, the user name etc. still need to be added.

3.4 Description of the actions

The priorities have the following effect for the synchronization of the DHCP server:

- **MASTER:** The computer node is defined as master, i.e. the computer becomes the active DHCP server. If several masters have been configured in the system network, this computer has the highest priority.
- **HIGH:** The computer node belongs to the server candidates with high priority, i.e. if no server with master priority becomes active, then a computer with "HIGH" priority can be the active server.
- **LOW:** The computer node belongs to the server candidates with low priority, i.e. if no server with master priority or "HIGH" priority becomes active, then a computer with "LOW" priority can be the active server.

Note

Recommended settings are:

- DHCP operation and DHCP synchronization are switched on in the system network.
 - **Exactly one** NCU is set as DHCP master.
 - **Maximum of two** computers are candidates with "HIGH" priority.
 - All other components are set as DHCP clients or candidates with "LOW" priority.
-

See also:

Parameter "SyncModeDHCPD_SysNet" in the "basesys.ini" file.

3.4.10 Openport

Description

Syntax:	sc openport [-MINUTES] PROTO/PORT SOURCE ...
Alternative names:	---
Privilege level:	service

Mode of operation

This command opens a port in the firewall to the company network (X130) for a certain time. The default time is 15 minutes, but this can be changed with the -MINUTES option. The maximum possible time is 60 minutes.

The port to be opened is specified in the form "PROTO/PORTNR". The protocol can be either "tcp" or "udp". This is followed by the specification of the hosts from which the port should be accessible. Several forms are possible here:

- A single IP address: "128.128.12.12"
- A host name (if this can be resolved via DNS), e.g. "server"
- An IP area with network screen form specification, e.g. "128.128.12.0/255.255.255.0"
- An IP area with specification of the valid bits, e.g. "128.128.12.0/24"

If the specification of the source host is completely missing, this is normally acknowledged with an error message. However, an exception is when the "sc openport" command is entered in a shell opened via SSH. The permitted host is taken from the environment variable \$SSH_CLIENT that contains the IP of the SSH client.

If the opening was successful, an ID number is output in a status message:

```
sc: Port tcp/25 is open, rule ID is 6620
```

This ID can be used with "sc closeport" to manually close the port earlier.

See also:

Parameter "FirewallOpenPorts" in the "basesys.ini" file.

3.4.11 Restart

Description

Syntax:	sc restart
Alternative names:	reboot
Privilege level:	service

The action "sc restart" triggers a controlled shut down of the machine (stops all subsystems and the basic system), and then initiates a restart. The effect is the same as the "reboot" command in the basic system, which can only be executed by "root".

3.4.12 Restore

Description

Syntax:	sc restore[-full -addon -addon+ -oem -oem+ -user] [-force] [-nodelete] [-update] [-restart] FILENAME
Alternative names:	---
Privilege level:	user

A backup created using "sc save" can be restored to the controller using "sc restore".

Operating principle

As for "sc save", a restore is only possible from the service system or if subsystems are stopped. If "sc restore" reports an error, for example that the restore will cause running subsystems to crash, you can use the option "-force" to force the operation – just as for "sc save".

3.4 Description of the actions

Normally, "sc restore" deletes the whole destination area before the backup is restored (complete CF card for full backup, /user in user data backups). This means that no files are subsequently available that were not included in the backup.

Options

If no further options are specified, the archive should represent a full backup and this should be restored in full. The status of all files is therefore the same after the "restore" as it was at the time of the backup.

- The -full option additionally forces the partition and the file system to be recreated on the CF card. This is only possible from a service system however. -full is necessary if the partition table and/or file system is missing or damaged.
- However, if you want to restore the backup files without losing any files that have been created in the meantime, you can use the option "-nodelete" to prevent these from being deleted. "-nodelete" is not executed together with "-full", as when the file system is recreated, all files are essentially deleted.
- The options -addon, -oem, -user, -addon+ and -oem+ also allow you to unpack only parts of an archive.
- The -update option is used for loading software updates supplied by Siemens. The -restart option can also be useful with -update. If user-defined system files are changed when loading an archive, a restart or reinitialization is necessary. In such cases, "sc restore" outputs a message to that effect at the end of the operation. The -restart option causes the required action to be performed automatically.

3.4.13 Save

Description

Syntax: `sc save [-full|-addon|-addon+|-oem|-oem+|-user] [-force] [-update] FILENAME`

Alternative names: `backup`

Privilege level: `user`

The call of "sc help" without any additional action outputs a list of possible actions with a short description. If you enter an additional action, you receive a more detailed description for this action.

The action "Save" or "Backup" creates a backup of the CF card in FILENAME. If the action is used from a service system, the backup receives the files of the underlying controller, not of the service system itself.

Options

The options are used for selecting which directories of the file system are to be written to the archive:

- full: complete backup (default): all files of the controller, incl. Boot Loader
- addon: only /addon directory
- oem: only /oem directory
- user: only /user directory (user data)
- addon+: /addon, /oem and /user
- oem+: /oem and /user

If "sc save" is used directly on the controller and the subsystems are running, this may lead to inconsistencies between saved files, because they can still change during the backup process. Therefore, in this case "sc save" normally ends in an error message to inform you that subsystems are still running. If you want to create a backup anyway, you can use the option "-force". "sc save" still issues a warning, but the process continues.

If "sc save" is started from the service system, no subsystems of the controller are running and "-force" is not necessary.

Example:

```
sc save -user /tmp/drv01/backup.tgz
```

3.4.14 Show

Description

Syntax:	sc show ip [-INTERFACE]
Alternative names:	---
Privilege level:	none

In the "sc show" command, various displays are grouped together showing the status of the system.

show ip

Syntax:	sc show ip [-INTERFACE]
Privilege level:	none

This command displays the IP address data of network interfaces. You have the option to enter a specific interface. If no particular interface is specified, the data for all existing interfaces is displayed, as well as the Default Gateway.

Example:

```
sc show ip
X120 (system network, eth0):
  configured: (default)
```

3.4 Description of the actions

```
current : IP=192.168.214.1 Netmask=255.255.255.0
MAC=08:00:06:73:55:fd
  DNS Name   : ncul.local
  Nameserver: 127.0.0.1
  DNS Suffix: local
  DHCP      : synced server, prio=high, active
  Statistics: RX=0.0MB (0.00% errors), TX=0.2MB (0.00% errors)
X130 (company network, eth1):
  configured: DHCP
current : IP=111.222.333.64 Netmask=255.255.248.0
MAC=08:00:06:73:55:fe
  DNS Name   : name.test.siemens.de
  Nameserver: 111.222.333.12 111.222.333.13 111.222.333.14
  DNS Suffix: test.siemens.de
  DHCP      : client (server: 111.222.333.221)
  Statistics: RX=1.2MB (0.00% errors), TX=0.0MB (0.00% errors)
X127 (engineering network, ibn0):
current : IP=192.168.215.1 Netmask=255.255.255.224
MAC=08:00:06:73:55:ff
  DNS Name   : ncu-ibn
  DHCP      : server
  Statistics: RX=0.0MB (0.00% errors), TX=0.0MB (0.00% errors)
Default gateway: 111.222.333.1 (via eth1)
Used nameserver: 127.0.0.1
Used DNS suffix: test.siemens.de local
```

The following data is displayed for each interface:

- **Name:** the name of the connection socket (X1_ _), together with the name used by the operating system in brackets (ethN or ibnN).
- **"configured":** the IP address configured in the basesys.ini (variables ExternalIP/ExternalNetMask for X130, InternalIP/Internal-NetMask for X120), or "(default)" if nothing is configured in the basesys.ini, or "DHCP" if the address was sourced via DHCP.
- **"current":** the currently set IP address together with the network screen form and MAC address of the interface.
- **"DNS Name":** Result of a DNS reverse lookup on the current IP address.
- **"Nameserver":** Here the list of DNS servers is output which are related to this interface (receive e.g. DHCP via this interface).
- **"DNS Suffix":** DNS search suffix related to this interface.
- **"DHCP":** Indication is given here if a DHCP client or server is running for this interface. In the case of a client, the server where the IP address comes from is displayed, too. A DHCP server on X120 can additionally be synchronized on the system network. Then the information is displayed if this is the active server or if it is in standby mode.
- **"Statistics":** Total amount of data received or sent via this interface, and the percentage of faulty packages.

When all interfaces are displayed, the default gateway is also output, i.e. the address of a router to which all packages are sent that cannot reach their destination directly via a local interface.

The default gateway is therefore a piece of data that applies to all interfaces and of which there is only one instance. However, there is one interface via which it must be possible to address the default gateway. This is displayed in brackets after the address.

show drives

Syntax: `sc show drives SERVER`
Privilege level: `none`

"sc show drives" shows the available remote file systems for a particular server. The server name SERVER can be an NFS server, an SMB server or "TCU", which represents any USB media that are connected to a TCU. For details of possible server names and entering a user name (often required for SMB), see the description of the "sc connect" command.

Examples

Notation:

```
sc show drives someuser/somedomain@somepc # Windows-Server
Password: *****
//somepc/C$
//somepc/D$
//somepc/images
sc show drives someserver # NFS-Server
someserver:/export/home1
someserver:/export/home2
sc show drives TCU # TCU USB-Medien
TCU1:/dev0-0
TCU2:/dev0-0
```

All the available remote file systems of the relevant server are listed in the notation that is expected by "sc connect".

- SMB shared drives on Windows servers always begin with "//", followed by the server name and the name of the shared drive. In NFS file systems, the server name is always first, followed by a colon and then the export path.

Connection to SMB servers usually requires the entry of a user name (with domain, if applicable) and a password.

- USB memory devices on TCUs are a special form of NFS, and therefore also have the same notation as NFS file systems. The specified path does not exist physically on the TCU, but is converted there to USB by the NFS server.

3.4.15 Start, Stop

Description

Syntax: `sc start all|system|SUBSYSTEM`
`sc start all|system|SUBSYSTEM`

Alternative names: ---

Privilege level: `service`

These two actions start or stop individual or all subsystems. Since these actions have a direct influence on the runtime behavior, they are only available directly on the PLC, but not in the service system (with the exception of "sc stop system"). The subsystems of the underlying PLC do not run here, and can therefore not be controlled.

Note

Only "all" and "system" function, but not arbitrary subsystems.

Both of these actions have only been implemented to a restricted extent.

Subsystem names

"hmi", "nck", or any other names, can be used for the subsystems. Multiple subsystems can also be specified in a row, which are then started and stopped in this order.

"all" and "system" are special values for the subsystem:

- "all" starts or stops all available subsystems.
- "sc stop system" similarly stops all subsystems, but also the basic system with the PLC.
- "start system" is identical to "start all" and exists mainly for reasons of symmetry.

3.5 Service tools WinSCP and PuTTY

Use

The programs WinSCP and PuTTY are freely-available open source programs for Windows. WinSCP is intended especially for transferring files from and to Linux systems, PuTTY for the remote operation of a command shell.

WinSCP and PuTTY are included with the package 'PCU Basesoftware Thin Client for PCU 50 V07.05.00.00 and higher'. With a PCU 50.3, this package is pre-installed. When installing HMI Advanced on PG/PC, WinSCP is automatically installed, too.

- WinSCP can be downloaded via the following link:

<http://winscp.net/eng/download.php> (Installation Package).

WinSCP also offers a "command shell" that is limited so that commands can be issued, but no callbacks can be answered.

- PuTTY, by contrast, offers a complete command shell.

PuTTY web page: <http://www.chiark.greenend.org.uk/~sgtatham/putty>

With both programs, a service technician can log onto the NCU and carry out service tasks. The username 'manufact' with the password 'SUNRISE' is available for the Siemens service technician.

Starting WinSCP

WinSCP is started from Windows after the service technician has logged onto the NCU with which they are connected with the corresponding privilege (e.g. as user 'manufact' with password 'SUNRISE').

From the "Commands" menu, select "Open terminal" to open a command shell. There you can carry out the service commands in the usual way.

See also

Applications (Page 11)

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Appendix

A.1 Abbreviations

CF	Compact Flash: Memory card
DCK	Direct Control Keys Direct control key
DHCP	Dynamic Host Configuration Protocol: Dynamic assignment of an IP address and other configuration parameters on a computer in a network
DNS	Domain Name System: Conversion of domain names into IP addresses
EBS	Emergency Boot System
EKS	Electronic Key System: System to check the identity of a user (authentication system)
HMI	Human Machine Interface: Operator interface
IRT	Isochronous Realtime (Ethernet)
MAC	Media Access Control: The MAC address is a 48-bit Ethernet ID.
MCP	Machine Control Panel Machine control panel
MPI	Multi-Point Interface Multiple interface
MUI	Multilanguage User Interface
NCK	Numerical Control Kernel: NC kernel with block preparation, travel range, etc.
NCU	Numerical Control Unit: NCK hardware unit
NRT	Non-Realtime (Ethernet)
NTFS	New Technology File System
NTP	Network Time Protocol: Standard for synchronizing clocks in the entire network
NTPD	NTP Daemon: Utility that runs in the background and does not have to be started by the user.
PCU	PC Unit: Computer unit
PG	Programming device
PLC	Programmable Logic Control: PLC
PROFIBUS	Process Field Bus: Standard for the fieldbus communication in automation systems
RAM	Random Access Memory: Program memory which can be read and written into
RDY	Ready Ready
TCU	Thin Client Unit
TFTP	Trivial File Transfer Protocol: Very simple data transmission protocol
UDP	User Datagram Protocol: NTP is mostly processed via UDP.
USB	Universal Serial Bus
UPS	Uninterruptible power supply
UTC	Universal Time, Coordinated Coordinated universal time
VNC	Virtual Network Computing

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Glossary

CFS (Compressed File System)

A CFS (file extension ".cfs") is a compressed file system, similar to a zip file. It contains files and subdirectories that look like normal files on the controller at runtime. Files and directories contained in a CFS cannot be changed. They are decompressed at runtime as required.

Network interface

The network interface is an interface that enables network communication. These are the Ethernet interfaces on the NCU.

NFS (Network File System)

NFS is the most common protocol for remote file systems in the world of Unix, and is also available for Windows. NFS is closely based on the Unix privilege model – each time a file is accessed, a UID and GID are supplied which the server then uses to decide whether the operation is permitted. The server relies on the client to provide the correct IDs.

Remote File System

A file system that is contacted over the network. The files are physically located on another computer in the network (the "server"), but appear locally the same as all other files. Operations performed on these files are sent via the network to the server, instead of being executed directly on a local storage medium (such as a hard drive or CF card).

As a server usually exports more than one file system, a name for the required file system must also be entered in addition to the name of the server.

SMB (Server Message Block)

SMB is the underlying protocol of MS Windows file systems (also known as drives, releases, shares, etc.). SMB connections are always active in the context of a specific user, who must be known to the server. Exported file systems have a name (release name), by which they can be addressed. The client does not need to know the concrete path on the server.

Subsystem

A subsystem is a CFS that not only contains a collection of files, but also executes a program, for example, at runtime. To do this, the CFS contains a script that is used to control the starting and stopping of this program.

For this reason, only administrators are permitted to set up NFS file systems, and NFS is usually only implemented in uniformly administrated environments. Exported file systems on the server are addressed directly on the server via their path.

VNC (Virtual Network Computing)

Virtual Network Computing is a software that displays the screen contents of a remote computer, with a running VNC server, on a local computer, with a running VNC viewer, and in return sends keyboard and mouse movements of the local computer to the remote computer.

Reference: Operator Components and Networking Manual

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A.1 Feedback on the documentation

This document will be continuously improved with regard to its quality and ease of use. Please help us with this task by sending your comments and suggestions for improvement via e-mail or fax to:

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A.2 Overview

