SIEMENS

**SINUMERIK 840D sl
SINUMERIK 840D/840Di/810D**

**Commissioning CNC Part 5
(Basic Software)**

Commissioning Manual

08/2005 Edition

SINUMERIK®-Documentation

Printing history

Brief details of this edition and previous editions are listed below.

The status of each edition is shown by the code in the "Remarks" columns.

Status code in the "Remarks" column:

A .... New documentation.
B .... Unrevised reprint with new Order No.
C .... Revised edition with new status.
        If the technical subject matter shown on the page has changed compared to the previous edition status,
        this is indicated by the changed edition status in the header of the respective page.

Edition	Order No.	Remarks
08/2005	6FC5397-2CP10-0BA0	C

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

Preface

SINUMERIK documentation

The SINUMERIK documentation is subdivided into parts:

- General Documentation
- User Documentation
- Manufacturer/Service documentation

Please contact your local Siemens office for more detailed information about other SINUMERIK 840D sl/840D/840Di/810D publications and publications that apply to all SINUMERIK controls (e.g. universal interface, measuring cycles, etc.).

An overview of publications, which is updated monthly and also 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" → "Overview of Documents".

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

This document is designed for machine tool manufacturers. The manual describes all details the machine tool manufacturer requires to install and start up the SINUMERIK 840D sl / 840D/840Di/810D control systems.

Hotline

If you have any questions on the control, please get in touch with our hotline:
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Standard scope of documentation

This Installation and Start-up Manual describes the functionality of the standard scope. Supplements or modifications through 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 for service cases.

This Installation and Start-Up Manual supports the machine tool manufacturer with the following tasks:
- Configuring the TCU in different network structures
- Starting up the PCU basic software
- Starting up the operating system of the NCU sl

Structure of the Installation and Start-Up Manuals

The Installation and Start-Up Manuals for the SINUMERIK 840D sl are subdivided as follows:
- CNC Part 1: NCK, PLC, Drive
- CNC Part 2: HMI Embedded and HMI Advanced
- CNC Part 3: ShopMill
- CNC Part 4: ShopTurn
- CNC Part 5: Base Software

Steps during start-up

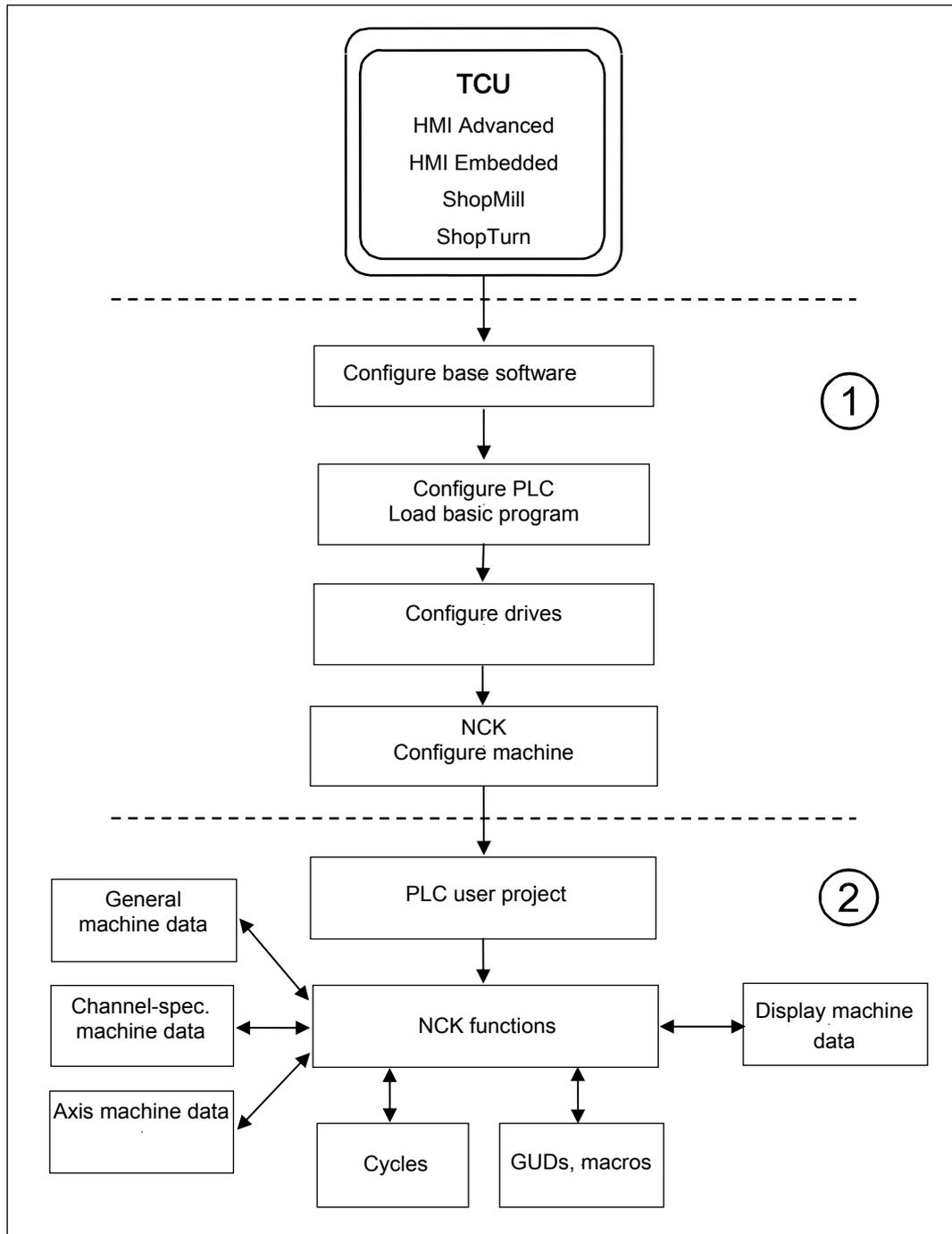The installation steps of the SINUMERIK 840D sl are subdivided as follows:

Step 1 ($\rightarrow$ CNC Part 1, 5):
- Start-up of base software
- Start-up of PLC
- Start-up of drive
- Start-up of NCK

Step 2 ($\rightarrow$ CNC Part 2, 3, 4):
- Start-up of HMI software

Overview of CNC start-up

The following figure gives a schematic overview of the start-up steps that are described in the individual manual sections:

```
                    ┌─────────────────────┐
                    │        TCU          │
                    │    HMI Advanced     │
                    │    HMI Embedded     │
                    │      ShopMill       │
                    │      ShopTurn       │
                    └─────────────────────┘
                              │
    - - - - - - - - - - - - - ▼ - - - - - - - - - - - - - -
                    ┌─────────────────────┐
                    │ Configure base      │        ①
                    │ software            │
                    └─────────────────────┘
                              │
                              ▼
                    ┌─────────────────────┐
                    │ Configure PLC       │
                    │ Load basic program  │
                    └─────────────────────┘
                              │
                              ▼
                    ┌─────────────────────┐
                    │ Configure drives    │
                    └─────────────────────┘
                              │
                              ▼
                    ┌─────────────────────┐
                    │ NCK                 │
                    │ Configure machine   │
                    └─────────────────────┘
                              │
    - - - - - - - - - - - - - ▼ - - - - - - - - - - - - - -
                    ┌─────────────────────┐
                    │ PLC user project    │        ②
                    └─────────────────────┘
    ┌──────────────┐          │
    │ General      │          ▼
    │ machine data │ ◄──► ┌─────────────────────┐        ┌──────────────┐
    └──────────────┘      │                     │        │ Display      │
    ┌──────────────┐      │ NCK functions       │ ◄────► │ machine data │
    │ Channel-spec.│ ◄──► │                     │        └──────────────┘
    │ machine data │      └─────────────────────┘
    └──────────────┘        │              │
    ┌──────────────┐       ▼              ▼
    │ Axis machine │ ◄─► ┌──────────┐  ┌──────────────┐
    │ data         │     │ Cycles   │  │ GUDs, macros │
    └──────────────┘     └──────────┘  └──────────────┘
```

Saftey information

This manual contains information which you should observe in order to ensure your own personal safety, as well to avoid material damage.

Notes relating to your personal safety are highlighted in the manual by means of a warning triangle, no warning triangle appears in conjunction with notes that relate to property damage. The warnings appear in decreasing order of risk as given below.

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

Caution

without a warning triangle means that material damage can occur if the appropriate precautions are not taken.

Notice

indicates that an unwanted result or situation can result if the appropriate advice is not taken into account.

If several risks are present, the warning notice for the highest risk level is always used. If a warning notice with a warning triangle refers to personal injury, this warning can also additionally contain a warning referring to property damage.

Qualified personnel

The device/system described may be installed and operated only in conjunction with this documentation. A device/system may be commissioned and operated by qualified personnel only. Qualified personnel in the sense of the safety-related information of this documentation are persons authorized to start up, earth and mark devices, systems and circuits in accordance with the standards of the safety technology.

Correct usage

Please note the following:

⚠ **Warning**

The unit may be used only for the applications described in the catalog or the technical description, and only in combination with the equipment, components and devices of other manufacturers where recommended or permitted by Siemens. Correct transport, storage, installation and assembly, as well as careful operation and maintenance, are required to ensure that the product operates safely and without faults.

Notes

The following notes with a special meaning are used in the documentation:

Note

This symbol always appears in this documentation where further, explanatory information is provided.

Ordering Data Option

In this documentation you will find the symbol shown on the left with are ference to an ordering data option. The described function is only executable on the control if the control has the designated option.

■

SINUMERIK 840D sl/840D/840Di/810D

Commissioning CNC Part 5 (Basic Software)

Commissioning TCU (IM5)

Valid for

Controller
SINUMERIK 840D sl / 840DE sl
SINUMERIK 840D powerline / 840DE powerline
SINUMERIK 840Di powerline / 840DiE powerline
SINUMERIK 810D powerline / 810DE powerline

Software	*Software version*
PCU-Basesoftware Thin Client	7.5
PCU-Basesoftware Thin Client	8.0

Contents

■

1 Introduction

1

1.1 Description

The Thin Client Unit (TCU) for the distributed configuration permits the spatial
separation of the SINUMERIK operator panel front (OP/TP) and the SINUMERIK
PCU or NCU.

On the SINUMERIK powerline it is also possible to connect one TCU to several
PCUs. All TCUs and PCUs that are connected to one another via a switch form the
TCU network. This is referred to in the following sections as the 'system network'.
The user interface of a PCU is copied to several OPs with one TCU each. In other
words, all of the TCUs display the same screen. Operator actions can only be
performed on one TCU at a time. This TCU then has the operator focus. The PCU
can also have its own OP connected directly to it.

SINUMERIK solution line

The TCU is used here to display the user interface of the PCU 50.3 or the NCU.

SINUMERIK powerline

On the SINUMERIK powerline this permits a configuration where the PCU is
located in the control cabinet and the TCU used for operation is spatially separated.

An **example** of a distributed **configuration** of the **SINUMERIK powerline** with 1
PCU and 4 TCUs is shown in the following diagram:
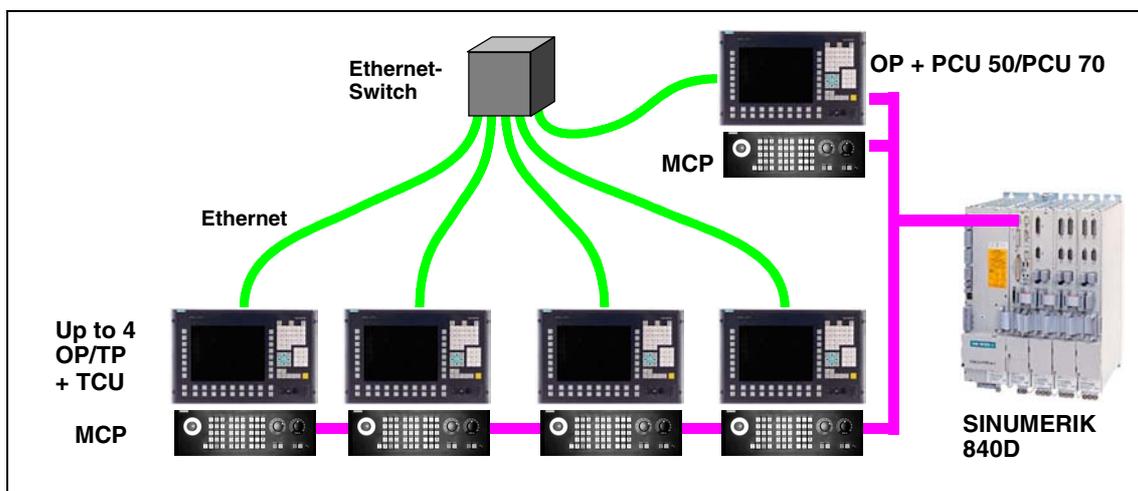
The configuration and cabling of the whole system based on a permissible
configuration is described in:
- "Configuring network operation (SINUMERIK powerline)" and
- "Configuring network operation (SINUMERIK solution line)"

1.2 Requirements for operating the TCU

To operate a TCU on a PCU the following requirements must be met:

- PCU 50 V2 $\geq$ 1.2 GHz with Windows XP and BIOS Version $\geq$ 02.03.09
- PCU basic software $\geq$ 07.05.00.00 on a PCU 50 V2
- If HMI Advanced is used on a PCU 50 V2: Version $\geq$ 06.04.21
- A second Ethernet card if the PCU 50 V2 is also to be used for connecting the TCU to a company network.
- If the PCU is to be operated without an operator panel front, monitors and an additional keyboard will also be required for:
    - Initial installation of the software required for TCU operation (only on PCU 50 V2)
    - Diagnostics when booting the PCU
    - If required, installation of a replacement hard drive (alternatively, the hard drive can also be prepared externally).
- PCU basic software $\geq$ 08.00.00.00 on a PCU 50.3
- If HMI Advanced is used on a PCU 50.3: Version $\geq$ 07.01.00

To operate a TCU on an NCU the following requirements must be met:

- NCU basic software $\geq$ 01.03
- PCU basic software $\geq$ 08.00 on a PCU 50.3 if HMI Advanced is used
- HMI Version $\geq$ 07.01.00
- An additional external keyboard is required for uppercase/lowercase letters.

1.3 Supplementary conditions for operating the TCU

To operate a TCU on a PCU 50 V2/PCU 50.3

The following supplementary conditions apply:
- No more than four TCUs may be active at any one time on a PCU (SINUMERIK powerline).
- All OPs – including any OP that is connected directly to the PCU as well as the OPs connected to the TCUs – must have the same screen resolution.
- If PCU applications requiring the properties of hardware support to implement graphic output (e.g., OpenGL or DirectX) are to be visualized via the TCU, the hardware support for graphic output must be disabled on the PCU.
- The depth-of-color selection is limited to a 16-bit setting.
- If a PC keyboard is connected to the TCU, it cannot be guaranteed that all special keys, e.g., multimedia keys, will be transferred to the software on the PCU.

- You must use PLC block FB9 for automatic switchover of a machine control panel when changing the focus. To do this, FB9 must be parameterized and called accordingly by the PLC user program.

  (see /FB1/ Description of functions Basic machine, Basic PLC program (P3)). The automatic switchover of the machine control panels used when changing the focus can only be performed in conjunction with HMI Advanced on SINUMERIK powerline.

- Machine control panels connected via a PROFIBUS network are not supported for switchover.

- Disabling the switchover between TCUs with HMI Advanced: This function is supported by the PLC program and can only be used on the SINUMERIK powerline and SINUMERIK solution line if HMI Advanced is active (see "Disabling the switchover between TCUs via PLC").

- VetoMode is only available if HMI Advanced is active.

- Peripheral memory media connected to the TCU via USB can only be used with HMI Advanced version $\geq$ 07.01.00 and above.

- CF cards cannot be used on the TCU.

To operate a TCU on an NCU on the SINUMERIK solution line:

The following supplementary conditions apply:

- No more than one TCU may be active on an NCU.

- No more than one NCU may be operated on the system network. See "Configuring network operation (SINUMERIK solution line)" for information on integrating a PCU into the system network.

- When changing the focus, it is not possible to perform a switchover of the machine control panels.

- The OPs on the TCUs, which are operated in parallel on an HMI (on an NCU or on a PCU), must have identical screen diagonals.

- CF cards cannot be used on the TCU.

1.4 Licensing provisions

Licensing and warranty provisions for the "PCU Basic Software Thin Client" software product.

1. Licensing provisions for free software components

The free software listed below can be used with the "PCU Basic Software Thin Client" product:

Name	License	File name
Ultra@VNC	GPL	See gpl.txt
Winpcap	BSD style	See bsd-style.txt
DHCP-Svr Win	GPL	See gpl.txt
Tftp (Win)	BSD	See bsd.txt
Tftp (Linux)	BSD	See bsd.txt
Tsort (Linux)	BSD	See bsd.txt
libz	Zlib license	See zlib.txt
FTP (Win)	GPL	See gpl.txt
Linux-Kernel	GPL	See gpl.txt
Bootloader	GPL	See gpl.txt
libc	LGPL	See lgpl.txt
Busybox	GPL	See gpl.txt
lsh Library liboop	LGPL	See lgpl.txt
lsh library libgmp	LGPL	See lgpl.txt
SSh-Server	GPL	See gpl.txt
DHCP-Client	GPL	See gpl.txt
NTP-Client	BSD style	See bsd-style.txt
svic_lib	LGPL	See lgpl.txt

The licensing texts for the free software used in the "PCU Basic Software Thin Client" product can be found in Appendix A.

These programs have been developed by third parties. If you wish to use free software as well as the program sequence provided by Siemens, please contact the originators or other copyright holders for this software in order to apply for usage rights (in observance of the appropriate licensing conditions).

You can obtain the source text for the free software, along with the associated licensing texts and copyright endorsements, from your SIEMENS sales representative for up to three years after purchasing this product.

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SIEMENS does not offer technical support for this product if you are using it in conjunction with modified software.

■

2

2 Configuring the System

Overview

This chapter describes the procedure for installing the TCU.

Depending on the configuration of your system and the number of TCUs, PCUs, and NCUs, there may be some special aspects of installation. So before you start the installation you should not only read this chapter but also refer to the relevant section in chapter "Configuring network operation" for the SINUMERIK powerline or the SINUMERIK solution line.

Installing the SINUMERIK powerline

Perform the following steps to operate the **TCU on the PCU 50 V2**:

1. Configure the PCUs on the system network

   – Set the IP address of the PCU on the system network
   – Install the "PCU Basic Software Thin Client"
   – Deactivate the DHCP server: If more than one PCU
   – Declare the PCUs

2. Configure the system network

   – Assign names to the TCUs
   – Set the addresses of the machine control panels
   – Connect the programming device to the system network

3. Additional information and further steps:

   – Make changes after installation
   – File structure on the PCU
   – Disable switchover between TCUs via PLC: Only with HMI Advanced
   – In the event of a service call: Connect the programming device

Installing the SINUMERIK solution line

Perform the following steps to operate the **TCU on the PCU 50.3**:

1. PCU on the system network: IP address is preset

    – Change the IP address of the PCU: If more than two PCUs
    – Deactivate the DHCP server: If more than two PCUs or one NCU
    – Declare the PCUs

2. Configure the system network

    – TCU on the system network: IP address is assigned automatically
    – Assign a name to the TCU
    – Connect the programming device to the system network

3. Additional information and further steps:

    – File structure on the PCU
    – Disable switchover between TCUs via PLC: Only with HMI Advanced

Perform the following steps to operate the **TCU on the NCU**:

1. NCU on the system network: IP address is preset

    (declare the PCUs on the NCU if required under the path:
    /user/common/tcu/ftp_tcus/tcux/config)

2. TCU on the system network: IP address is assigned automatically

3. Configure the system network: Assign a name to the TCU

4. In the event of a service call: Connect the programming device

2.1 Factory defaults

Meaning of the symbols:

○   Eth 1 as a DHCP client
●   Eth 2 as a DHCP server
■   Eth 2 with a fixed IP address

2.1.1 Preconfiguration of the TCU

The TCU is configured as a DHCP client and primarily accepts IP addresses from SINUMERIK components, from the DHCP server of such components that is inherent to SINUMERIK, for example NCU on X120 or PCU 50.3 on the system network, or from a default DHCP server. The behavior of the TCU cannot be modified here.
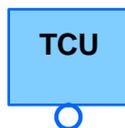
**TCU**   A TCU is a SINUMERIK DHCP client.

                     The TCU has a single Ethernet connection.

A TCU executes a boot via the network. The boot server represents the computer nodes from which the TCU also obtains its IP address.

2.1.2 Preconfiguration of the NCU

On the X120, the NCU is preconfigured for the SINUMERIK DHCP protocol. The NCU is preset here as a SINUMERIK DHCP server.

On X120, the NCU occupies the **fixed IP address 192.168.214.1** with the subnet screen form 255.255.255.0 in its capacity as a DHCP server. The DHCP server of the NCU assigns IP addresses from the range 192.168.214.10 – 192.168.214.240. The behavior of the NCU on X120 cannot be modified. Restricting the available address range that is managed by the DHCP server of the NCU frees up IP addresses 192.168.214.2 – 192.168.214.9 as well as addresses 192.168.214.241 – 192.168.214.254 for network nodes with fixed IP addresses.

NCU
X120   X130
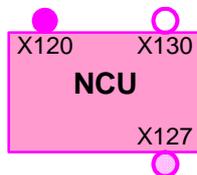
X127

The NCU has three Ethernet connections.

- X120 to connect to the system network with an active DHCP server (IE1/OP)
- X130 to connect to the company network as a default DHCP client (IE2/NET)
- X127 as a service connection with an active DHCP server

On X130, the NCU is set as a default DHCP client for the address reference from a company network. The IP address specified here determines the DHCP server from the company network.

On X127, an NCU is a standard DHCP server (in contrast to the SINUMERIK DHCP server). On X127, the NCU occupies the fixed IP address 192.168.215.1 with the subnet screen form 255.255.225.224.

The range 192.168.215.2 – 192.168.215.9 is reserved and can be used by network stations with a fixed IP address from this range. On X127, IP addresses in the range 192.168.215.10 – 192.168.215.30 are assigned via DHCP, for example to connect a programming device.

Reserved IP addresses on NCU sl and PCU 50.3 (PCU basic software V8.0)

The following defaults apply on delivery:

- Connection to the system network with subnet screen form 255.255.255.0:

| IP address	Network station	Comment
192.168.214.1	NCU on X120	Default
192.168.214.2 – 9	For additional NCUs with a fixed IP address on the system network	Not assigned
192.168.214.10 – 240	For additional TCUs, then for PCUs and NCUs	DHCP clients
192.168.214.241	Fixed IP address of PCU 50.3 on Eth 2	Default
192.168.214.242 – 249	For additional PCUs with a fixed IP address	Not assigned
192.168.214.250 – 254	For PGs with a fixed IP address (service connection)	Not assigned

- Service connection with subnet screen form 255.255.255.224:

IP address	Network station	Comment
192.168.215.1	NCU on X127	Default
192.168.215.2 – 9	For PGs with a fixed IP address	Not assigned
192.168.215.10 – 30	e.g., for programming devices	DHCP clients

2.1.3 Preconfiguration of the PCU

Preconfiguration of the PCU 50.3

A PCU 50.3 has two Ethernet interfaces with default settings suitable for use with the SINUMERIK solution line.
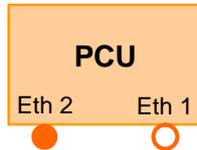
– Eth 2 is preset as a SINUMERIK DHCP server for connection to a system network. Eth 2 is preset to the fixed IP address 192.168.214.241.

– Eth 1 is preset as a default DHCP client for connection to a company network.

A PCU 50.3 is preset for connection to the automation network. The 'PCU Basic Software Thin Client' package is included in the basic installation of the PCU 50.3.

Preparing the PCU 50 V2

A PCU 50 V2 has an integrated Ethernet interface. This is preset as a default DHCP client for the address reference from a company network. A second additional Ethernet card must be installed with an Ethernet interface to connect this PCU to an NCU or a TCU.

The 'PCU Basic Software Thin Client for PCU 50/70 with WinXP V07.05.0.00' software package must be installed on the PCU to operate the PCU 50 V2 in a SINUMERIK solution line group (see "Installing the PCU Basic Software Thin Client").

When installing the 'PCU Basic Software Thin Client' on the PCU 50 V2, the Ethernet interface on the additionally installed Ethernet card must be set according to application (see "Configuring network operation (SINUMERIK powerline)").

Reserved IP addresses up to PCU basic software V7.5

The following default settings apply with subnet screen form 255.255.255.0:

IP address	Network station	Comment
192.168.214.1	PCU 50 V2	Recommended setting on the second additional Ethernet card
192.168.214.2 – 250	For TCUs	
192.168.214.251– 254	For max. 3 PCUs or 1 programming device	For service

2.2 File structure on PCUs and NCUs

Creating the file structure

After allocating the TCU name during the initial boot, the system automatically creates a file structure in the PCU for each TCU. Under normal circumstances, you will not have to change this file structure.

This section discusses the file structure and the information it contains. Subsequent modification of the settings might be necessary, for example, if you want to change the settings when you have completed installation.

Installation path on the NCU

The file structure is created on the NCU under /user/common/tcu.

Installation path on the PCU

The installation path for the file structure on the PCU is E:\TCU\SERVICES.

Here, programs are stored in subdirectory BIN and the configuration files of "PCU Basic Software Thin Client" in subdirectory ETC. The file structure is also created on the PCU in directory F:\TCU\SERVICES (without the configuration files in the ETC subdirectories).

You can make changes to the configuration here, i.e., you can copy the configuration files containing the sections you want to change from drive E:\ to F:\ and make your changes there. We do not recommend making a complete copy of the configuration files.

Note

Use directory E:\TCU\SERVICES "read-only".
Only change the configuration files under path: F:\TCU\SERVICES.

Explanation of the file structure

A file structure is created on the PCU for each TCU under the specified TCU name, for example directory "TCUx".

In directory FTP_TCUS, a file is automatically created with the MAC address of the TCU as its file name to identify each TCU. The sole content of the file is the assigned TCU name, for example "TCUx" .

A file with the name "6" is automatically generated in subdirectory COMMON\TCU\MCPADDR. The name of this file specifies the MPI address of the machine control panel (MCP) assigned to the TCU (OP). In this case, the default address "6". If you want to use another MPI address you must rename the file accordingly.

If it is possible to switch the TCU over to several different PCUs in a system network, enter those PCUs in the config file in subdirectory common\tcu (see "Declaring PCUs").

To manage an OP connected directly to the PCU, directory FTP_TCUS contains a directory called "PCU" with the same file structure as that of the TCUs.

Storage path

The directories and files are located:
→ On the PCU under F:\TCU\SERVICES
→ On the NCU under /user/common/tcu.

File: TCU.INI   (response during focus-change time intervals)
Entry: In file TCU.INI, the response to focus change can be set in the TCUs.

The following setting options are available:

```
[VNCServer]

# VETO MODE
# VetoMode enabled:
# VNC server notifies the HMI regie before another
# panel gets the focus.
# VetoMode disabled:
# Focus timeout mode enabled (implicitly; see FOCUS TIMEOUT)
# (0=DISABLE, 1=ENABLE)
VetoMode=1

# FOCUS TIMEOUT
# Guaranteed time period (in sec) a panel can hold the
# focus at least before another panel can get the focus.
# The time period starts from the moment the panel has
# gained the focus.
FocusTimeout=10

# ALARMBOXTIMEOUT
# specifies the time period (in sec) the messagebox is shown
# (i.e., is operable) in the case of VetoMode=1; no meaning
# else
AlarmBoxTimeOut=5
```

VetoMode = 1
When focus is requested by another OP the user with the focus can prevent the focus from changing by acknowledging an alarm (120011), i.e., the user can keep the operator focus with this veto right. The alarm can be acknowledged during a time interval defined in "AlarmBoxTimeout". If no action is performed during this time, the focus changes to the requesting TCU.

VetoMode = 0
The time interval set in "FocusTimeout" has a disabling effect and will only allow a focus change to take place again when it has expired.

Directory FTP_TCUS

The content of directory FTP_TCUS is generated automatically. You must insert the files marked **bold** if you change the configuration.

TCUx
     common
        tcu
           mcpaddr
             6   (Empty file named with the address of the MCP for this OP (this TCU); default setting is "6", so this file is called "6", which corresponds to the default machine control panel address on the MPI.)
            config   (List of all PCUs and NCUs available on the system network to which this TCU can connect; see "Declaring PCUs".)
        system
     MACADDR ("TCUx")   (file name is the MAC address of the TCUx)

TCU_HWS\ETC\

File:	TCU_HWS.CONF	# IP address of the PCU on the system network
Entry:	interface 192.168.214.1	# IP address of the PCU on the system network
Entry:	pcu_name "main operator panel"	# Identifier of the PCU, as displayed for this PCU in the selection/switching dialog on the TCU. # Max. length: 40 characters; Default: no name (="")

NETKIT-TFTPD\ETC\

File:	NETKIT-TFTPD.CONF	
Entry:	interface 192.168.214.1	# IP address of the PCU on the system network.

BETAFTPD\ETC\

File:	BETAFTPD.CONF	
Entry:	interface 192.168.214.1	# IP address of the PCU on the system network.

UDHCPD\ETC\

File:	UDHCPD.CONF	

Entry:	`start 192.168.214.2`
	`end 192.168.214.250`
		`# Start and end of the IP`
		`address range used by the`
		`DHCP server for the system`
		`network.`

Entry:	`interface 192.168.214.1`	`# IP address of the PCU on`
		`the system network.`
		`# The DHCP server only`
		`assigns IP addresses`
		`requested via this port.`

Entry:	`siaddr 192.168.214.1`	`# IP address of the boot`
		`server for the TCUs and`
		`default VNC server IP`
		`address; usually the same`
		`as the interface.`
		`# The TCUs use this`
		`address as the address of`
		`the boot server, in other`
		`words of the node, from`
		`which they are booted.`

Entry:	`option subnet 255.255.255.0`	`# Subnet screen form for` `the system network.`

2.3 Configuring the IP addresses of network stations

Connecting the NCU on the system network (X120)

On X120, the NCU is preset as required.
No settings are necessary here.

Determining the IP address of the NCU on the company network (X130)

On X130, the NCU is set to the address reference via DHCP. If the company
network has a DHCP server no further settings are required.

There are three ways of determining the address that the NCU obtained on the
company network.

Option 1:

Once HMI Embedded has booted successfully you can call up the current network
configuration on X130:

"Installation" → "HMI" → "Logical drives" → "Network configuration"

This display permits you to change the network settings of the NCU on the company
network (X130).

Option 2:

If the NCU boots in switch position 8, it indicates the IP address on X130 on the 7-segment display.

Option 3:

Once the NCU has booted successfully, open a service shell on the TCU and execute the following command to obtain the desired information:

```
SC SHOW IP
```

Changing the IP address:

If the company network has no available DHCP server or if this cannot be used, you are given the option to set a fixed address for the NCU on X130 (in accordance with the addresses already used on the company network).

Example:

The following command results in an IP address 157.163.245.105 with a subnet screen form 255.255.255.0.

```
SC SET IP 157.163.245.105 255.255.255.0 -X130
```

Further information on the service commands can be found in:
/IM7/ Installing the NCU sl or if you execute the **sc help** command.

2.3.1 Setting the IP address of the PCU in Windows XP

Operator input sequence steps

1. Select the following on the PCU in Windows service mode: "Start" → "Settings" → "Network Connections".

    The "Network Connections" window opens.

2. Double-click the interface you want to parameterize, Eth 2, which is to be used for connecting the TCU or system network (Local Area Connection).

    The "Local Area Connection Properties" window opens.

3. On the "General" tab card, select "Internet Protocol (TCP/IP)" and click the "Properties" button.

The "Internet Protocol (TCP/IP) Properties" window opens.
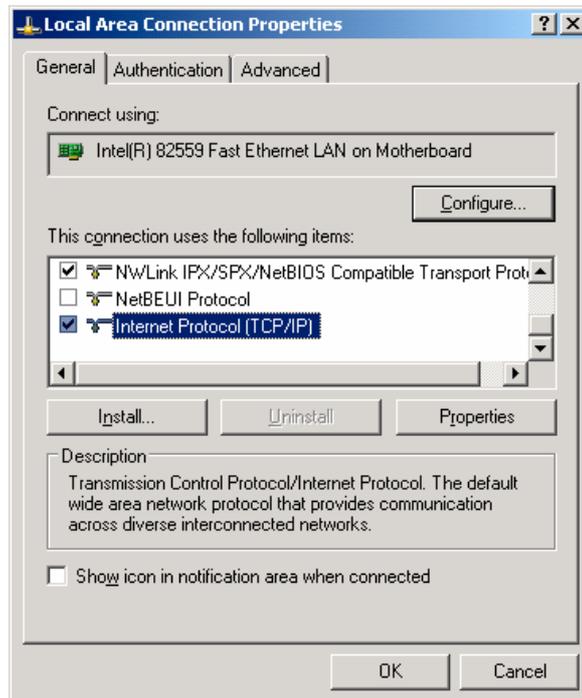
4.   On the "General" tab, select the "Use the following IP address" option and enter
      the IP address and the subnet screen form.

      Recommended setting for the first PCU:
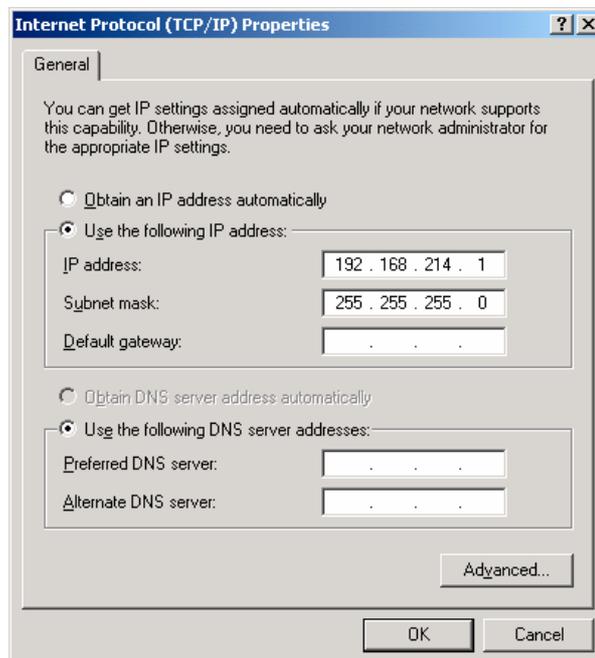
5.   Enter the required new IP address and confirm the settings with "OK".

2.3.2 Deactivating services

Operator input sequence steps

1. Select the following on the PCU in Windows service mode:
    "Start" → "Programs" → "Administrative Tools" → "Services".
    The "Services" window opens.
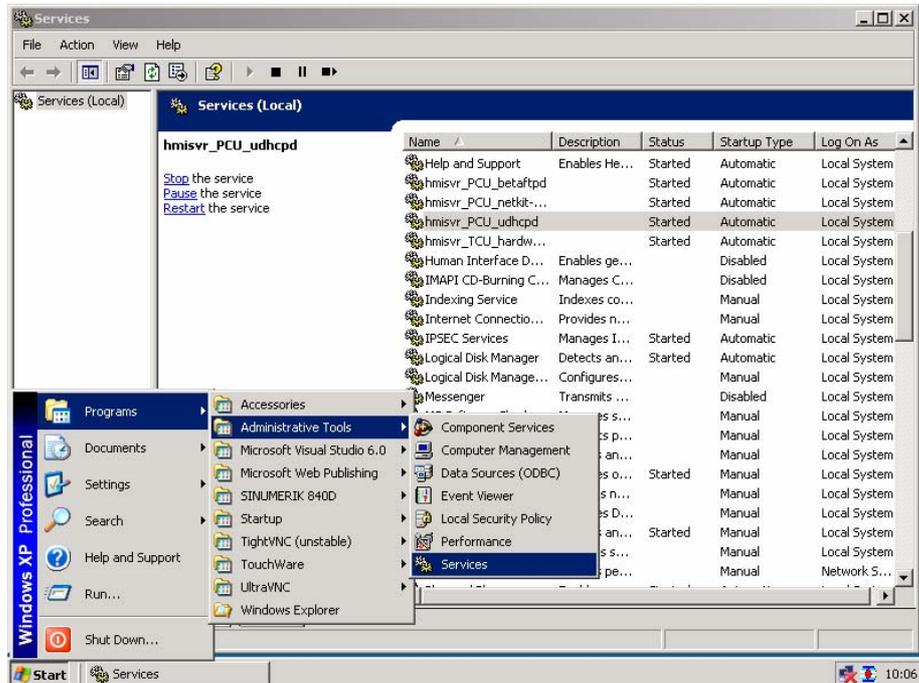
2. Select DHCP server "hmisvr_PCU_udhcp", press the right mouse button, and
    select "Properties".
    The "hmisvr_PCU_udhcp Properties (Local Computer)" window opens:

3.   On tab card "General", select "Disabled" from list box "Startup type" and confirm
     with "OK".

     The DHCP server is deactivated.

4.   In the same way, deactivate the services "hmisvr_PCU_betaftpd" and
     "hmisvr_PCU_netkit-tftpd".

     These two services are no longer required when you deactivate the DHCP
     server.

2.3.3 Declaring the PCUs

Purpose

For communication purposes, TCUs require the following information about the
PCUs available on the network:

- For each TCU (tcux) you **can** specify the PCUs or NCUs with which the TCU
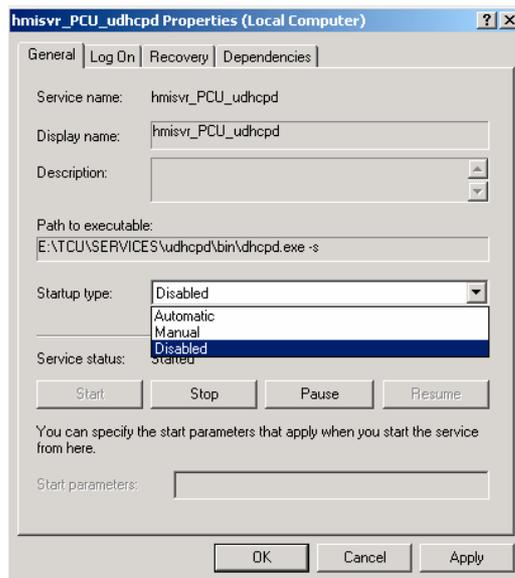 can connect in the relevant configuration file.

  This determines to which PCU a TCU will connect after booting and to which
  other PCUs a TCU can switch.

  This configuring step is only required on the PCU with the active DHCP server.
  On the SINUMERIK solution line this configuring step must be performed on the
  NCU (= always DHCP server).

- You **can** assign a symbolic name for each PCU.

Possible connections for a TCU

For each TCU, enter the PCUs with which the TCU should connect in the
corresponding file F:\TCU\SERVICES\FTP_TCUS\TCUx\common\tcu\config on the
PCU with the active DHCP server.

Observe the following syntax:
VNCServer=IP address:Session number:Password

IP address = IP address of the PCU (or a VNC server)
Session number = 0
Password

Example:

The system network has 3 PCUs with IP addresses 192.168.214.1,
192.168.214.251, and 192.168.214.252.

```
VNCServer=192.168.214.1:0:password
```
IP address for PCU_1: 192.168.214.1

```
VNCServer=192.168.214.251:0:password
```
IP address for PCU_2: 192.168.214.251

```
VNCServer=192.168.214.252:0:password
```
IP address for PCU_3: 192.168.214.252

Notes:

The TCU connects to the first PCU listed in the config file when it boots.

In the case of the "config" file, when switching a TCU between multiple PCUs, it is important to ensure that the file name is written in lowercase letters.

Assigning names to the PCU

On every PCU on the system network, enter a name for the PCU in file
F:\TCU\SERVICES\TCU_HWS\ETC\TCU_HWS.CONF.
Example:

The PCU is to be called "PCU_1".
```
pcu_name "PCU_1"
```

The PCUs are displayed with this name in the selection menu of the "VNC-Starter" window on the TCU as soon as the user presses key combination "Recall" + "Menu select" to switchover the TCU.

If you do not enter a name for the PCU, the IP address of the PCU appears in the "VNC Starter" window instead of the name.

2.3.4 Setting the IP address of the PCU 50.3

Valid for: SINUMERIK solution line

Note

The IP address 192.168.214.241 is set as a factory default for every PCU 50.3 on the system network.

You must only perform the steps described below if you wish to change this default setting.

The PCU IP address must be changed if there are more than 2 PCUs on the network or if the IP address of the NCU has been changed on X120. If changes to the IP address are necessary (in the range 192.168.214.242 – 192.168.214.249) these must be carried out on the PCU **before** it is connected to the system network.

Procedure → See "Setting the IP address of the PCU in Windows XP"

In the case of a PCU that is being used as a DHCP server, the default IP address 192.168.214.241 should be kept.

Deactivating the DHCP server

On a PCU 50.3, the DHCP server should be deactivated in the following cases:

- The PCU 50.3 is operated together with an NCU on the system network:
  The DHCP servers must be deactivated on <u>all</u> PCUs.

- More than one PCU 50.3 is operated on the system network:
  If an NCU is also operated, the DHCP servers must be deactivated on all PCUs.
  If no NCU is present (a rather unrealistic situation), the DHCP servers must be
  deactivated on all PCUs apart from one. The PCU 50.3 with the active DHCP
  server should be that with the IP address 192.168.214.241.

Procedure → See "Deactivating services"

2.3.5 Setting the IP address of the PCU 50 V2

Valid for: SINUMERIK powerline

You must define a fixed network address for each PCU 50 V2 on the system network.

Note

<u>Before</u> you start installation carefully consider what you will require each IP
address for and observe the following:

- Recommended address range in the following table.

- The IP addresses of the PCUs must be different whereas the subnet masks
  must be identical.

- The installation of the 'PCU Basic Software Thin Client' runs automatically if
  you have set the fixed IP address 192.168.214.1 with the subnet screen form
  255.255.255.0 for the PCU 50 V2.

Example:

The system network has 3 PCU 50 V2 that require their IP addresses (for the
second additional Ethernet card) to be set.

Address range for the TCUs: 192.168.214.2 – 250

PCU_1: 192.168.214.1 with subnet screen form 255.255.255.0

PCU_2: 192.168.214.251 with subnet screen form 255.255.255.0

PCU_3: 192.168.214.252 with subnet screen form 255.255.255.0
        (see "Installing the PCU Basic Software Thin Client").

Free IP addresses, e.g., to connect a PG: 192.168.214.253 – 254.

Procedure → See "Setting the IP address of the PCU in Windows XP"

Deactivating the DHCP server

If more than one PCU is operated on the system network, the DHCP server must only be active on a single PCU. Select the PCU with the recommended IP address 192.168.214.1 as appropriate and deactivate the DHCP server on all other PCUs.

You must deactivate the DHCP service after you have installed the "PCU Basic Software Thin Client" and before you next boot the PCU to prevent several DHCP servers running concurrently on the system network.

Procedure → See "Deactivating services"

2.3.6 Installing the 'PCU Basic Software Thin Client'

Valid for: SINUMERIK powerline

The 'PCU Basic Software Thin Client' must be installed on each PCU 50 V2 on the system network.

1. Install the "PCU Basic Software Thin Client" (see /IM6/ Installing PCU Basic Software, "Installing the software").

    Result:
    -   Installation is started.
    -   The installation of the 'PCU Basic Software Thin Client' runs automatically if you have set the fixed IP address 192.168.214.1 with the subnet screen form 255.255.255.0 for the PCU 50 V2.

2. If the PCU has two Ethernet cards and you have <u>not</u> used the recommended setting for <u>either of the Ethernet cards</u>, the "Choose Network Card" window opens.
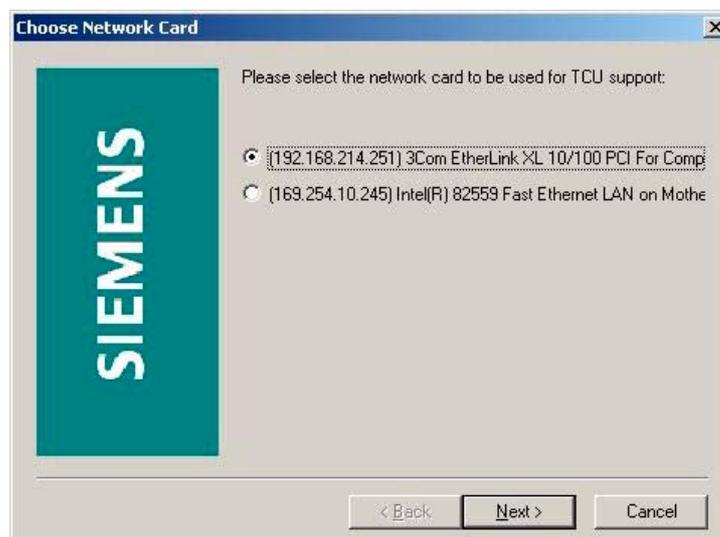
3. Select the Ethernet card for which you have set the fixed IP address for the system network.

The "IP Address" dialog then appears.

The default values of the parameters depend on the previously set IP address of the PCU and have the following meaning:

Parameter	Meaning
Interface	IP address of the PCU on the system network
IP lease block start	Start of the IP address range for the TCUs on the system network
IP lease block end	End of the IP address range for the TCUs on the system network
Subnet screen form	For the system network of the range provided

Notes

- Interface parameter:
  - The IP address of each PCU on the system network must be <u>unique</u>.
  - The IP address of the PCU cannot be changed in this dialog!
  - You can only configure the address range for the system network.

- If you do not make full use of the available IP address range, you will be able to connect a PG with a fixed IP address from this unused address range to the system network if a switch for the system network is used.

- If the system network has more than 2 PCUs, the DHCP server must be deactivated.

2.4 Configuring the TCU on the system network

Assigning names to the TCUs

You must define a name for each TCU on the system network.

Restart the TCU and the PCU with the active DHCP server so that the new settings are applied. The "Unknown/New TCU" window opens on the TCU.

1. Select menu "New".
    The message "Please enter name of this TCU: xxx" appears.

2. If necessary, change the suggested name (xxx) and confirm with the "Input" key on the operator panel.

3. Set the address of the machine control panel (see below).

    Steps 1 to 3 must be performed in sequence for each TCU on the system network.

4. A file structure is created under the specified TCU name (including the MAC address of the TCU) on the PCU.

5. Copy the resulting file structure under F:\TCU\SERVICES to the other PCUs if you have several PCUs connected to your system network.

Connecting a replacement TCU

If a TCU is faulty and has to be replaced, you should proceed as follows:

1. Connect the new TCU.

    The new TCU lists the TCUs on the system network along with their status "active" or "inactive".

2. Select the name previously assigned to the faulty TCU from the "Unknown/New TCU" dialog. As a result, the new TCU is recognized on the network and acquires all of the configuration settings from the TCU that has been replaced.

Setting addresses for TCU machine control panels with an MPI connection

Valid for: SINUMERK powerline

For all TCUs, you must set the addresses of the machine control panels (MCP) allocated to the TCUs (under the relevant TCU on each PCU on the system network).

The directory F:\TCU\SERVICES\FTP_TCUS\TCUx\common\tcu\mcpaddr contains an empty file with the name "**6**"; this corresponds to the default address of the machine control panel for an MPI connection.

Rename file "**6**" in the directory in such a way that the address of the MCP corresponds to the file name (marked **bold** in the following file structure).

```
FTP_TCUS
TCUx
        common
            tcu
                mcpaddr
                    6        (empty file with the address of the MCP for
                             this OP or this TCU as its name.)
                    config
        system
MACADDR ("TCUx")
```

If a PCU or a TCU has no MCP, you must set one of the two following options:

- MCP address = 0 or no entry
  The machine control panel does not switch over after a focus change; the same machine control panel remains active.

- MCP address = 255
  If the operator focus is transferred to this PCU/TCU the previous machine control panel is deactivated and there is no active machine control panel from this point onwards.

2.5 Making changes after installation

If you want to change any settings you have made after completing installation of the TCU, you must make those changes directly in the configuration files (see chapter "File structure on PCU and NCU").

Changing the IP address of the PCU

Example: The fixed IP address of the PCU should be 167.142.117.8 with subnet screen form 255.255.255.0.

File: F:\TCU\SERVICES\TCU_HWS\ETC\TCU_HWS.CONF
Entry: `interface 167.142.117.8`

File: F:\TCU\SERVICES\NETKIT-TFTPD\ETC\NETKIT-TFTPD.CONF
Entry: `interface 167.142.117.8`

File: F:\TCU\SERVICES\BETAFTPD\ETC\BETAFTPD.CONF
Entry: `interface 167.142.117.8`

File: F:\TCU\SERVICES\UDHCPD\ETC\UDHCPD.CONF
Entry: `interface 167.142.117.8`
Entry: `start 167.142.117.9`
Entry: `end 167,142,117,250`
Entry: `siaddr 167.142.117.8`
Entry: `option subnet 255.255.255.0`

The IP address for 'interface' must be the same as the server IP address 'siaddr'!

Changing the address range of TCUs

Example:
The address range for the TCUs should be 167.142.117.9 through 167.142.117.250.

File: F:\TCU\SERVICES\UDHCPD\ETC\UDHCPD.CONF
Entry: `start 167.142.117.9`
Entry: `end 167.142.117.250`

Changing the address of the MCP

See "Setting the address of the MCP"

Changing the name of the TCU

- Delete directory F:\TCU\SERVICES\FTP_TCUS\TCUx from the file structure on every PCU on the system network (see "Assigning names to the TCUs").
- Alternatively: Open file MACADDR and change the name of the TCU in the file. Next adapt the directory name TCUx.

Declaring PCUs subsequently

See "Declaring PCUs"

Removing a TCU from the system network

Delete directory F:\TCU\SERVICES\FTP_TCUS\TCUx and the file with the MAC
address from the file structure on every PCU on the system network.

Removing a PCU from the system network

Delete the entry for the PCU in file
F:\TCU\SERVICES\FTP_TCUS\TCUx\common\tcu\config on the PCU with the active
DHCP server for each TCU.

Booting the PCU on the SINUMERIK desktop ("Headless" operation)

When booting, the PCU waits until it connects to a TCU or an OP. This delay on the
PCU (so-called "Headless" operation) can be set in the file tcu.ini. The system waits
until the maximum possible number of TCUs that docked in the last session have re-
docked before displaying the time window to press key <3>. This timeout is the time
interval, which is set in the default parameter file or in the user-specific parameter file
TCU.INI via "TCUConnectTimeout" (see "File structure on PCU and NCU").

In the case of a "headless PCU", if no TCU has docked after this time, the system
continues to wait until at least one TCU has docked. The timeout here is the time
interval, which is set in the default parameter file or in the user-specific parameter file
TCU.INI via "HeadlessTCUConnectTimeout".

```
[TCU_HWSService]

# TCU CONNECT TIMEOUT
# Guaranteed time period (in sec) the HMI manager waits
# for TCUs recognized as connected TCUs by the TCU_HWS
# service.
TCUConnectTimeout=30

# TCU CONNECT TIMEOUT FOR HEADLESS STARTUP
# Guaranteed time period (in sec) the HMI manager waits
# for TCUs recognized as connected TCUs by the TCU_HWS
# service, if a PCU panel doesn't exist and no TCUs are
# connected till now. This time period is effective ad-
# ditionally to the time period TCUConnectTimeout.
HeadlessTCUConnectTimeout=300
```

Note

The SINUMERIK desktop can also be launched by pressing key <3> within 3
seconds of the version details of the PCU Basic Software appearing in the
background when booting.

2.6 Disabling switchover between TCUs via PLC

When using HMI Advanced, the TCU switchover disable offers the option of dynamically disabling the switchover from one TCU to the next when the system is running by means of the PLC. For the duration of the disable, a user authorization request to change user authorizations between TCUs will be ignored by the system and rejected.

The rejected user authorization request leads to a message being output in the user response line of the HMI, in the form of a checkback signal for the requester. The message disappears after five seconds.

HMI/PLC data interface

The "switchover disable" function is always active in HMI Advanced and does not have to be switched on explicitly. The function is controlled by a data bit DBX in the PLC. The HMI transfers the active OP to the PLC, thus forming the basis of the control function in the PLC.

The control bits and control information for this function are stored in the m:n data interface of the PLC. In terms of m:n, this function can be operated separately for the currently overridden HMIs in both m:n online interfaces (DB19.DBW120 ff for HMI1 and DB19.DBW130 ff for HMI2). If a system is not running an m:n, only the first m:n online interface is used for this function.

Switchover disable is controlled by a TCU_SHIFT_LOCK bit, managed by the user, on each HMI in the PLC. The bit address for the first HMI is DB19.DBB126.6 and DB19.DBB136.6 for the second HMI.

The PLC m:n online interface is expanded so that byte DB19.DBB118 is still added to the first interface and byte DB19.DBB119 to the second. These bytes acquire the index of the active TCU (of the active OP) for the appropriate HMI. The byte is called TCU_INDEX. The appropriate HMI uses the TCU index configured for the active TCU to describe the TCU_INDEX byte (see "Configuring").

The TCU_SHIFT_LOCK bit is monitored by the appropriate HMI. A value = 1 triggers the switchover disable; switchover is enabled if the value returns to 0. The TCU_SHIFT_LOCK bit can be set, for example, to the PLC by the user pressing a key or it can be managed by the PLC user program according to its own logic. The TCU_SHIFT_LOCK bit is managed in the PLC exclusively by the user; the HMI only accesses this bit in read-only mode.

The HMI assigns the configured index of the TCU or PCU whose OP currently possesses user authorization in the shadow grouping to the TCU_INDEX field. If no OP is active, a value of 0 is entered in TCU_INDEX.

If no TCU index is configured for the active TCU (active OP), the value 255 = undefined is presented as the TCU index. This means that the values 0 and 255 may not be configured as the TCU index.

Configuring

The TCU index and machine control panel address are configured on the PCU.
A TCUINDEX directory, containing an empty file named after the index, is created
relative to the TCU directory for each TCU (TCUx) or, in the case of a directly
connected OP, for the PCU itself:

FTP_TCUS
    TCUx
        common
            tcu
                mcpaddr
                    6   (Empty file named after the address of the
                              MCP for this OP (this TCU); default setting is
                              "6", so this file is called "6", which corresponds
                              to the default machine control panel address
                              on the MPI.)
                tcuindex
                    8   (Empty file named after the index to be
                              assigned to this OP (this TCU); there is no
                              default setting, the directory and file must be
                              created manually for the "switchover disable"
                              function.)

The file structure for managing the TCU index is not created automatically, but must
be created for the "switchover disable" function.

Operating principle

If the TCU_SHIFT_LOCK bit is set for switchover disable, a user authorization
request is not carried out independently of the mode set on the HMI for the allocation
of user authorizations (VetoMode), i.e., a change to the user authorization is rejected.

This message appears on all OPs, for approximately 5 seconds:
`"No switchover: Switchover disable set in current PLC"`, while
operations on the OP with the user authorization can still be carried out unaffected.

Note

The switchover disable only relates to changing the user authorization on the
OPs in a shadowing grouping on a PCU.

Active switching from one OP to another PCU is not prevented.

Special features

- Even if switchover disable is set, the TCU_INDEX field value may change in the PLC. This is the case if:

  – The OP in possession of the user authorization is actively switched to another PCU. Depending on whether another TCU takes on the user authorization or no TCU is currently active, either the index of the TCU (as when user authorizations are switched over) or the PCU itself (if its directly connected OP becomes active) is entered.

    This may also be the value 255, if no TCU index is available for the OP. 0 is entered if an OP is no longer available in the shadow grouping.

  – An m:n switchover is in progress. The HMI of the incoming PCU deactivates the HMI, which is active on it. An OP from the shadow grouping of the new (incoming) PCU must receive the user authorization. The TCU index of this OP is entered in the TCU_INDEX field.

  – A PCU is disconnected from a NCK/PLC in the context of m:n. No HMI and, therefore, no OP with operator focus is then available on the exited NCK/PLC. This is signaled independently of a switchover disable by entering the value 0 into the TCU_INDEX field.

- If a TCU is actively switched over to another PCU, it can be deactivated there, i.e., it does not obtain the user authorization, if a switchover disable is set for the destination PCU.

- With an m:n PCU switchover, i.e., the PCU is switched to another NCK and, therefore, to another PLC, the PCU takes on the switchover disable settings of that PLC.

- The m:n interlock options on the PLC side have priority over the TCU switchover disable, so that a set TCU switchover disable cannot prevent an m:n switchover. If necessary, the m:n interference options should be synchronized here with those for the TCU in the PLC. It may, for example, be practical to set or remove the m:n displacement disable simultaneously with the TCU switchover disable.

■

3

3 Configuring Network Operation (SINUMERIK powerline)

Overview

The various configurations for operating a TCU on a PCU are described in this chapter. Included in this description are m:n configurations of control unit management for the SINUMERIK powerline, which can provide the basis for operation with the TCU. The m:n functionality is configured on the PCUs for each relevant HMI in the usual way. No changes result from operation with the TCU.

The individual configurations are designated as follows:

t:(m:n)

t = Number of TCUs on a system network
m = Number of PCUs or active HMIs on them on a system network
n = Number of NCUs

The brackets express how the PCUs are operated on the NCUs. The expression (m:1) means that there are m PCUs each of which is assigned its own NCU. Consequently (m:n) means that m PCUs can be connected via n NCUs according to the rules of control unit management.

The integrated Ethernet interface is used for operation without a company network. An additional integrated Ethernet interface is used with the system network to operate the TCU in the event of connection to a company network.

Colors and symbols:

|	
○	Integrated Ethernet interface of the PCU 50 V2 (DHCP client)
●	Additional Ethernet interface of the PCU 50 V2 (DHCP server)
■	Additional Ethernet interface with a fixed IP address
Green connection	Uncrossed Ethernet cable
Gray connection	Crossed Ethernet cable (crossover)

Only the hardware required to connect the components (cable, switch) is listed under "Hardware requirements".

As it is of no relevance to the configuration options whether an MCP is linked to a TCU with its OP, the MCP is not represented in the figures. Nor is it of any relevance to this description whether a separate OP is connected directly to a PCU or not. Consequently, such a scenario can also be disregarded.

3.1 Configurations without connecting the PCU to a company network

If, besides being connected to the TCU, the PCU is not linked to any other computer network (e.g., company network), the TCU is connected to the integrated Ethernet interface on the PCU.

3.1.1 1:(1:1) without company network
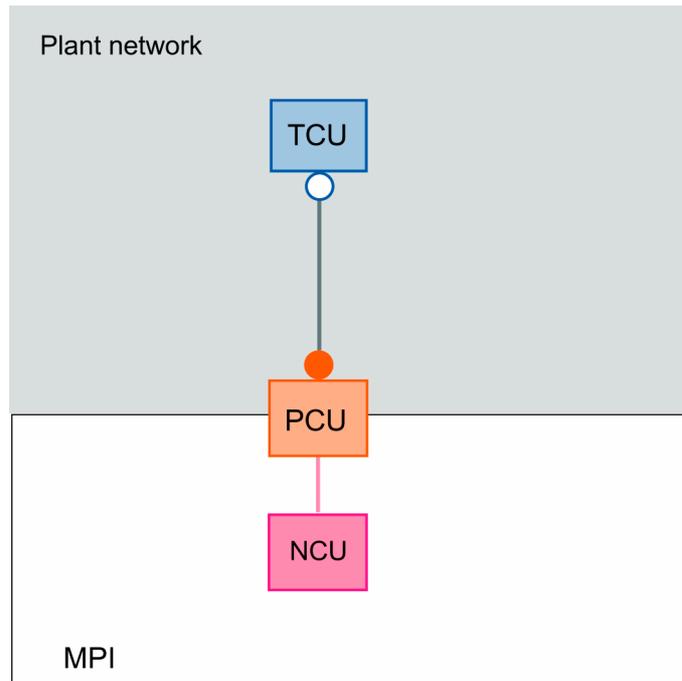
Hardware requirements

Crossed Ethernet cable (crossover) for direct connection of the TCU to the PCU.

Options/restrictions

- Connection of the PCU to a company network not possible
- Not possible to connect a PG to the PCU via Ethernet

3.1.2 1:(1:n) without company network
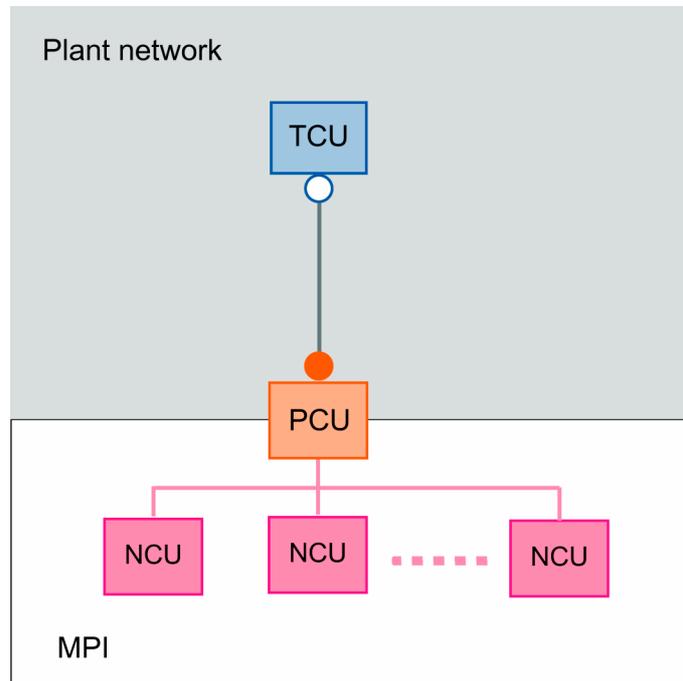

Hardware requirements

Crossed Ethernet cable (crossover) for direct connection of the TCU to the PCU.
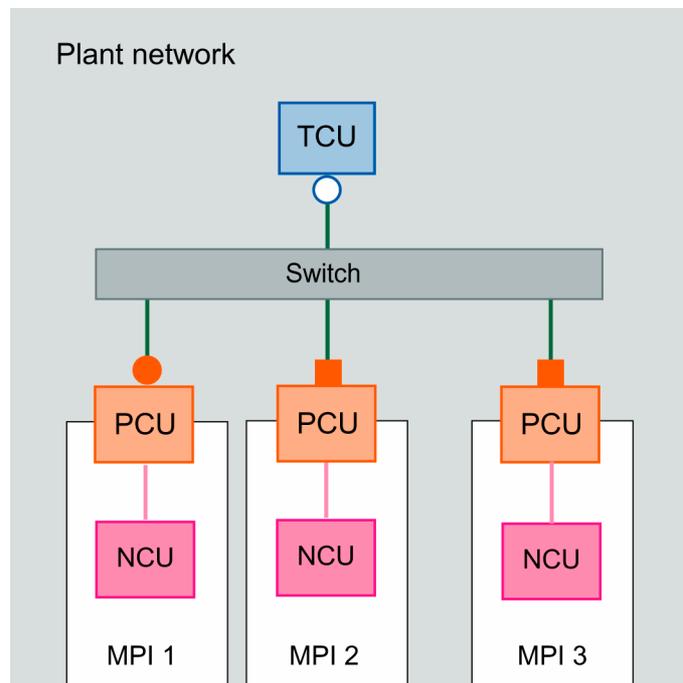
Options/restrictions

- Connection of the PCU to a company network not possible
- Not possible to connect a PG to the PCU via Ethernet
- Only one NCU (to which the PCU is connected) can be operated and visualized at any one time

Installation and startup

Operation of the PCU at n NCUs is conventionally configured in file NETNAMES.INI on the PCU.

3.1.3 1:(m:1) without company network

Hardware requirements

- Standard, uncrossed Ethernet cable for connecting the TCU and PCUs to the system network
- Switch via which the 1 TCU and m PCUs are connected.

Options/restrictions

- Connection of the PCU to a company network not possible
- Possible to connect a PG to the PCU on the system network via Ethernet
- Only one NCU (to which the selected PCU is connected) can be operated and visualized at any one time
- TCU can be switched to the various PCUs
- A DHCP server is only active on a <u>single</u> PCU.
- Possible configurations: See "Setting the address of the MCP"

Setting the address of the MCP

Example:
The PCUs are called PCU_1, PCU_2, and PCU_3. Each PCU is assigned to an MCP. The addresses of the MCPs are 6 through 8. An OP with MCP (address 9) is connected to the TCU (name TCU1).

You must rename the address files in directory F:\ TCU\SERVICES\FTP_TCUS on the PCUs as follows (see **bold** text in the following file structure).

Setting in file structure on PCU_1:
FTP_TCUS
    PCU
        COMMON
            TCU
                MCPADDR
                6
        SYSTEM
    TCU1
        COMMON
            TCU
                MCPADDR
                9
                CONFIG
        SYSTEM
    MACADDR ("TCU1")

Setting in file structure on PCU_2:
FTP_TCUS
    PCU
        COMMON
            TCU
                MCPADDR
                7
        SYSTEM
    TCU1
        COMMON
            TCU
                MCPADDR
                9
        SYSTEM
    MACADDR ("TCU1")

Setting in file structure on PCU_3:
FTP_TCUS
    PCU
        COMMON
            TCU
                MCPADDR
                8
         SYSTEM
    TCU1
        COMMON
            TCU
                MCPADDR
                9
         SYSTEM
    MACADDR ("TCU1")

3.1.4 t:(1:1) without company network
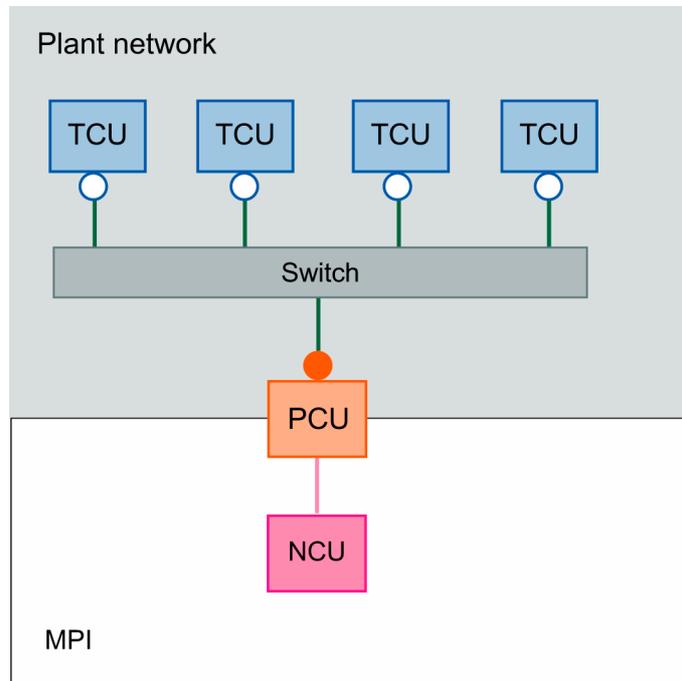
Hardware requirements

- Standard, uncrossed Ethernet cable for connecting the TCUs and PCU to the
  system network
- Switch via which the t TCU and 1 PCU are connected

Options/restrictions

- Connection of the PCU to a company network not possible
- Possible to connect a PG to the PCU on the system network via Ethernet
- All TCUs show the same display

Setting the address of the MCP

Example:
The TCUs are called TCU1 through TCU4. Each TCU is assigned an MCP.
The addresses of the MCPs are 7 through 10. An OP with MCP (address 6) is also
connected to the PCU itself.

You must rename the address files in directory F:\ TCU\SERVICES\FTP_TCUS on the PCU as follows (see **bold** text in the following file structure).

```
FTP_TCUS
    PCU
            COMMON
                    TCU
                            MCPADDR
                            6
            SYSTEM
    TCU1
            COMMON
                    TCU
                            MCPADDR
                            7
            SYSTEM
    TCU2
            COMMON
                    TCU
                            MCPADDR
                            8
            SYSTEM
    TCU3
            COMMON
                    TCU
                            MCPADDR
                            9
            SYSTEM
    TCU4
            COMMON
                    TCU
                            MCPADDR
                            10
            SYSTEM

    MACADDR ("TCU1")
    MACADDR ("TCU2")
    MACADDR ("TCU3")
    MACADDR ("TCU4")
```

## 3.1.5 Connecting the programming device to the system network

Valid for: SINUMERIK powerline

You can connect a programming device via Ethernet to the system network to exchange data with the PCU.
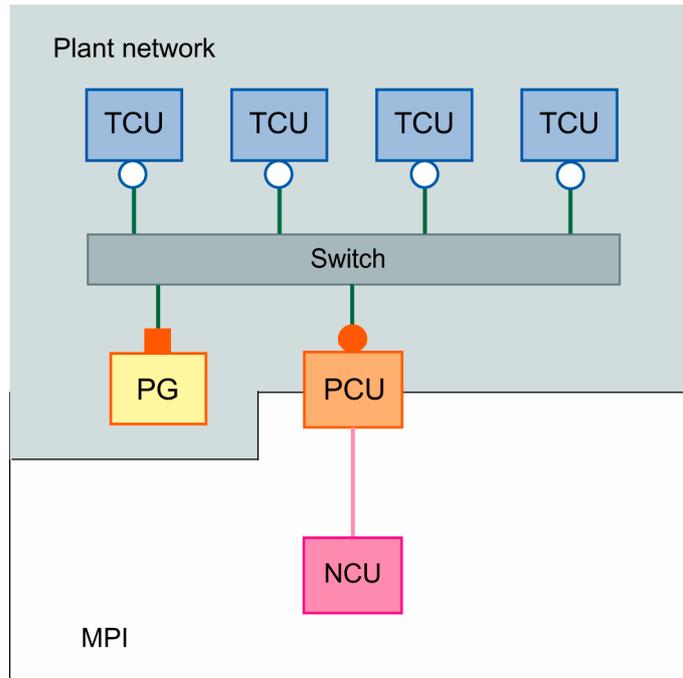
1. Restrict the address range for the TCUs as necessary to ensure that an IP address is free for the programming device.

    → See "Making changes after installation", section "Changing the address range of the TCUs".

2. Set a fixed IP address for the PG with the same subnet screen form as for the PCU on the PG in Windows (Start → Settings → Control Panel → Network Connections).

    → See "Setting the IP address of the PCU in Windows XP"

3.1.6 t:(1:n) without company network
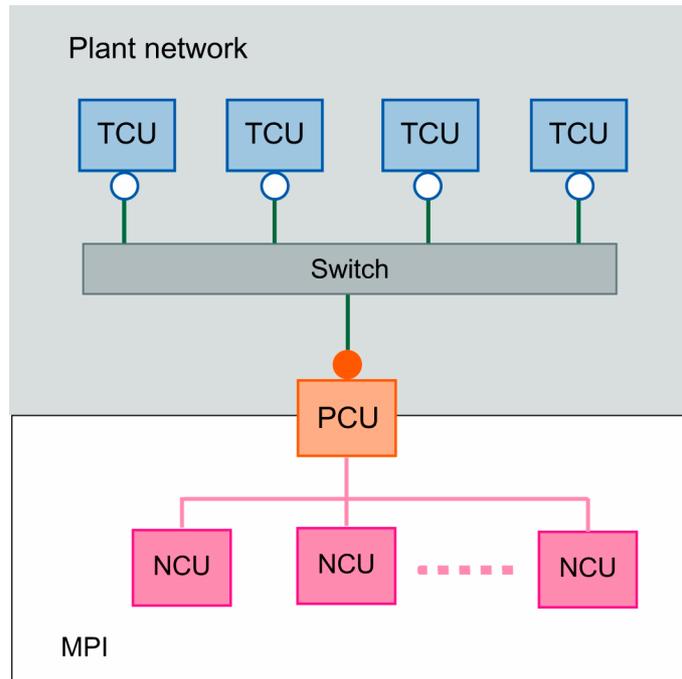
Plant network

| TCU | TCU | TCU | TCU |

Switch

PCU

| NCU | NCU | ..... | NCU |

MPI

Hardware requirements

- Standard, uncrossed Ethernet cable for connecting the TCUs and PCU to the system network
- Switch via which the t TCU and 1 PCU are connected

Options/restrictions

- Connection of the PCU to a company network not possible
- Possible to connect a PG to the PCU on the system network via Ethernet
- All TCUs show the same display
- With m:n operation on the PCU, every NCU can be operated and visualized from every TCU via the PCU

Installation and startup

- Settings for the system network: see "t:(1:1) without company network"
- Operation of the PCU on n NCUs is conventionally configured in file NETNAMES.INI on the PCU.

3.2 Configurations with PCU connected to a company network

If the PCU is to be connected to an additional computer network (company network), a second Ethernet card will be required. This physically separates the company network and the system network. The TCUs can only be operated on the system network by means of the second Ethernet card.

- Integrated Ethernet card on the PCU for the company network
  The IP address of the integrated card is automatically assigned via the DHCP server of the company network. You do not have to make any settings yourself.
- Second Ethernet card on the PCU for the system network
  You must set a fixed IP address for the second Ethernet card (see "Configuring PCU 50 V2 on the system network").

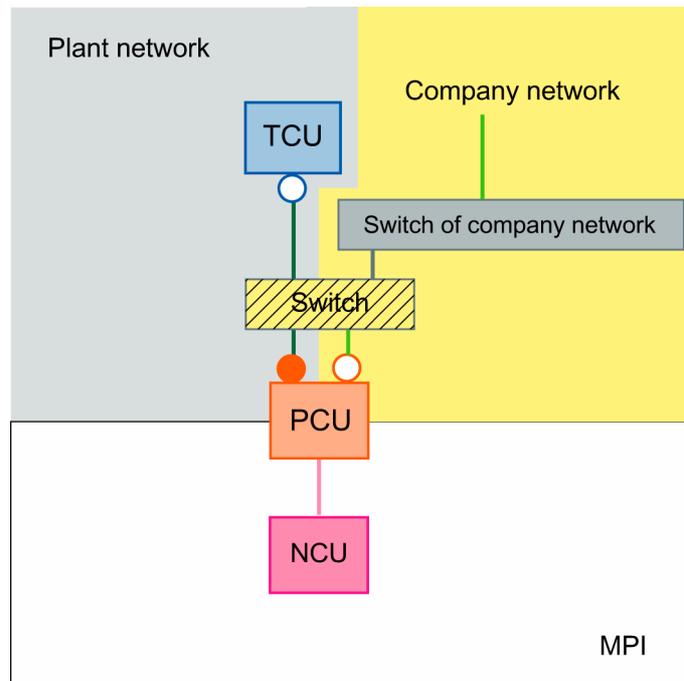### 3.2.1 1:(1:1) with company network
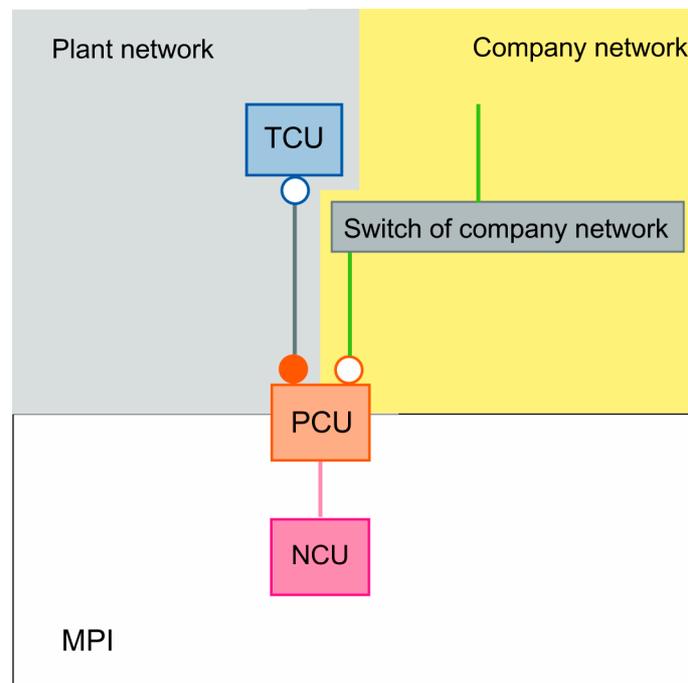
Configuration option 1:

Configuration option 2:

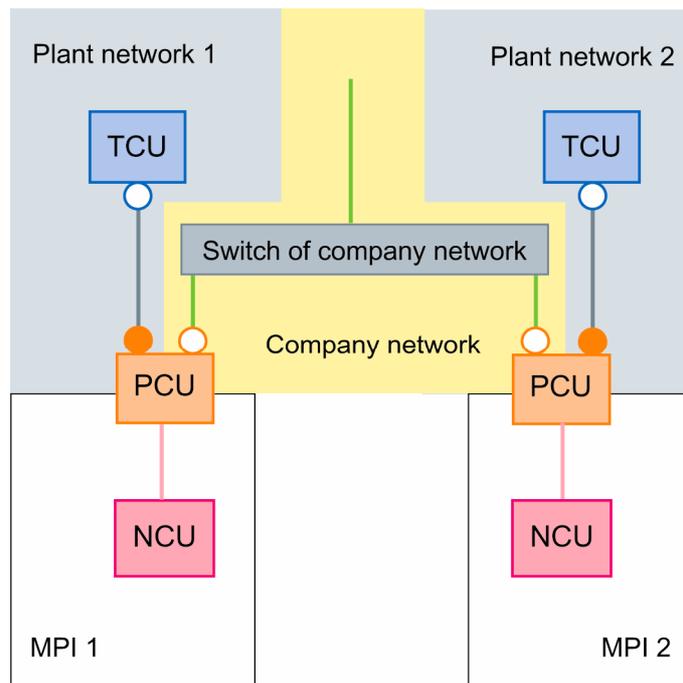Connections of the system network and connections of the company network are routed through a joint switch.
Prerequisite: The address range used for the system network is compatible with the company network. An autonomous sub-network for the system network is set up automatically.

Hardware requirements

- Additional Ethernet card for PCU
- Crossed Ethernet cable (crossover) for direct connection of the TCU to the PCU
- Standard, uncrossed Ethernet cable for connecting the PCU to the company network
- For configuration 2:
  Crossed Ethernet cable (crossover) between switch and company network

Options/restrictions

- Connection of the PCU to a company network possible
- Possible to connect a PG via Ethernet to the PCU on the system network (configuration option 2) or company network (configuration option 1)
- It is possible to extend configuration option 1 by integrating the PCUs of several 1:(1:1) systems into the company network. Each of the 1:(1:1) systems must be configured separately.

It is not possible to extend configuration option 2 by integrating the PCUs of several 1:(1:1) systems into the company network because address conflicts would arise between the system networks.

Installation and startup

If you want to integrate several 1:(1:1) systems (or their PCUs) into the company network you must configure each system separately. Each of the systems can be configured identically.

3.2.2 1:(1:n) with company network

Configuration option 1:

Configuration option 2:

Connections of the system network and connections of the company network are routed through a joint switch.

Prerequisite: The address range used for the system network does not collide with the company network. An autonomous sub-network for the system network is set up automatically.
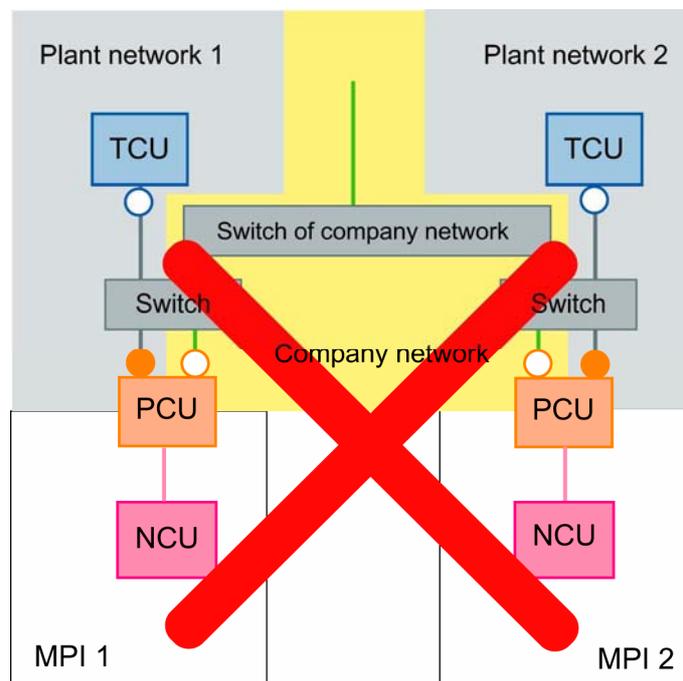
Hardware requirements

- Additional Ethernet card for PCU
- Crossed Ethernet cable (crossover) for direct connection of the TCU to the PCU
- Standard, uncrossed Ethernet cable for connecting the PCU to the company network
- For configuration option 2:
  Crossed Ethernet cable (crossover) between switch and company network

Options/restrictions

- Connection of the PCU to a company network possible
- Possible to connect a PG via Ethernet to the PCU on the system network or company network
- Only one NCU (to which the PCU is connected) can be operated and visualized at any one time
- It is possible to extend configuration option 1 by integrating the PCUs of several 1:(1:n) systems into the company network. Each of the 1:(1:n) systems must be configured separately.
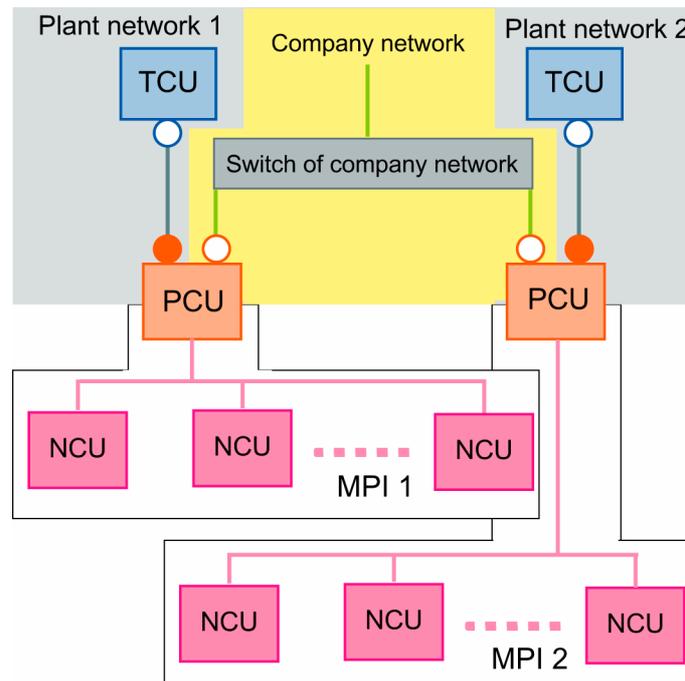
It is not possible to extend configuration option 2 by integrating the PCUs of several 1:(1:n) systems into the company network because address conflicts would arise between the system networks.
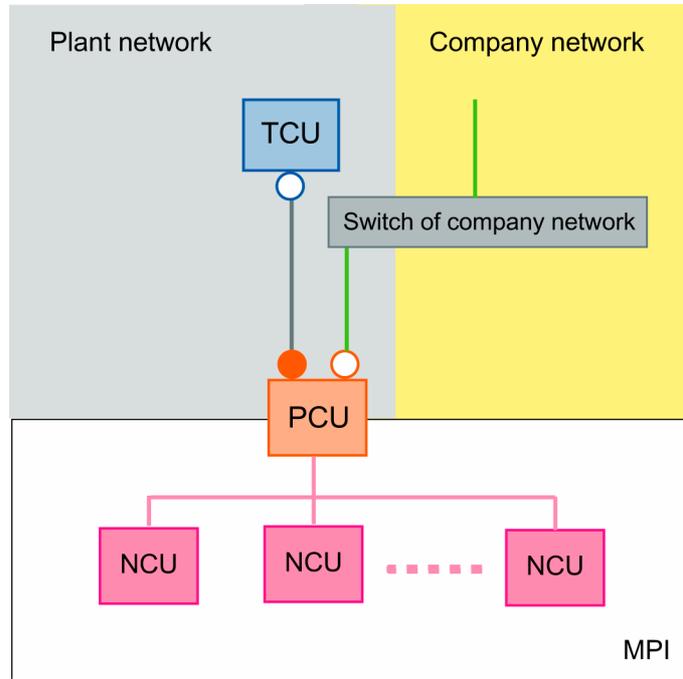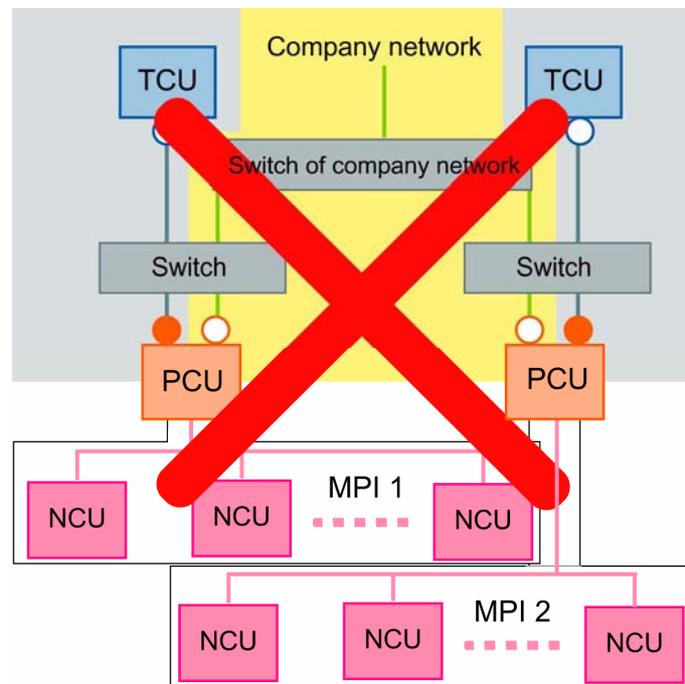

Installation and startup

- Operation of the PCU on n NCUs is conventionally configured in file NETNAMES.INI on the PCU.
- If you want to integrate several 1:(1:n) systems (or their PCUs) into the company network you must configure each system separately. Each of the systems can be configured identically.
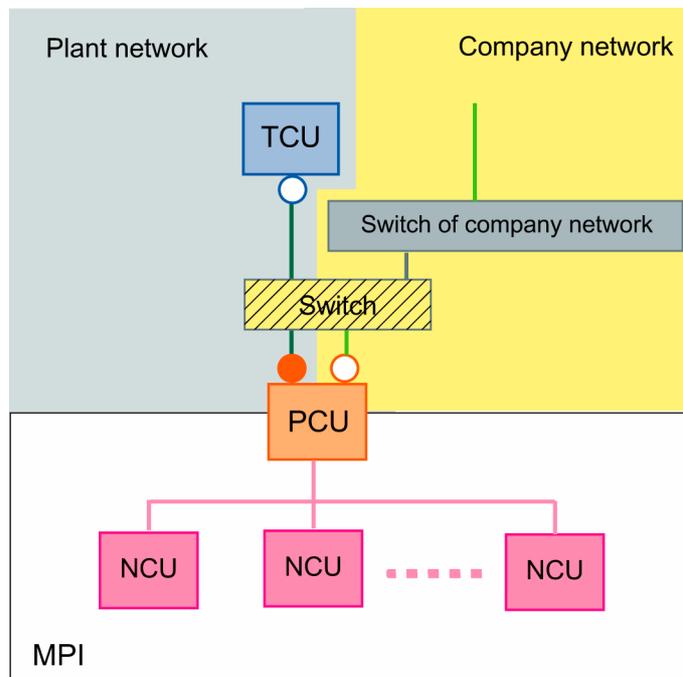
3.2.3 1:(m:1) with company network

Configuration option 1:

Either connect PCUs directly or bundled via a separate switch to the company network.

Configuration option 2:

Connections of the system network and connections of the company network are routed through a joint switch.

Prerequisite: The address range used for the system network does not collide with the company network. An autonomous sub-network for the system network is set up automatically.

Hardware requirements

- One additional Ethernet card per PCU
- One switch per system network
- For each PCU, two standard, uncrossed Ethernet cables for connecting the PCU to the system network and company network
- For each TCU, one standard, uncrossed Ethernet cable for connecting the TCU to the system network
- For configuration option 2:
  Crossed Ethernet cable (crossover) between switch and company network

Options/restrictions

- Connection of the PCU to a company network possible
- Possible to connect a PG via Ethernet to the PCU on the system network or company network
- Additional 1:(m:1) configurations can only be connected to the company network by means of a separate switch for each system network (physical separation of the system networks from each other and physical separation of the system networks from the company network).
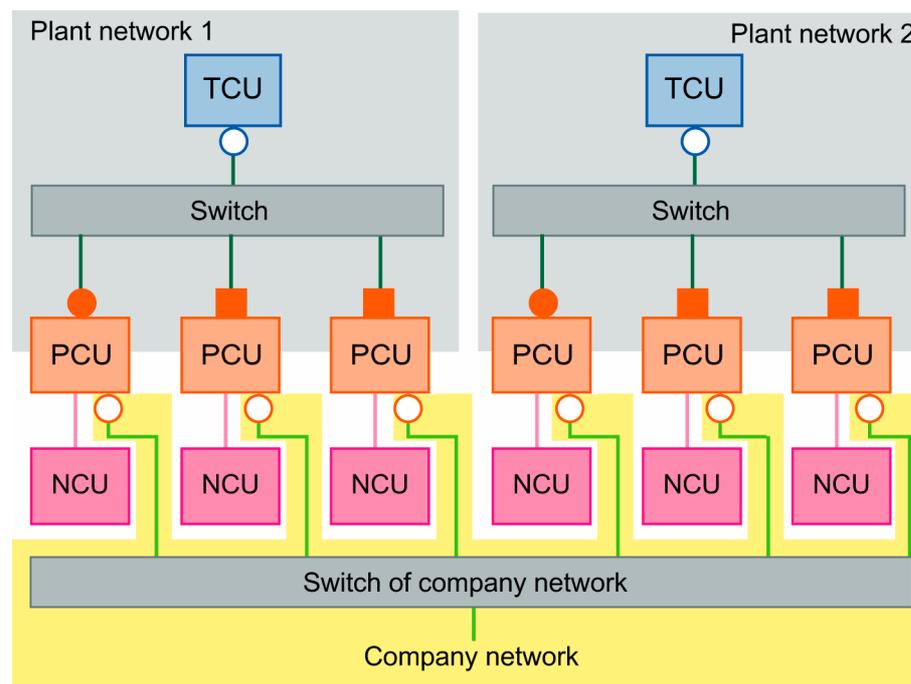
- It is not possible to extend configuration option 2 by adding several 1:(m:1) systems with a common switch for the system network and company network connections, as address conflicts would arise between the system networks.
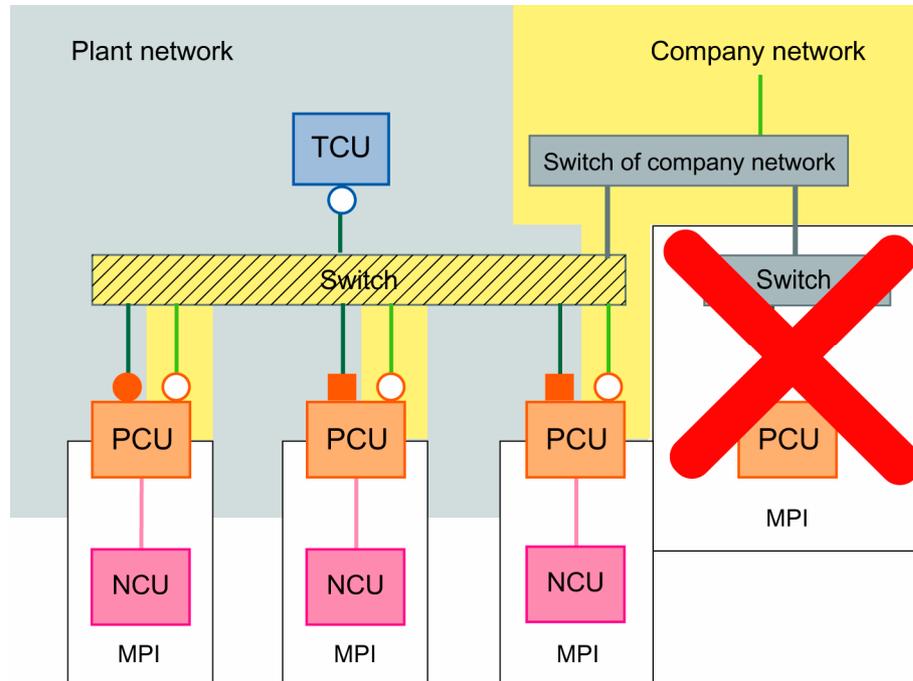
- Only one NCU (to which the selected PCU is connected) can be operated and visualized at any one time
- TCU can be switched to the various PCUs

Installation and startup

- Settings for the system network: see "1:(m:1) without company network"
- If you want to integrate several 1:(m:1) systems (or their PCUs) into the company network you must configure each system separately. Each of the systems can be configured identically.
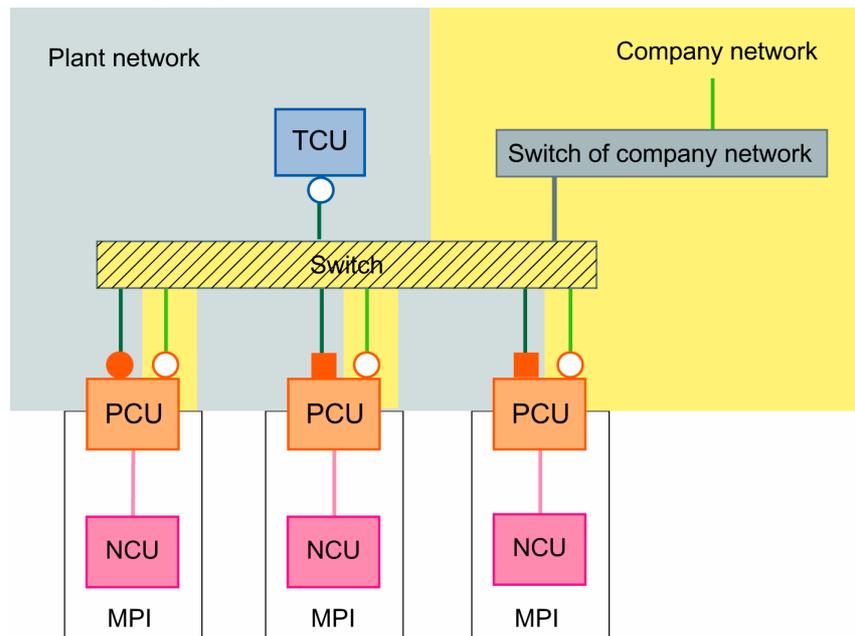
3.2.4 t:(1:1) with company network

Configuration option 1:

Configuration option 2:

Connections of the system network and connections of the company network are routed through a joint switch.
Prerequisite: The address range used for the system network does not collide with the company network. An autonomous sub-network for the system network is set up automatically.

Hardware requirements

- One additional Ethernet card per PCU
- One switch per system network
- For each PCU, two standard, uncrossed Ethernet cables for connecting the PCU to the system network and company network
- For each TCU, one standard, uncrossed Ethernet cable for connecting the TCU to the system network
- For configuration option 2:
  Crossed Ethernet cable (crossover) between switch and company network

Options/restrictions

- Connection of the PCU to a company network possible
- Possible to connect a PG via Ethernet to the PCU on the system network or company network
- Additional t:(1:1) configurations can only be connected to the company network by means of a separate switch for each system network (physical separation of the system networks from each other and physical separation of the system networks from the company network).
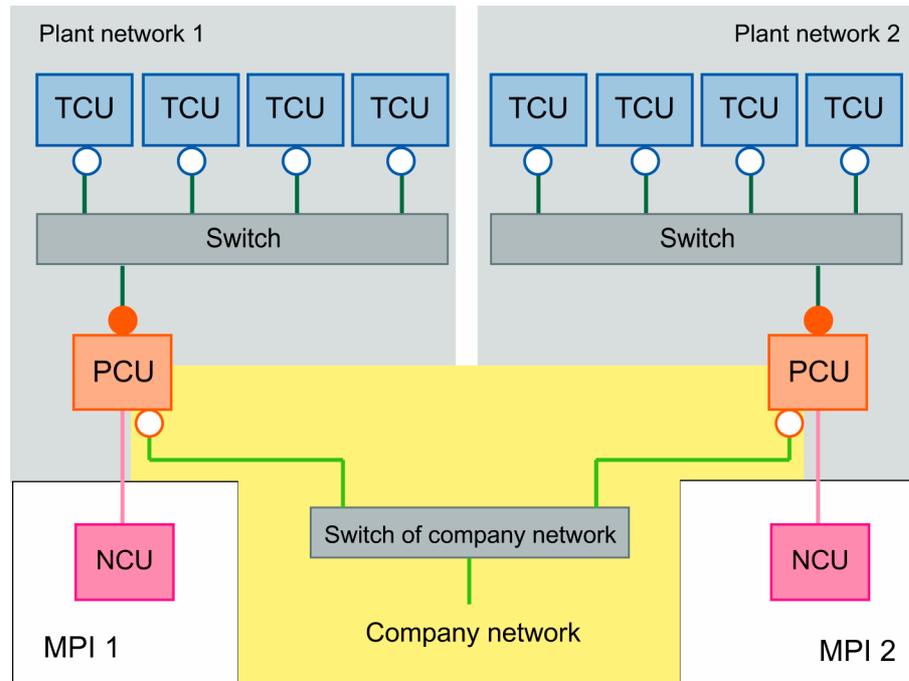
It is not possible to extend configuration option 2 by adding several t:(1:1) systems
with a common switch for the system network and company network connections,
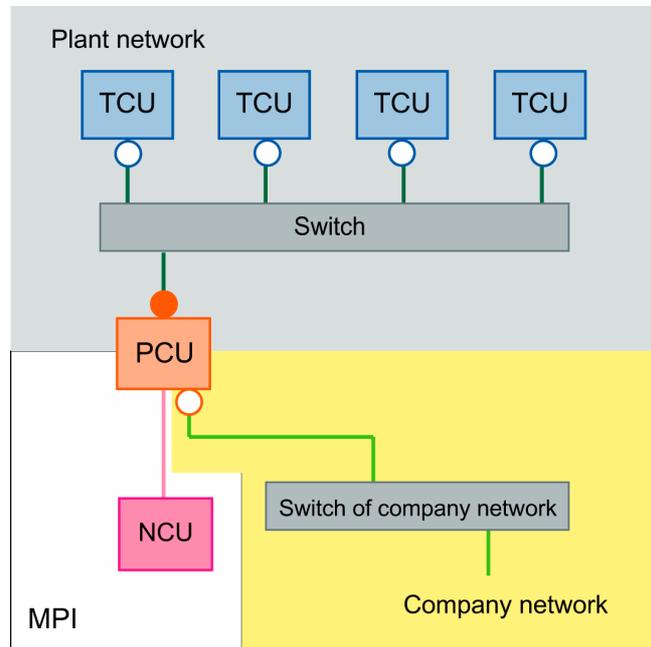as address conflicts would arise between the system networks.
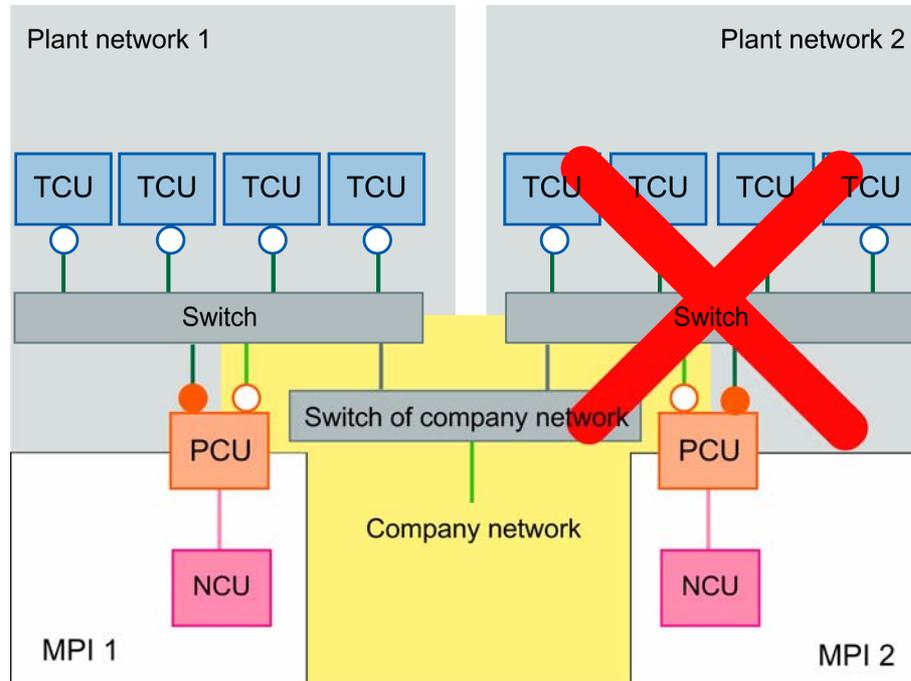
All TCUs show the same display.

Installation and startup

- Settings for the system network: see "t:(1:1) without company network"
- If you want to integrate several t:(1:1) systems (or their PCUs) into the
  company network you must configure each system separately. Each of the
  systems can be configured identically.
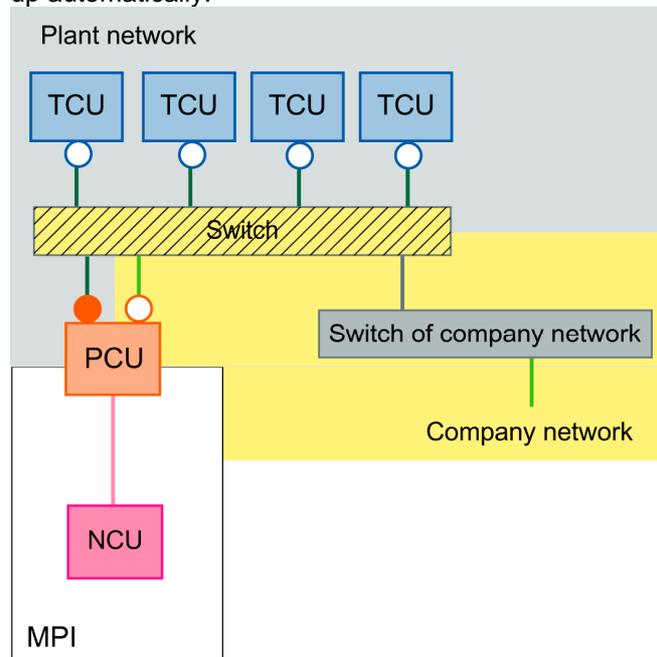
3.2.5 t:(1:n) with company network

Configuration option 1:

Configuration option 2:

Connections of the system network and connections of the company network are routed through a joint switch.
Prerequisite: The address range used for the system network does not collide with the company network. An autonomous sub-network for the system network is set up automatically.

Hardware requirements

- One additional Ethernet card per PCU
- One switch per system network
- For each PCU, two standard, uncrossed Ethernet cables for connecting the PCU to the system network and company network
- For each TCU, one standard, uncrossed Ethernet cable for connecting the TCU to the system network
- For configuration option 2:
  Crossed Ethernet cable (crossover) between switch and company network

Options/restrictions

- All TCUs show the same display
- Connection of the PCU to a company network possible
- Possible to connect a PG via Ethernet to the PCU on the system network or company network
- Every NCU can be operated and visualized with m:n operation on the PCU from every TCU via PCU
- Additional t:(1:n) configurations can only be connected to the company network by means of a separate switch for each system network (physical separation of the system networks from each other and physical separation of the system networks from the company network).
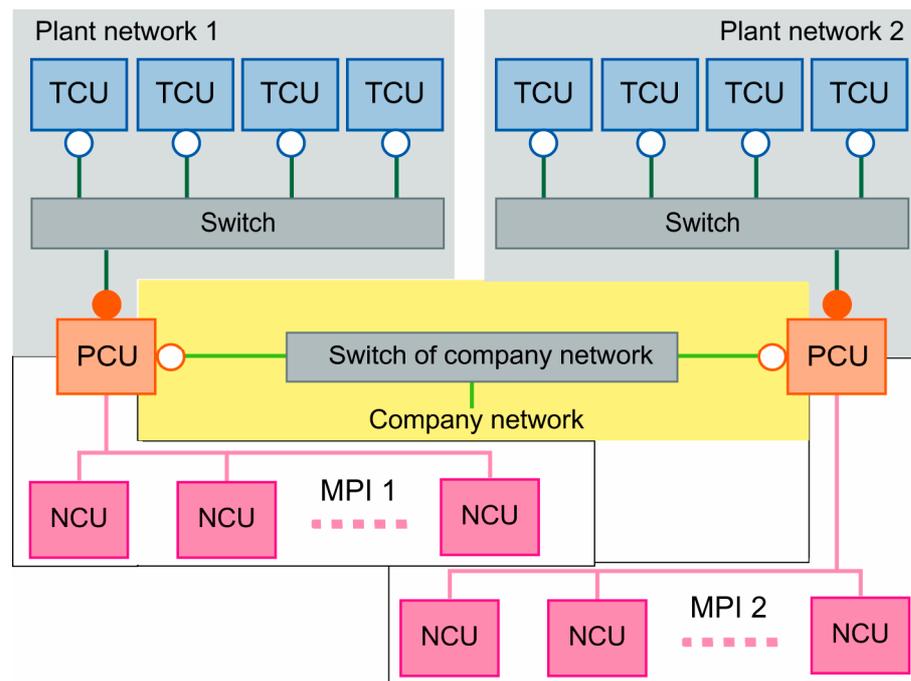
It is not possible to extend configuration option 2 by adding several t:(1:n) systems with a common switch for the system network and company network connections, as address conflicts would arise between the system networks.
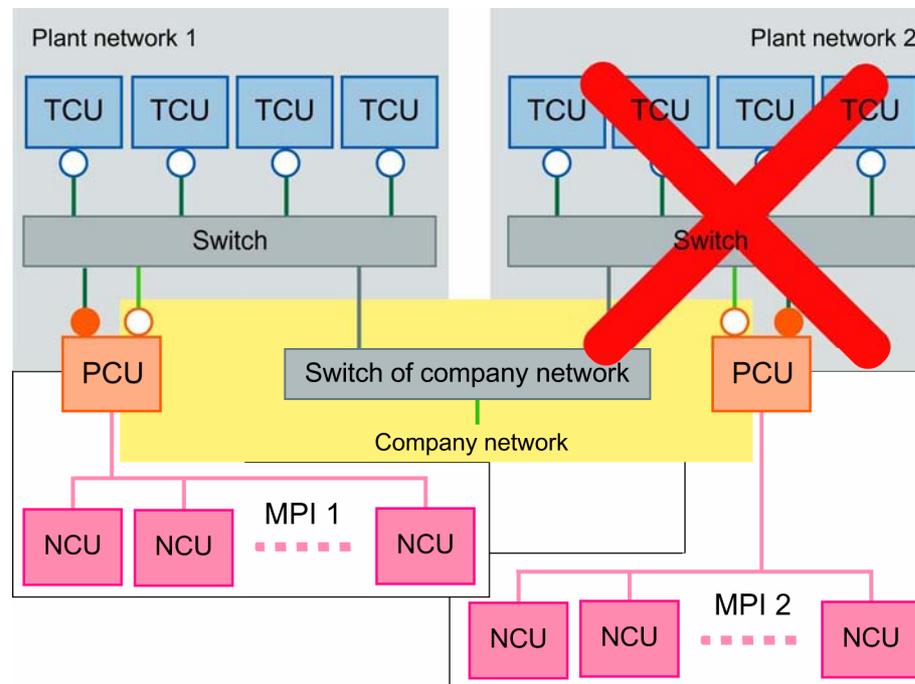
Installation and startup

- Settings for the system network: see "t:(1:n) without company network"
- Operation of the PCU on n NCUs is conventionally configured in file NETNAMES.INI on the PCU.
- If you want to integrate several t:(1:n) systems (or their PCUs) into the company network you must configure each system separately. Each of the systems can be configured identically.

■

4

4 Configuring Network Operation (SINUMERIK solution line)

4.1 Permissible network topologies

This chapter provides an overview of the permissible network topologies.

Ethernet connection

A SINUMERIK 840 D sl can only be operated as a network within which the individual components communicate with one another via Ethernet connections. This network must be set up.
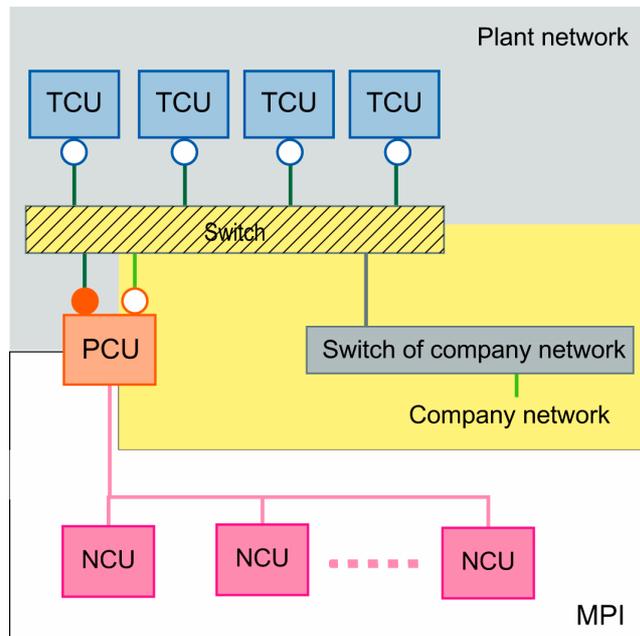
The individual components are factory-set so that the most frequently occurring standard configurations can be operated without changing the settings related to the network.

Division into system network and company network

On the SINUMERIK solution line, the components are generally split into a company network on the one hand and a system network on the other.

The connection to the company network provides access to the network drives, for example. On the system network, process data communication and image transmission runs from the components with operator software to the display units – the TCUs.

This split is performed physically by means of the prescribed use of the Ethernet interfaces on the components:

- A TCU is connected exclusively to the system network.

- An NCU is always connected to the system network via X120.

- Ethernet interface Eth 2 of the PCU 50.3 is preconfigured for connection to the system network; while Ethernet interface Eth 1 is used for connection to the company network.

- An NCU is connected to the company network via X130.

Meaning of the connections:

○	Eth 1 as a DHCP client
●	Eth 2 as a DHCP server
■	Eth 2 with a fixed IP address
Green connection	Uncrossed Ethernet cable
Gray connection	Crossed Ethernet cable (crossover)

4.2 Networks without connection to the company network

4.2.1 Configuration 1: NCU and TCU
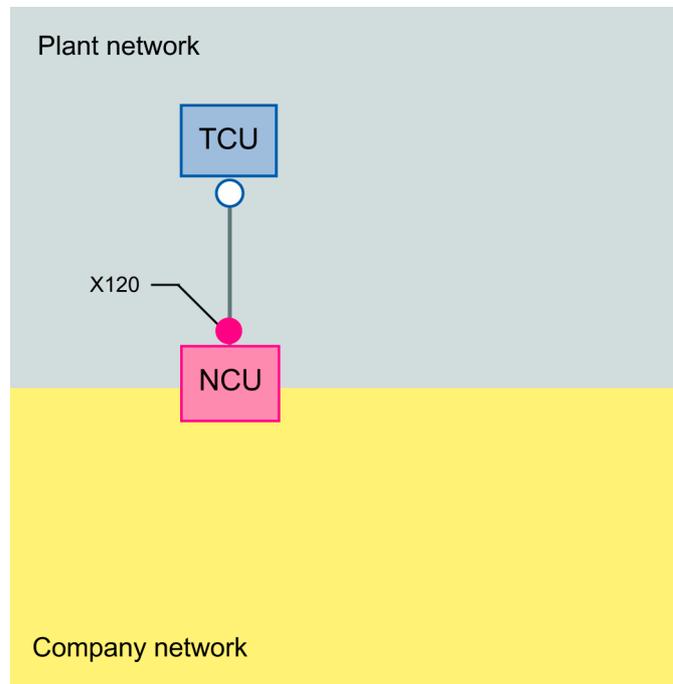
A direct Ethernet connection is used to connect a TCU to X120 of the NCU. NCU and TCU are suitably preconfigured so that IP addresses can be assigned.
The IP addresses are not significant for further operation.

The TCU is connected to the NCU via a **crossed** Ethernet cable.
The direct connection of the NCU via X120 to the TCU automatically forms a simple system network consisting of two computer nodes.

4.2.2 Configuration 2: NCU and PCU 50.3 with a direct OP
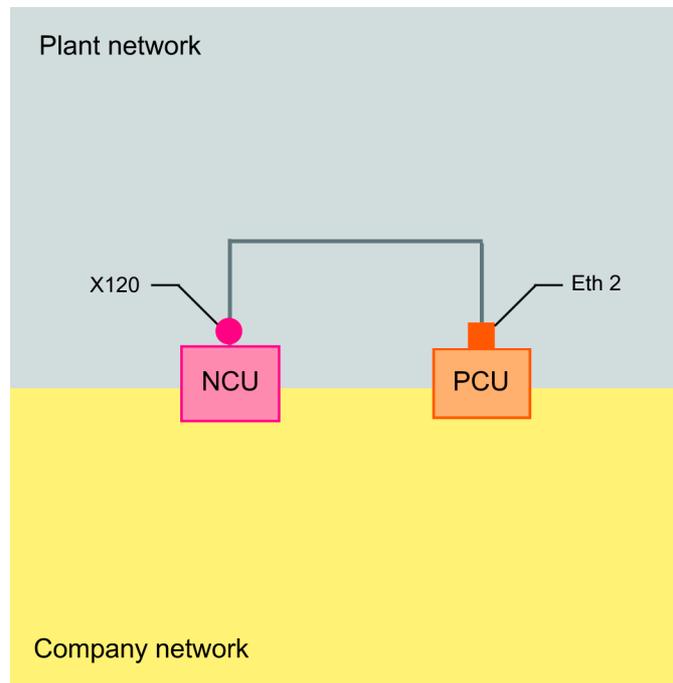
The NCU and PCU are connected via a crossed Ethernet cable.
On X120, the NCU occupies the fixed IP address 192.168.214.1 in its capacity as a DHCP server (not used in this configuration).

The DHCP server on the PCU, which is operating on Eth 2, must be deactivated.

For this Eth2 configuration, the PCU is assigned a fixed IP address in the range 192.168.214.241 – 192.168.214.249 with a subnet screen form 255.255.255.0.

4.3 Networks with NCU connection to the company network

4.3.1 Configuration 3: NCU and TCU
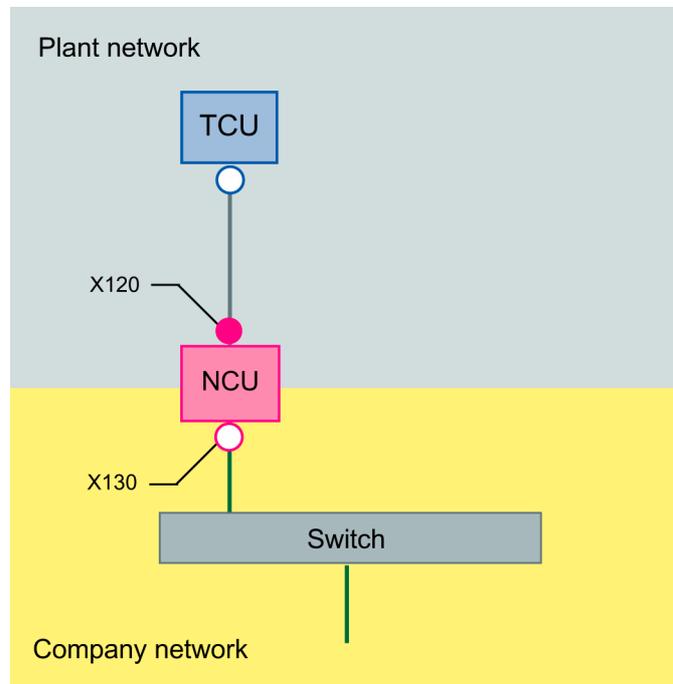
The TCU is connected to the NCU (directly) using a **crossed** Ethernet cable. On X130, the NCU is connected to a switch to the company network with a straight cable.

As in configuration 1, there is a direct Ethernet connection between a TCU and X120 of the NCU. NCU and TCU are suitably preconfigured with IP addresses. The IP addresses used here are not significant for further operation.

On X130, the NCU is set to the address reference via DHCP. If the company network has a DHCP server that provides the NCU with an IP address (IP configuration), the NCU is integrated into the company network.

Depending on the infrastructure available or the level of network administration of the company network, the following network parameters must be set for the NCU on X130:

- Computer name on the company network
- Address of a DNS server
- Address of a gateway (default router)

The IP address of the NCU to this connection is also assigned via network administration.

If the company network offers a low level of administration (in the worst case scenario the network has only one DHCP server that assigns the addresses from a predefined address range) the NCU receives an IP address that is initially unknown. See "Determining the address of the NCU"

4.3.2 Configuration 4: NCU and PCU 50.3 with a direct OP
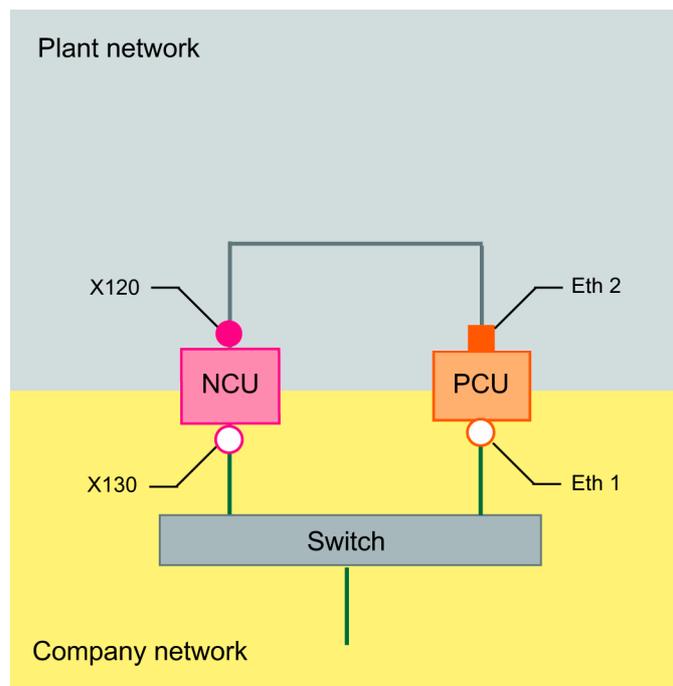
The NCU and PCU are connected via a **crossed** Ethernet cable.

On X120, the NCU occupies the fixed IP address **192.168.214.1** in its capacity as a DHCP server (not used in this configuration). For this Eth 2 configuration, the PCU is assigned a fixed IP address in the range **192.168.214.241 – 192.168.214.249** with a subnet screen form **255.255.255.0**.

The DHCP server on the PCU, which is operating on Eth 2, must be deactivated.

The observations made for configuration 3 also apply here in relation to the connection to the company network. The connection to a switch on the company network is made via a **straight** Ethernet cable.

4.3.3 Configuration 5: PCU with TCU on NCU
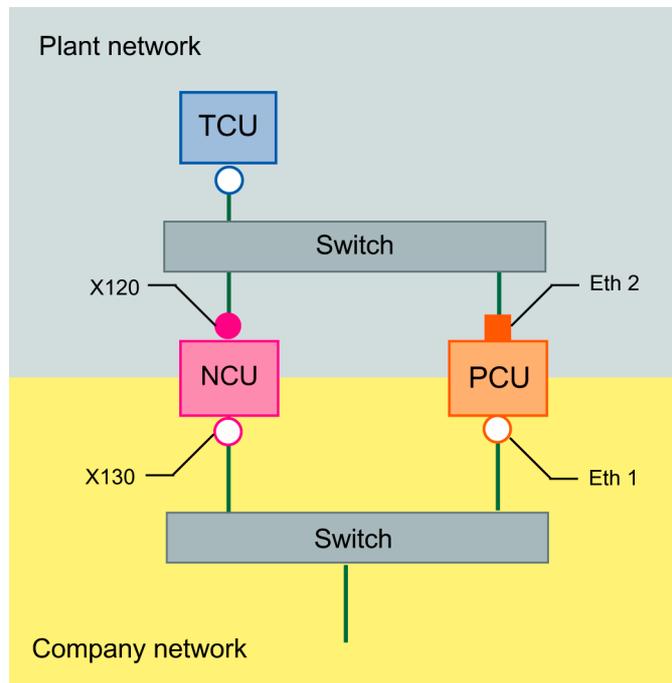
In this configuration, a switch is also required for the system network. All components are connected using straight Ethernet cables.

In terms of address allocation and the settings that need to be made, this configuration is identical to that of configuration 4. However, in this case, the DHCP server of the NCU actually supplies the TCU with an IP address and serves as a boot server for the TCU.

The observations made for configuration 3 also apply here in relation to the connection to the company network. The connection to a switch on the company network is made via a **straight** Ethernet cable.

A CONFIG file must be created for the TCU and stored on the NCU for a TCU to be able to connect to both HMI systems. The config files for the TCUs are located on the NCU under the path /user/common/tcu/ftp_tcu/tcux with the structure as described in the following chapters.
→ "File structure on PCUs and NCUs"
→ "Configuring the TCUs on the system network"

4.3.4 Connecting the programming device to the NCU

Valid for: SINUMERIK solution line

A programming device is connected to the NCU on X127 as a standard DHCP client. An NCU is a standard DHCP server on X127. On X127, the NCU occupies the fixed IP address 192.168.215.1 with the subnet screen form 255.255.225.224.
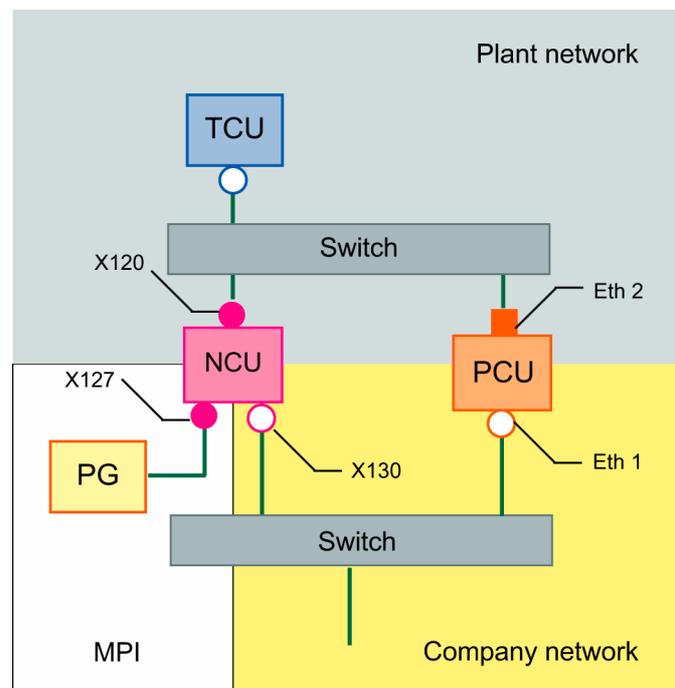
On X127, an address is assigned for connecting a programming device in the range 192.168.215.10 – 192.168.215.30. This address enables the NCU of a HMI to be addressed from the programming device.

■

5

5 Diagnostics

SINUMERIK 840D sl/840D/840Di/810D Commissioning Basic Software (IAM2) – 08/2005 Edition   IM5/5-71

5.1 Booting the TCU

Note

The functions "F1" to "F8" referred to in this chapter are selected with the horizontal softkeys on the OP. If you want to select "F7", for example, you must press horizontal softkey 7.

5.1.1 Messages during booting

While the TCU is booting, progress is displayed after the BIOS has booted and before the operating system is loaded. In addition to messages, the current booting status is also indicated by a progress bar. While the IP address is being determined via DHCP and the TFTP is being downloaded (boot image), a progress bar indicates that booting of the TCU is not yet complete, or that a fault has occurred.

The structure of these messages is shown below:
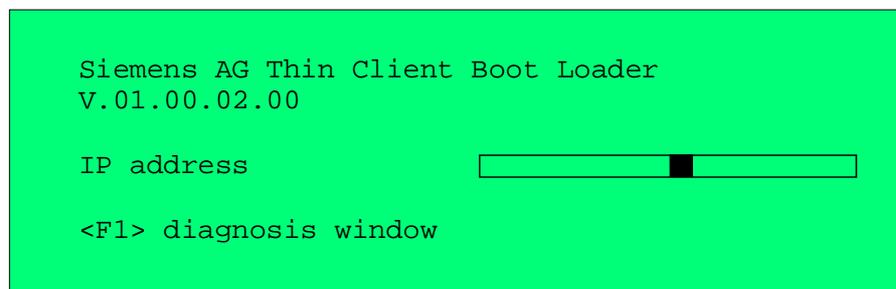
```
Siemens AG Thin Client Boot Loader
V.01.00.02.00

IP address                    [        █        ]

<F1> diagnosis window
```

You can see the current boot phase in the third line. Below that you are told whether you can call up information via "F1" if a fault occurs.

5.1.2 Faults during booting

If you select function "F1" while the TCU is booting or if a fault or warning occurs, the diagnostics window appears and booting of the TCU is interrupted.

Calling up the diagnostics window with "F1"

```
Siemens AG Thin Client Boot Loader                        V.01.00.02.00

 Boot progress:

 BIOS V.00.00.03.00                          06/08/2004 11:45:07
 MAC address                                 08:00:06:00:00:00
 IP address                                  received 192.168.214.40
                                             DHCP    192.168.214.1
                                             TFTP    192.168.214.1

 OS boot loader (nonfree/linx_tcu.bin)       done




 <F1>details                            <F7>continue     <F8>reboot
```

The following options are available to you:

Function	Effect
F1	Display detailed Information
F7	Continue booting of the TCU
F8	Reboot the TCU

Continue with "F1"

If you select function "F1" in the diagnostics window, the following window opens:

```
Detail messages (level 3)    Siemens AG Thin Client Boot Loader    V.01.00.02.00

 ***   Siemens AG Thin Client Boot Loader Start (real to protected mode)  [01.00.02.00] ***
 Bldr16-->32: V.00.00.03.00 06/08/2004 11:45:07
              addresses 0xFFFFE34F 0xFFFFE2ED 0xFFFFE2E0
 Bldr16-->32: bldr32 at address 0xFFFB0000 length 43008
 Bldr16-->32: RLE header BLDR_TCU_RLE___  69632  42640 0x3A61F8B3
 ...
 ...
 PCI: found ethernet adapter (dp83815/16) [address 0000EF00, irq 00000009, type 00000005]
 ...
 ...
 DHCP: send DHCP_V_DISCOVER [server IP address 0x00000000 XID 0x06050004]
 ...
 DHCP: received DHCP_ACK [server IP address 0x01D6A8C0]
 ...
 DHCP: IP 192.168.214.40 DHCP 192.168.214.1/00:04:75:04:95:47 TFTP 192.168.214.1/00:04:75:05:95:48
 ...
 ...




 <F1>up    <F2>down       <F3>page up    <F4>page down      <F5>home    <F6>end
 <F7>more details           <F8>less details               <F9>recall
```

The following options are available to you:

Function	Effect
F1 through F6	Navigate within the window (Alternatively, you can also use the corresponding keys on the OP.)
F7	Display more information
F8	Display less information
F9	Return to diagnostics window

Continue with "F7"

If you select function "F7" in the diagnostics window, booting of the TCU continues: If booting is not yet complete, you can interrupt the boot procedure again with "F1".

The diagnostics window is displayed automatically in the event of a fault:
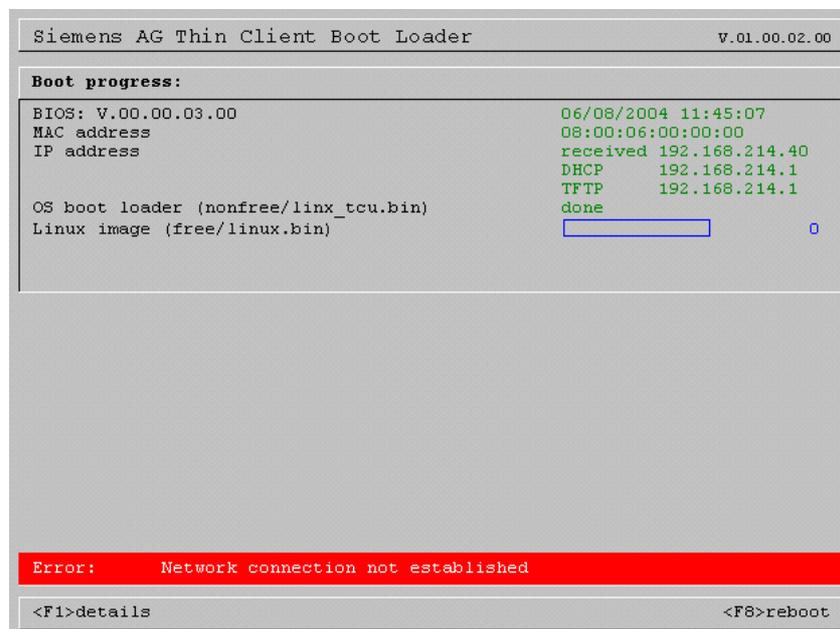
```
Siemens AG Thin Client Boot Loader                        V.01.00.02.00

Boot progress:

BIOS: V.00.00.03.00                          06/08/2004 11:45:07
MAC address                                  08:00:06:00:00:00
IP address                                   received 192.168.214.40
                                             DHCP    192.168.214.1
                                             TFTP    192.168.214.1
OS boot loader (nonfree/linx_tcu.bin)        done
Linux image (free/linux.bin)                 [          ]        0




Error:      Network connection not established

<F1>details                                              <F8>reboot
```

The following options are available to you:

Function	Effect
F1	Display detailed Information
F8	Reboot the TCU

If the diagnostics window is already active and a warning message appears, it is displayed inside the window.
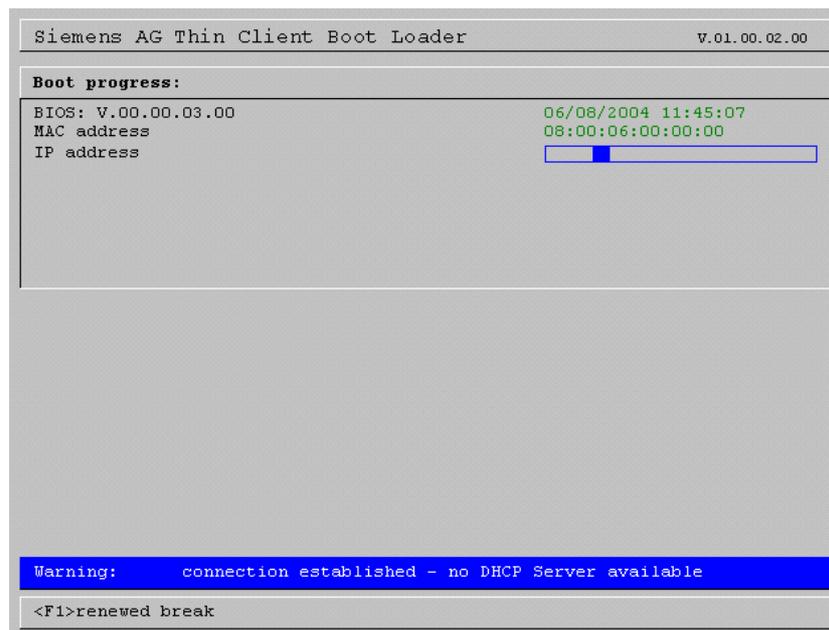
```
┌─────────────────────────────────────────────────────────────────────┐
│  Siemens AG Thin Client Boot Loader              V.01.00.02.00        │
│ ┌─────────────────────────────────────────────────────────────────┐ │
│ │ Boot progress:                                                    │ │
│ └─────────────────────────────────────────────────────────────────┘ │
│  BIOS: V.00.00.03.00                     06/08/2004 11:45:07          │
│  MAC address                             08:00:06:00:00:00            │
│  IP address                              [    ■    ]                  │
│                                                                       │
│                                                                       │
│                                                                       │
│                                                                       │
│                                                                       │
│                                                                       │
│                                                                       │
│                                                                       │
│ ┌─────────────────────────────────────────────────────────────────┐ │
│ │ Warning:     connection established - no DHCP Server available     │ │
│ └─────────────────────────────────────────────────────────────────┘ │
│  <F1>renewed break                                                    │
└─────────────────────────────────────────────────────────────────────┘
```

The following options are available to you:

Function	Effect
F1	Display detailed Information

5.2 Special key combinations

Notice

These operator input sequence steps must only be carried out by qualified personnel.

You can operate the HMI Advanced software on the OP of the TCU in exactly the same way as you do on the OP connected directly to the PCU. All keys have the same functions as on the directly connected OP.

The following differences apply:

Requesting the operator focus

On a TCU that has no operator focus, the first key that is pressed serves exclusively to request the operator focus, i.e., this key is not evaluated by HMI Advanced.

The settings for the right to veto are stored in file F:\TCU\SERVICES\TCU.INI and only take effect if HMI Advanced is installed on the PCU.

Selecting a PCU

If connection options to several different PCUs are set for a TCU in the CONFIG file, the key combination "Recall" + "Menu select" opens the "VNC Starter" window on the TCU (corresponds to the key combination F9 + F10 on an external keyboard). In the window, the user can select the PCU to which a new connection should be created using the horizontal softkeys.
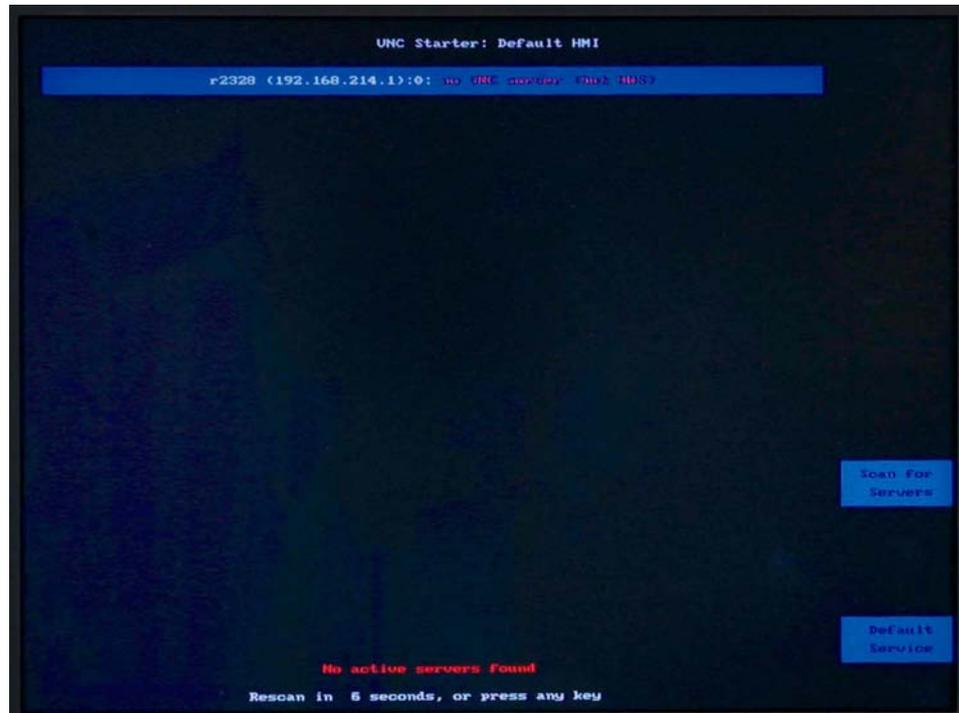
Fig. 5-1: Switchover to VNC Starter

The key combination "Recall" + "Menu select" is not evaluated by HMI Advanced.

Further information on the service shell can be found in: /IM7/ Installing the NCU sl

Recalibrating the touch panel (TP)

The key combination below can be used to carry out further calibration during operation without a restart:
ALT + F9 + F10 (corresponds to the ALT + Recall + Area Switchover key combination on an OP).

Note

The "Touchware" program, which is available with Windows XP, is deactivated on the TCU.

■

A

A Appendix

A.1 General Public License (gpl.txt)

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/* zlib.h -- interface of the 'zlib' general purpose compression library version 1.2.1,
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SINUMERIK 840D/840Di/810D

Commissioning CNC Part 5 (Basic Software)

Commissioning PCU Basic Software (IM6)

Valid for

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Software	*Software version*
PCU basic software	7.5

Contents

1

1 Commissioning a System

1.1 Delivery condition of the PCU

1.1.1 Hardware

Hardware

HMI software is based on a computing unit linked to an Operation Panel OP…
The computing unit on which the HMI (human machine interface) software runs is
called a "PCU".

PCU properties

Depending on the PCU model, either Windows NT 4.0 **or** Windows XP may be
installed on the PCU hard disk. In the case of PCU models that allow for both of
these options, the desired operating system has to be predefined using the
appropriate order number.

Note

Details of how to replace PCU and OP/TP components can also be found in the
Operator Components Manual. Please refer to the latest /BU/NC 60 ordering
information catalog for available component combinations.

References: /BH/, Operator Components Manual

In-system communication

In-system communication between the PCU and NCU/PLC takes place via the
operator panel front interface, OPI (1.5 Mbaud) or MPI (187.5 kbaud).

Hard-disk memory space

The following memory space is available on the PCU50/70 hard disk:

Drive D:	1.8 GB reserved for local backups
Drive F:	3 GB reserved for user data (programs, applications, languages, data, etc.) besides the 5-language HMI Advanced that is installed

High memory map in drive F: can lead to a local partition backup becoming so
large that it can no longer be saved locally on drive D:. In this case, the GHOST
image (hard-disk backup) must be stored on an external device.

1.1.2 Partitioning the hard disk

Division of the hard disk

The PCU hard disk is segmented to enable the software packages to be separated into four partitions with different file systems.

The hard-disk partitioning corresponds to the grouping that is required for installing the HMI system software onto the PCU using Windows NT 4.0 or Windows XP. Windows XP can be used with PCU 50 V2 (566 MHz or 1.2 GHz, 10 GB hard disk or larger).

- 3 primary partitions and 1 expanded partition are created (hard disks below 4.8 GB in size are not supported).

- As well as Windows NT 4.0 or Windows XP (with the HMI system software), DOS (with the Service menu) can also be booted (dual booting).

- Depending on the order details, the HMI system software may be pre-loaded on delivery. It is installed subsequently by the customer the first time the system is ramped up.

- To ensure data integrity, the HMI system software, the Windows NT/XP system software and DOS with the Service menu are distributed on different partitions.

The figure below shows how partitioning is used when installing HMI system software (partition names are given in italics).
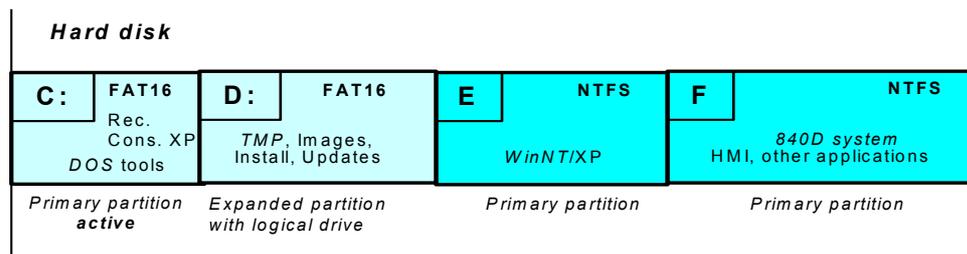
Fig. 1-1: Back up hard disk

Content of the partitions

The individual partitions are intended for the following data:

Partition C   Partition C contains DOS 6.2 together with the tools and scripts created by the Service menu (e.g., Ghost tools).

Partition D   Partition D is used for Ghost images, i.e., stored images (e.g., those supplied with the system) and local backup images. The Windows NT system software is also stored, which can be loaded as an update if required or when installing a driver, for example. Partition D also contains the installation directory where the software to be installed is first copied to from a remote PG/PC, prior to the actual installation procedure.

Partition E   Partition E is reserved for the Windows NT/XP system software.

Partition F   Partition F is intended for installing user programs: Applications such as HMI system software (incl. data storage and temporary data), STEP 7, OEM applications for HMI, or customer-specific applications should only be installed here.

Note

We strongly recommend that you install all applications in Partition F only. The size of the given partitions depends on the size of the hard disk and the Windows system.

1.1.3 Supplied software on the PCU

The software installed on delivery of the PCU includes the components below, among others:

	MS Windows NT 4.0 SP6a	MS Windows XP Professional SP2
Internet Explorer	V 5.5 SP2 (+ Security Update)	V 6.0
MS-DOS	SW 6.21	SW 6.21
MPI driver	V 05.08	V 6.02
USB	V 4.2	V 5.64 SR4
Norton Ghost *(default setting)*	V 6.01	V 7.5 *(*incl. Ghost Explorer)
Symantec Ghost Symantec Ghost Walker	V 7.5 V 7.5.0.335	V 7.5 V 7.5.0.335

Documentation for all Ghost tools is supplied on the PCU's hard disk under path C:\TOOLS.

Note

Notes on using the PCU basic software can be found in file *C:\Siemensd.rtf*.

The versions of the Service menu (and Windows NT) system components contained in the PCU basic software can be found in file *C:\BaseVers.txt.*

The PCU basic software can be extended using HMI system software for operating Siemens SINUMERIK or OEM software for specific requirements. The **Service menu**, which is part of the PCU basic software, is used to perform the extension.

System settings

For reasons of security, Windows XP is preset as follows when updating to SP2:

- The Autorun function is deactivated.
- Automatic Windows Update is deactivated.
- Monitoring and alerts for antivirus software and automatic update are deactivated.
- Links used to call up Internet Explorer from the desktop and the Start menu are removed.
- Remote Procedure Call (RPC) is possible for calls that are not connected.

Changes to Windows services

Other default settings:

Windows services:	Start-up type:	
Computer Browser	Manual	(Not started)
Error Reporting Service	Disabled	
Portable Media Serial Number	Manual	(Not started)
SSDP Discovery Service	Disabled	
Universal Plug and Play Host	Disabled	
Web Client	Manual	(Not started)
Wireless Zero Configuration	Manual	(Not started)

Firewall settings

Firewall settings are activated on the on-board Ethernet network card. The firewall settings are also activated if an additional Ethernet card is installed. The firewall settings for the second network card are not deactivated until the "PCU basic software Thin Client" is installed.

Service menu

The Service menu is implemented using DOS. The Service menu is used to start a software install/update, which is then performed by Windows NT/XP (following a reboot). Data backup functions (Backup/Restore) are also carried out using the Service menu.

The Boot Manager can be used to select between ramping up a SINUMERIK system and the Service menu.

ServiceCenter

If a configuration contains one or more TCUs, data backup/restoration cannot be carried out with service programs on the DOS level.

This is why the SINUMERIK desktop (Windows NT/XP) provides a link to the "ServiceCenter" program (see Section 4.3).

1.1.4 BIOS delivery settings

The settings apply to: PCU 50 V2 with 566 MHz or 1.2 GHz

The BIOS parameters below are saved on delivery:

(*Italics:* automatic setting that cannot be changed)

Name	PCU 50 V2
Main	
System time [1]	*hh:mm:ss*
System date [1]	*MM/DD/YYYY*
Floppy disk A:	1.44 MB, 3 ½" (conn. ext. $\Rightarrow$ also disable FD test)
Primary master C:	10056 MB (currently) or larger
Primary slave	None
Secondary master	None
Secondary slave	None
Memory cache	Write back
Boot options	
Quick boot mode	Enabled
SETUP prompt	Enabled
POST errors	Enabled
Floppy check	Disabled
Summary screen	Disabled
Keyboard features	
Num Lock	Off
Key click	Off
Keyb. auto-repeat rate	30/s
Keyb. auto-repeat delay	1/2 s
Hardware options	
PCI-MPI/DP:	Enabled
On-board Ethernet	Enabled
Ethernet address [1]	*08000624xxxx*
LAN remote boot	Enabled
Cardbus/PCMCIA slot	Enabled
Fan control	Enabled
SafeCard functions	Enabled
Legacy USB support	Enabled
CRT/LCD selection	SIMULTANEOUS
CRT 640 x 480	75 Hz
CRT 800 x 600	75 Hz
CRT 1024 x 768	75 Hz
LCD screen size	Graph & text expanded
DSTN contrast	154
Trackball/PS2 mouse	Auto
Advanced	
COM/LPT	Configuration
Internal COM1	Enabled
Base I/O address	3F8
Interrupt	IRQ4
Internal COM2	Enabled
Base I/O address	2F8
Interrupt	IRQ3
Internal LPT1	Enabled
Mode	EPP

Name	PCU 50 V2
Base I/O address	Not applicable
Interrupt	IRQ7
DMA channel	Not applicable
PCI configuration:	
PCI device slot 1	
Option ROM scan	Enabled
Enable master	Enabled
Latency timer	0040 h
PCI device slot 2	
Option ROM scan	Enabled
Enable master	Enabled
Latency timer	0040 h
Ethernet	**On-board PCI**
Option ROM scan	Disabled
Enable master	Disabled
Latency timer	0040 h
PCI/PnP ISA IRQ exclusion	
IRQ3	Available
IRQ4	Available
IRQ5	Available
IRQ7	Available
IRQ9	Available
IRQ10	Available
IRQ11	Reserved
PCI IRQ line 1	Auto-select
PCI IRQ line 2	Auto-select
PCI IRQ line 3	Auto-select
PCI IRQ line 4	Auto-select
Installed O/S	Other
Reset config. data	No
Floppy disk controller	Enabled
Local bus IDE adapter	
Large disk access mode	DOS
Hard disk pre-delay	Disabled
Memory gap at 15 MB	Disabled
Security	
Supervisor password is	Disabled
User password is	Disabled
Set supervisor password	[Enter]
Set user password	[Enter]
Password on boot	Disabled
Fixed disk boot sector	Normal
Floppy disk access	Supervisor
Power	
APM	Enabled
Power savings	Disabled
Standby timeout	Off
Suspend timeout	Off
Hard disk timeout	Disabled
Fan control	Enabled
Boot sequence	

Name	PCU 50 V2
	Hard drive
	Removable devices
	CD-ROM drive
	IntelBootAgent (IBA)
Component	SINUMERIK PCU 50
BIOS version	V02.03.04
BIOS number	- A5E00124434-ES01
MPI/DP firmware [1]	
CPU type [1]	*PENTIUM III*
CPU speed [1]	866 MHz
CPU ID [1]	
Code revision [1]	

Changing BIOS settings

Once additional components have been installed or attached, it may be the case that the system has to be informed of this via the BIOS setup.

You can activate this via the operator panel front as described below.

1. Ramp up the device.
2. When the prompt to activate the BIOS setup appears, press the <F2> key (corresponds to horizontal softkey 2 on the OP). The BIOS setup menu appears.
3. In the menu, use the cursor keys to navigate to the desired selection box.
4. Change the setting using the + key (press <SHIFT> and <X> at the same time) or the <–> key (on the numerical keypad).
5. If you wish, you can reach other setup menus using the right/left cursor keys.
6. Press <Escape> (<Alarm Cancel> key) to go to the "Exit" menu (or press the right cursor key again).
7. Press the <Enter> key to exit the setup menu.

The system then ramps up (see the Operator Components Manual).

Note

With the exception of the boot sequence and the LPT mode (EPP, EPC), an OEM contract must be concluded in order to make changes to the BIOS settings.

1.1.5 Installing and activating software

Windows NT or Windows XP is preinstalled on the PCU. The "PCU basic software" is comprised of the Windows system together with the service tools described below.

Service menu (under DOS)

The Service menu is used to install software and back up data.
- Transferring/extending HMI system software
- Installing HMI system software via a network
- Saving data on a hard disk (Backup/Restore).

The Service menu is activated during ramp-up and is described in the "Service menu functions" section.

SINUMERIK desktop

The Windows area is intended for the service function, which can use the Windows features to commission the controller.
- Installing HMI system software via a network
- Installing additional software (e.g., installing additional languages)
- Changing INI files/HW configuration (e.g., installing drivers)
- Setting the HMI software runtime environment
- Activating the SIMATIC STEP 7 license key disk
- Performing system checks (e.g., version check, disk check, etc.)
- Installing and parameterizing UPS software

Calling up the SINUMERIK desktop
1. Via DOS Service menu: menu item 4, then 1
or:
2. When the version display appears on the bottom right of the screen during ramp-up, press key "3".
3. Enter the password.
4. Select the first menu, "SINUMERIK desktop", and confirm your selection with the Enter key.

The SINUMERIK desktop appears on the screen (see the "SINUMERIK desktop functions" section).

1.2 PCMCIA interface software

The PCU 50/70 has an interface for PCMCIA components. Provision of the interface software varies for Windows NT and Windows XP.

PCMCIA interface software for Windows NT

CardWare V6.0 software for Windows NT (single license) is available to allow memories/devices to be used in conjunction with this interface.

Delivery	The software is supplied on CD together with a readme file (in English).
Requirements	Windows NT 4.0 with Service Pack 6 is required.
Installation	Establish a connection between the PCU 50/70 and the CD drive as described in "Setting up access to external drives/computers".
	Start SETUP.EXE on the CD.
	Follow the operator prompting in InstallShield.
Restrictions	The current restrictions can be found in PRODIS.

Usable media

Before removing a flash card, you should ensure that it is switched to "Slot Power Off".

Once the CardWare V6.0 software is installed, the PCMCIA interface is ready to operate the following components (plug and play):

- PCMCIA network card 3Com Megahertz 589E
- PCMCIA card Xiron RealPort Ethernet 10/100 + Modem56 REM56G - 100
- PCMCIA flash card Toshiba TH6SS160402A (40 MB)
- SanDisk 32 MB flash disk PCMCIA/PC CARD ATA
- Callunacard 1040 MB Type III hard disk drive

The manufacturers of the CardWare V6.0 software run a PC card knowledge base on their Website, where you can find other PCMCIA components that are supported.

Notes on use

Before removing a flash card, you should ensure that it is switched to "Slot Power Off". This software is not intended for use with SINUCOPY, which did not form part of testing.

After ramping up Windows NT 4.0, CardWare takes around 30 seconds to become active. This does not affect the ramp-up of PCU 50/70 with HMI Advanced. CardWare V6.0 is not intended for use with Windows 2000.

Address of the software supplier:

APSoft
Sonnenstrasse 26b
85622 Feldkirchen, Germany
Internet: www.tssc.de
Phone: +49 (0)89 900 479 0
Fax: +49 (0)89 900 479 11

PCMCIA interface software for Windows XP

Standard PCMCIA applications are supported directly by Windows XP.

1.3 System ramp-up

1.3.1 Powering up the system

Requirements

Before connecting the PCU to the power supply, unlock the hard disk and connect an operator panel front and the keyboard and display/monitor peripherals.

With the PCU 50/70 power supply switched off, insert the peripherals' connecting cables into the corresponding sockets on the interface side of the PCU.

Once the peripherals have been connected, the device is ready.

Information about how to adjust and set your interface and the required connecting lead can be found in the User Guide that goes with the peripheral.

Connecting the power supply

The PCU 50/PCU70 is supplied with 24 V DC.
References: /BH/, Operator Components Manual

Switching on and switching off

There is no power switch available, meaning that the power supply is switched on and off by inserting or removing the power-supply connector.

Note

When connecting peripherals, please make sure that the components are suitable for industrial use.

Caution

When inserting or removing peripheral connections (keyboard, mouse, printer, etc.), the peripherals and the PCU must be disconnected from the power supply. Otherwise, they can become damaged. This does not apply to USB connections.

1.3.2 Ramp-up for first commissioning

System ramp-up (Boot Manager)

When ramping up the PCU, you can select the SINUMERIK system or the Service menu from the Boot Manager menu.

- **SINUMERIK: SINUMERIK system**
  This takes you to the beginning of the HMI system software or (for service purposes) to the SINUMERIK desktop (Windows XP).

- **[hidden menu entry]: Service menu**
  The Service menu under DOS is used to transfer software to be installed (e.g., if no network is available) and data backup.

- **[hidden menu entry]:**
  Recovery console (Windows XP)
  Details on this can be found in the original MS literature, under "Starting Windows Recovery Console".

First commissioning

On **first** commissioning, the software that was ordered and loaded onto the hard disk (SINUMERIK products, possibly including HMI Advanced software) is installed as follows under Windows NT/XP:

```
Welcome to SINUMERIK
These SINUMERIK products will be installed now:

    <product 1>
    <product 2>
    <product 3>
    ...
Install NOW

Install at NEXT REBOOT

CANCEL Installing
```

Scope of command buttons

The command buttons can be selected using the Tab key and activated using the Enter key:

Install NOW
All the products displayed are installed one after another in the sequence in which they are listed. If a reboot is required to activate the installation, it is executed immediately after installation of the corresponding program. The system may, therefore, be rebooted several times until all products are installed.

Install at NEXT REBOOT
The screen above is displayed again the next time the system is rebooted. Nothing is installed immediately.

CANCEL Installing
Nothing is installed and the screen is not displayed again the next time the system
is rebooted. Later, other installations can then only be performed explicitly in
Windows mode by activating the setup.exe programs directly from the Setup
directories.

If you want to install individual products at a later stage, activate the HMI Explorer
via the SINUMERIK desktop. Then, in the HMI Explorer, select the product to be
installed under the "Install" menu item (see also the "SINUMERIK desktop"
section).

Errors during system ramp-up

The following errors can occur during ramp-up:

- Hard disk is still locked
  Remedy: Unlock hard disk
- PCU 50 does not ramp up,
  Remedy: See /BH/, Operator Components Manual

1.3.3 Boot virus check

SYSLOCK V2

The SYSLOCK program is used to detect basic boot sector and partition table
viruses. The fact that all viruses of this type have to be installed in a memory area
just below the 640 KB limit for technical reasons is utilized to full advantage. These
viruses then manipulate the BIOS so that it reduces the available memory and
displays it as 639 KB, for example.

The SYSLOCK driver uses this characteristic to detect a virus infection. In this way,
both previously defined viruses and those not yet identified by the usual virus
scanners can be detected.

The main advantage of SYSLOCK when compared to conventional antivirus
protection products is that the antivirus protection software does not have to be
updated regularly.

On the other hand, this means that the SYSLOCK driver cannot identify individual
viruses or disinfect a system affected by a virus.

This requires a full virus scanner product (e.g., Trend OfficeScan from Trend Micro,
Inc.).

Virus alarm

If the program detects that the size of the main memory has changed since the first initialization, a virus alarm and the following system responses are triggered:

- The program is paused for 30 seconds
- A message is displayed on the screen
- A message is logged in the file C:\SYSLOCK.LOG This file only exists if a virus alarm was recorded the last time SYSLOCK was started.

If a virus message is output, the system must be checked and disinfected using a full virus scanner. The conventional procedure should be used for disinfecting boot viruses:

1. Start the system from a clean, i.e., virus-free, boot diskette.
2. Open the virus scanner and disinfect the system.

Once the system has been successfully disinfected, SYSLOCK.EXE automatically recognizes it as being "clean".

1.3.4 Starting ramp-up using an HMI application

Valid for: PCU 50 with PCU basic software WinNT 4.0 V07.03.04 or higher

If an HMI application, e.g., HMI Advanced, is to be started following ramp-up, the settings and functionality differ from those that apply if the Windows desktop is to be started.

Starting an HMI application on ramp-up

When the HMI application is exited, Windows NT shuts down completely. Keystroke sequences and function keys that were pressed simultaneously are then filtered. The keystroke sequences and functions that were pressed simultaneously and are to be filtered, can be configured in file *E:\WinNT.40\System.ini*.

Filtering keystroke sequences:

Section:	MMC103Keyb
Key:	SeqAct
Value:	\<bit mask\>
	(= keystroke sequences to be filtered, specified in accordance with the comment in E:\WinNT.40\System.ini)
Init value:	262143

Filtering function keys that were pressed simultaneously:

Section:	MMC103Keyb
Key:	ConcurrentKeyMask
Value:	\<bit mask\>
	(= function keys to be filtered, specified in accordance with the comment in E:\WinNT.40\System.ini)
Init value:	255

Windows Explorer runs in the background and its settings (browser functionality, taskbar, start menu, etc.) prevents the Windows platform being accessed unintentionally.

Starting HMI desktop after ramp-up

Programs can be started at the same time as the HMI application and are started automatically by Windows when the HMI desktop is opened. This start in parallel to the HMI application can be configured.

Programs in Windows Startup directories in E:\WinNT.40\Profiles:

Key:	HKLM\SOFTWARE\Siemens\SINUMERIK\Basic software\ <version>\HMI Manager
Value:	StartSINHMIStartupDirsPrograms (DWORD)
Data:	1 (the programs are started) *or* 0 (the programs are NOT started)
Init data:	0
Default data:	0 (if entry is not available/readable):

Programs in the registry entries
"HKCU\Software\Microsoft\Windows\CurrentVersion\Run" and
"HKLM\Software\Microsoft\Windows\CurrentVersion\Run":

Key:	HKLM\SOFTWARE\Siemens\SINUMERIK\Basic software\ <version>\HMI Manager
Value:	StartSINHMIRunPrograms (DWORD)
Data:	1 (the programs are started) *or* 0 (the programs are NOT started)
Init data:	0
Default data:	0 (if entry is not available/readable)

1.3.5 Starting ramp-up using the HMI desktop

Valid for: PCU 50 with PCU basic software WinNT 4.0 V07.03.04 or higher

When an HMI application started from the HMI desktop is exited, you are returned to the HMI desktop. The keystroke sequences and function keys that are pressed simultaneously are filtered as a function of the configuration in file E:\WinNT.40\System.ini.

Filtering keystroke sequences:

Section:	MMC103Keyb
Key:	KeySequencesEnable
Value:	1 (= filtering of keystroke sequences specified in the SeqAct key) or 0 (= NO filtering)
Init value:	0
Default value:	0 (if entry is not available/readable):

Key:	SeqAct
Value:	<bit mask> (= keystroke sequences to be filtered, specified in accordance with the comment in E:\WinNT.40\System.ini)
Init value:	262143

Filtering function keys that were pressed simultaneously:

Section:	MMC103Keyb
Key:	ConcurrentKeyEnable
Value:	1 (= filtering of function keys specified in the ConcurrentKeyMask key) or
	0 (= NO filtering)
Init value:	1
Default value:	0 (if entry is not available/readable)
Key:	ConcurrentKeyMask
Value:	<bit mask>
	(= function keys to be filtered, specified in accordance with the comment in E:\WinNT.40\System.ini)
Init value:	255

The Windows platform is freely accessible from the HMI desktop. When the HMI desktop is started, all programs that standard Windows would start automatically on login are also started.

1.3.6 Storage location of HMI ramp-up screen

The Siemens ramp-up screens are stored under the path below on the appropriate PCU, e.g., for the SINUMERIK 840D controller:

`F:\hmi_adv\ib\DATA\0\<Resolution>\0_1.bmp`

A directory tree can also be created for manufacturer-specific ramp-up screens. The manufacturer's screens can then be saved in accordance with the schematic below:

Directory tree of manufacturer-specific ramp-up screens:

`F:\oem\ib\DATA\<NckType>\<Resolution>\<Name.bmp>`

NckType stands for:	Default		Resolution:	640	(dpi)
	0	(840D)		800	
	2000	(810D)		1024	
	3000	(802D)			
	5000	(840Di)			

If you want the same screen to be used each time (NCU-independent screen), it can be saved in the "default" directory in the required resolutions. If you want to be able to use different screens for different NCUs, they should be saved in the <NckType>\<Resolution> subdirectories using the appropriate resolution.

Screen name and resolution

<Name>.bmp : The name can be selected freely; only one file is permitted per directory. The screens must be created with a graphics tool in the resolution indicated by the subdirectory name and stored in the corresponding directory. The HMI software selects the screen, depending on the NCK type and the resolution of the available operator panel.

1.3.7 Displaying an in-house ramp-up screen or desktop background image

Valid for: PCU 50 with PCU basic software WinNT 4.0 V06.02.01 or higher

Displaying an in-house ramp-up screen

Set up a directory containing several ramp-up screens (for different panel resolutions). This directory should be segmented into subdirectories *640*, *800* and *1024*, which each contain a ramp-up screen of the appropriate resolution.

A directory containing default ramp-up screens can also be set up, likewise divided into subdirectories *640*, *800* and *1024*. The default ramp-up screen stored there for a particular resolution is displayed if no ramp-up screen (including one with a lower resolution) is found in the ramp-up-screen directory described above.

If no default ramp-up screen (including one with a lower resolution) is found, a general default ramp-up screen is displayed, which is part of the PCU basic software.

The paths of the directories mentioned must be set in the registry:

Directory containing ramp-up screens:

Key:	HKLM\SOFTWARE\Siemens\SINUMERIK\Basic software\ <version>\HMI Manager
Value:	BackgroundBitmapDir (STRING)
Data:	"<path>" (e.g., "E:\WinNT.40\System32\AppStartupBitmaps\1000\1") or "(None)" (= NO in-house ramp-up screens)
Init data:	"(None)"
Default data:	"(None)" (if entry is not available/readable)

Directory containing default ramp-up screens:

Key:	HKLM\SOFTWARE\Siemens\SINUMERIK\Basic software\ <version>\HMI Manager
Value:	DefaultBackgroundBitmapDir (STRING)
Data:	"<path>" (e.g., "E:\WinNT.40\System32\DefStartupBitmaps") or "(None)" (= NO default ramp-up screens)
Init data:	"(None)"
Default data:	"(None)" (if entry is not available/readable)

Changing the desktop background image

The background pattern and image on the Windows desktop must be set in the registry as shown below (instead of via the Control Panel [Settings -> Control Panel -> Display -> Background]):

Background pattern:

Key:	HKLM\SOFTWARE\Siemens\SINUMERIK\Basic software\ <version>\HMI desktop
Value:	Pattern (STRING)
Data:	"<bit code>" (e.g., "0 80 114 32 0 5 39 2", see HKCU\Control Panel\Patterns) "(None)" (= NO background pattern)
Init data:	Background pattern previously set via the Control Panel
Default data:	"(None)" (if entry is not available/readable)

Background image:

Key:	HKLM\SOFTWARE\Siemens\SINUMERIK\Basic software\<version>\HMI desktop
Value:	Bitmap (STRING)
Data:	"<path>" (e.g., "E:\WinNT.40\System32\Desktop.bmp") or "(StartupBitmap)" (the current ramp-up screen is also the background image) or "(None)" (= NO background image)
Init data:	Background image previously set via the Control Panel
Default data:	"(None)" (if entry is not available/readable)

Note

An attempt to set the Windows desktop background (as in standard Windows) via the Control Panel does not affect the desktop background display, but only the ramp-up screen display.

1.4 Configuring HMI users

Use

You can configure the nominated Windows user under which the HMI system software is always started (= HMI user). The local Windows user is the default HMI user "auduser".

Any other Windows user can also become the HMI user (instead of "auduser") if they are set up as a local Windows user or a domain user and possess administrator rights.

The registry entries below must be made in order to register as an HMI user:

Reference				Default
	Key	HKLM\SOFTWARE\Siemens\SINUMERIK\Basic software\<*version*>\ HMI Manager		
User		Entry	HMIUserName (STRING)	auduser
Domain		Entry	HMIUserDomainName (STRING)	local

For the HMIUserDomainName you should enter:

for a domain user:	"<*domainname*>"
for a local user:	"**(**local**)**"

If the user logs in as the (currently registered) HMI user, the HMI system software starts automatically on ramp-up. If the user logs in as the HMI user as another Windows user, they are taken to the SINUMERIK desktop.

Auto logon

The user does not usually have to log on explicitly, as the system is configured in such a way that the user is logged on as the HMI user automatically.

Should the user wish to log on as another Windows user, they have to hold down the **Shift key** on the PS2 keyboard or an external USB keyboard (not possible on the OP keyboard) once the ramp-up screen has appeared. The Windows **logon screen** then appears and the user has to enter the name and password of the desired Windows user.

■

2 Configuring a System

2

SINUMERIK 840D sl/840D/840Di/810D Commissioning Basic Software (IAM2) – 08/2005 Edition   IM6/2-25

2.1 Service menu functions (DOS function)

2.1.1 Service menu

The Service menu offers
- Functions for installing/updating the HMI system software
- Functions for data backup/restore (see Chapter 4)

Calling up the Service menu

1. When ramping up the system, select the **second**, hidden menu entry in the Boot Manager, below the "SINUMERIK" menu entry.
   The main menu for the Service menu opens.
2. Enter the password if required.
   The next page displays a menu overview.

The following functions are available in the **Service menu**:

Main menu					Function		
1					**Install/Update SINUMERIK system:** Installation and addition to or updating of the SINUMERIK system		
	1				Install from Floppy Disk		
	2				Install via Serial/Parallel Line: Serial connection/parallel connection		
	3				Install from Network Drive: Network connection		
		1			**Manage Network Drives**		
			1		Connect to Network Drives, enter connection data		
			2		Show connected Network Drives		
			3		Disconnect from all Network Drives		
			4		**Change Network Settings**		
				1	Change Machine Name (for DOS-Net only)		
				2	Change User Name		
				3	Toggle Protocol		
				4	Toggle logon to domain (Yes or No)		
				[5]	Change Domain Name		
				[6]	**Change TCP/IP settings**		
					1	Toggle "Get IP Addresses" (automatically/manually)
					2	Change IP Address
					3	Change Subnetmask
					4	Change Gateway
					5	Domain Name Server
					6	Change DNS Extension
					9	Back to previous menu
				9	Back to previous menu		
			9		Back to previous menu		
		4			Change Install Directory		
		[5]			Install from (network drive), if set up		
		9			Back to previous menu		
	5				REBOOT: Restart the system		
	9				Return to Main Menu: Back to main menu		

Main menu				Function
2				**SINUMERIK Tools and Options:** Load additional tools and enable options.
	1			Activate STEP7 for PCU (see note below)
	9			Return to Main Menu: Back to main menu
3				**DOS Shell:** Call the DOS command interpreter, drive C:\ is displayed, type "exit" to leave the DOS shell.
4				**Start Windows:** The Windows functions can be used here.
	1			Standard Windows (without starting SINUMERIK HMI)
	4			Original SINUMERIK HMI Environment, started on next ramp-up
	5			Current SINUMERIK HMI Environment, started on next ramp-up
	9			Return to Main Menu: Back to main menu
5				**SINUMERIK System Check:** Test the file system for consistency, restore consistency with SCANDISK if necessary.
7				**Backup/Restore:**
	1			Hard disk Backup/Restore with GHOST
		1		Configure GHOST Parameters: Set parameters (interface, path, network connection) for Norton Ghost
			1	Set Connection Mode PARALLEL (LPT:)
			2	Set Connection Mode LOCAL/NETWORK
			3	Change Backup Image File Name
			4	Change Restore Image File Name
			5	Change Machine Name (for Windows and DOS net)
				1 Input Machine Name MANUALLY
				2 Generate Machine Name RANDOMLY
				9 Back to previous Menu
			6	Manage Network Drives
			7	Change Split Mode
				1 NO Splitting
				2 Splitting
			9	Back to previous Menu
		2		Harddisk Backup: Back up hard disk
		3		Harddisk Restore: Restore the data backup of the hard disk
			1	Windows XP
				1 Standard Partitioning (default)
				2 User-defined Partitioning
				3 Image-defined Partitioning
			2	Windows NT/2000 (submenu same as for Windows XP)
			3	Windows 95 (submenu same as for Windows XP)
			4	WfW3.11 (submenu same as for Windows XP)
			5	DOS (spare part) (submenu same as for Windows XP)
			9	Back to previous Menu
		4		Switch to other version of GHOST
		9		Back to previous Menu: Return to previous menu

SINUMERIK 840D sl/840D/840Di/810D Commissioning Basic Software (IAM2) – 08/2005 Edition   IM6/2-27

Main menu		Function			
7	*4*	Partitions Backup/Restore with Ghost: Save content of partitions C:, E:, F: to D: or copy back from D: to C:, E:, F:.			
		1	Configure GHOST Parameters		
			1	Change Maximum Backup Images	
			2	Define Emergency Backup Image	
			9	Back to previous Menu	
		2	Partitions Backup, Mode LOCAL		
		3	Partitions Restore, Mode LOCAL		
		4	Partition E (Windows) Restore, Mode LOCAL		
		8	Delete Image		
		9	Back to previous Menu		
	9	Return to Main Menu: Back to main menu			
8		**Start PC Link:** install software from a CD-ROM (Interlink/Interserve)			
9		**Reboot:** Restart the system			

Parameterizing the Service menu

The points available in the Service menu can be parameterized as follows:
[a]   provide/suppress
[b]   observe special product designation (in place of SINUMERIK)
[c]   change text

File **envparam.bat** must be created in the **Tools** directory, partition **C:**, and filled with the commands below for parameterization purposes:

Entry no.		**DOS command**	Text/function, if = TRUE	Text/function, if = FALSE	Preassignment
1	[a]	**set _INSTALL**	1 Install/Update SINUMERIK System	Not displayed	TRUE
2	[a]	**set _TOOLS**	2 SINUMERIK Tools and Options	Not displayed	TRUE
4	[a]	**set _SERVICE**	4 Start Windows (Service Mode)	Not displayed	TRUE
6	[a]	**set _REBOOT**	6 Reboot System (Warmboot)	Not displayed	FALSE
	[a]	**set _HMI**	Display submenu with HMI functions	Not displayed	TRUE

String entries:

9	[c]	**set _ENDTXT**	=*String*		Reboot (Warmboot)
	[b]	**set _PRODUCTLINE**	=*String*		SINUMERIK

Calling the Recovery Console

When ramping up the system, select the **third**, hidden menu entry in the Boot Manager, below the "SINUMERIK" menu entry.

The system displays: Starting Windows Recovery Console.
Please refer to the original MS literature for more details.

2.1.2 Setting the original SINUMERIK HMI environment

The HMI environment is set to its original delivery condition. The content of the
following directories is saved prior to this:
- ADD_ON
- USER
- OEM
The directories are then cleared.

Operation

While the PCU is ramping up (after switching the controller off and then on again)

1. **Select the Service menu [hidden menu entry] in the Boot Manager**

The following menu is displayed:

```
              PLEASE SELECT

      1 Install/Update SINUMERIK System
      2 SINUMERIK Tools and Options
      3 DOS Shell
      4 Start Windows (Service Mode)
      5 SINUMERIK System Check
      7 Backup/Restore
      8 Start PC Link

      9 Reboot (Warmboot)

Your Choice [1, 2, 3, 4, 5, 7, 8, 9]?
```

2. **Select option 4**

The following menu is displayed:

```
              PLEASE SELECT

      1 Standard Windows (without starting SINUMERIK HMI)
      4 Original SINUMERIK HMI environment
      5 Current SINUMERIK HMI environment

      9 Return to Main Menu

Your Choice [1, 4, 5, 9]?
```

Setting the environment

3. **Select option 4**

The system will ask you to enter the password:

```
passwd:
```

4. Enter one of the passwords for authorization levels 0 – 2.
   - System
   - Manufacturer
   - Service

Booting

The system will then reboot automatically.
The function is actually executed next time Windows is ramped up, before the HMI system software is started.

Note

The HMI environment can also be set to its original delivery condition by starting the "Original SINUMERIK HMI Environ" function from the SINUMERIK desktop.

2.1.3 Setting the current SINUMERIK HMI environment

The original HMI environment setting is undone, that is, the contents of the saved directories are reloaded.

Operation

While the PCU is ramping up (after switching the controller off and then on again)

1. Select the Service menu [hidden menu entry] in the Boot Manager

The following menu is displayed:

```
         PLEASE SELECT

         1 Install/Update SINUMERIK System
         2 SINUMERIK Tools and Options
         3 DOS Shell
         4 Start Windows (Service Mode)
         5 SINUMERIK System Check
         7 Backup/Restore
         8 Start PC Link

         9 Reboot (Warmboot)

Your Choice [1, 2, 3, 4, 5, 7, 8, 9]?
```

2. Select option 4

The following menu is displayed:

```
                PLEASE SELECT

        1 Standard Windows (without starting SINUMERIK HMI)
        4 Original SINUMERIK HMI environment
        5 Current SINUMERIK HMI environment

        9 Return to Main Menu

Your Choice [1, 4, 5, 9]?
```

Setting the environment

3. Select option 5

The system will ask you to enter the password:

```
passwd:
```

4. Enter one of the passwords for authorization levels 0 – 2.
- System
- Manufacturer
- Service

Booting

The system will then reboot automatically.

The function is actually executed next time Windows is ramped up, before the HMI software is started.

Note

The original HMI environment setting can also be undone by starting the "Current SINUMERIK HMI Environ" function from the SINUMERIK desktop.

2.1.4 Starting DOS shell

Operation

While the PCU is ramping up (after switching the controller off and then on again)

1. Select the Service menu [hidden menu entry] in the Boot Manager

The following menu is displayed:

```
              PLEASE SELECT

      1 Install/Update SINUMERIK System
      2 SINUMERIK Tools and Options
      3 DOS Shell
      4 Start Windows (Service Mode)
      5 SINUMERIK System Check
      7 Backup/Restore
      8 Start PC Link

      9 Reboot (Warmboot)

Your Choice [1, 2, 3, 4, 5, 7, 8, 9]?
```

Starting DOS shell

2. Select option 3

The system will ask you to enter the password:

```
passwd:
```

3. Enter one of the passwords for authorization levels 0 – 2.
   - System
   - Manufacturer
   - Service
You are now in the DOS shell.

Exiting DOS shell

To leave the DOS shell, type *exit*.

2.1.5 Starting the SINUMERIK desktop

On the next ramp-up, the SINUMERIK desktop (Windows) will start instead of the HMI system software.

Operation

While the PCU is ramping up (after switching the controller off and then on again)

1. Select the Service menu [hidden menu entry] in the Boot Manager

The following menu is displayed:

```
          PLEASE SELECT

          1 Install/Update SINUMERIK System
          2 SINUMERIK Tools and Options
          3 DOS Shell
          4 Start Windows (Service Mode)
          5 SINUMERIK System Check
          7 Backup/Restore
          8 Start PC Link

          9 Reboot (Warmboot)

Your Choice [1, 2, 3, 4, 5, 7, 8, 9]?
```

Starting DOS shell

2. Select option 4

The following menu appears:

```
          PLEASE SELECT

          1 Standard Windows (without starting
                              SINUMERIK HMI)
          4 Original SINUMERIK HMI environment
          5 Current SINUMERIK HMI environment

          9 Return to Main Menu

Your Choice [1, 4, 5, 9]?
```

Starting the SINUMERIK desktop

3. Select option 1

Booting

The system will then reboot automatically.
The SINUMERIK desktop (Windows) is started instead of the HMI system software.

> **Note**
>
> The SINUMERIK desktop can also be started by pressing key "3" (within a
> 3-second time window) when the PCU basic software version data appears on
> the background image during ramp-up.

2.1.6 Checking the hard disk

All partitions (C:, D:, E:, F:) on the hard disk are checked.

Operation

While the PCU is ramping up (after switching the controller off and then on again)

1. Select the Service menu [hidden menu entry] in the Boot Manager

The following menu is displayed:

```
            PLEASE SELECT

   1 Install/Update SINUMERIK System
   2 SINUMERIK Tools and Options
   3 DOS Shell
   4 Start Windows (Service Mode)
   5 SINUMERIK System Check
   7 Backup/Restore
   8 Start PC Link

   9 Reboot (Warmboot)

Your Choice [1, 2, 3, 4, 5, 7, 8, 9]?
```

Checking the hard disk

2. Select option 5

Booting

The system will then reboot automatically.

The function is actually executed next time Windows NT/XP is ramped up, before
the HMI system software is started.

> **Note**
>
> The hard disk can also be checked on the SINUMERIK desktop by starting the
> function "Check SINUMERIK System".

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2.1.7 Checking the PCU basic software version

The versions of the Service menu system components contained in the PCU basic software and those of Windows NT/XP are listed in file *C:\BaseVers.txt.*

Alternatively, HMI Explorer can be activated on the SINUMERIK desktop.

Operation

1. Proceed as described in the "Starting DOS shell" section.

2. Enter: type BaseVers.txt

   The version information is listed.
   To leave the DOS shell, type *exit*.

Result

The PCU basic software version is displayed on the bottom right of the ramp-up screen.

2.2 SINUMERIK desktop functions (Windows)

2.2.1 Saving HMI desktop settings

Valid for: PCU 50 with PCU basic software WinNT 4.0 V06.01.07 or higher

Default setting

Settings made on the HMI desktop (e.g., arrangement of icons on the HMI desktop) are not saved as standard when logging off. In other words, a service engineer should not find that any changes have been made to the HMI desktop, which could have been caused by another service engineer during a previous session.

Saving settings

This behavior can be changed by making an entry in the registry.
This registry entry determines whether the following settings are saved or not:
- Moving and deleting of icons
- Positions of open windows
- Size and position of the taskbar

Links on the HMI desktop are always saved, irrespective of the registry entry.

Note

Application windows, which are still open prior to logging off, should be closed before exiting the HMI desktop if "Saving settings" is active. Otherwise, they would appear for a short period (via an Explorer running in the background) when the system is rebooted (directly before the HMI application is started), which could have a disruptive effect.

Saving the HMI desktop settings:

Key:	HKLM\SOFTWARE\Siemens\SINUMERIK\Basic software\ <version>\HMI Manager
Value:	SaveSINDesktopSettings (DWORD)
Data:	1 (HMI desktop settings are saved) or
	0 (HMI desktop settings are NOT saved)
Init data:	- Value is not created by the basic software -
Default data:	(If entry is not available/readable): 0

The key is effective for all HMI and other users.

2.2.2 Installing system software or an update

Installation path

System software or a software update can be installed using the SINUMERIK desktop, as well as the Service menu (DOS). This mostly affects installation/update packages, which have been transferred to the PCU via the Windows network.

Installation can be performed in two ways:

- The installation/update process can be started from the SINUMERIK desktop directly by executing the installation/update package.

- The installation/update package is stored in directory *D:\INSTALL.* The installation/update process is started automatically during ramp-up when the PCU is next booted. Only when the installation or update process is completed does normal system ramp-up continue and, if necessary, HMI software started.

Automatic execution

Several installation directories can be set to enable a user setup to be executed automatically. Installation directories are the "Install" subdirectories, which are listed in the SetupDirs section of the E:\Windows\System32\HMIServe.ini parameters file.

The "D:\Install" installation directory is preset there.
The key names contained within a section of the
E:\Windows\System32\HMIServe.ini parameters file must be unique.

Note

Prior to automatic execution of setups from the installation directories (e.g.,
D:\Install), a checkback screen is always displayed and must be acknowledged
manually.

Remedy:
A value can be configured in the registry to set whether the checkback screen
should be displayed or not.
Path in the registry: 'HKLM\SOFTWARE\Siemens\SINUMERIK\Basic software\
<version>\HMI Manager\ShowInstallStartDialog'

ShowInstallStartDialog
      = 0: Screen is not displayed (default setting)
      = 1: Screen is displayed

The installation directories are evaluated in the sequence described in the
parameters file. If the parameters file is missing or if it does not contain a
"SetupDirs" section, the preset "D:\Install" installation directory is considered
instead. If the "SetupDirs" section does contain installation directories, but not
"D:\Install", the "D:\Install" directory is not considered within the context of the set
installation directories.

When executing a setup using OpFile, whether or not the setup requires a reboot
once it has been completed is taken into account and displayed via a
corresponding OpFile entry. If a corresponding entry exists, a reboot is triggered. If
there is a chain of setups to be executed one after the other, the reboot is
performed once the final setup is complete.

Note

Installing the HMI system software or an update using the Service menu (DOS) is
described in Section 3.3.

2.2.3 Setting the original SINUMERIK HMI environment

The "Original SINUMERIK HMI Environ" function is available as a script file on the
SINUMERIK desktop. The original delivery condition is set up, i.e., the contents of
the directories below are saved, when this function is executed:

- F:\ADD_ON
- F:\USER
- F:\OEM
- C:\RUNOEM

The directories are then cleared.

Note

The function can also be triggered from the Service menu (DOS).
It is then executed during the Windows NT ramp-up (before the HMI system
software is started), without displaying the SINUMERIK desktop.

2.2.4 Setting the current SINUMERIK HMI environment

The "Current SINUMERIK HMI Environ" function is available as a script file on the
SINUMERIK desktop. When this function is executed, restoration of the original
settings is canceled, i.e., the saved directory contents are copied back.

Note

The function can also be triggered from the Service menu (DOS).
It is then executed during the Windows ramp-up (before the HMI system software
is started), without displaying the SINUMERIK desktop.

2.2.5 HMI Explorer functions

There is (sometimes) an option to start and uninstall individual HMI applications
from the HMI Explorer.

Displaying component information

The component information of a product is displayed in the Component dialog box.
Selecting the "Component" option in the Export Settings allows component
information to be printed or saved.

The current internal version is displayed in the Info dialog box; the internal versions
of the Release, Service Pack and Hotfix are displayed in the History dialog box.
This information is also saved and printed if the Info and History tabs are selected
in the Export Settings.

2.2.6 Error analysis

Checking the hard disk

The "Check SINUMERIK System" function is available as a script file on the
SINUMERIK desktop. All partitions (C:, D:, E:, F:) on the hard disk are checked
when this function is executed.

Note

The function can also be triggered from the Service menu (DOS). It is then
executed during the Windows ramp-up (before the HMI system software is
started), without displaying the SINUMERIK desktop.

Generating dump information

Windows NT/XP is configured such that if a system crash (blue screen) occurs, Windows generates a dump containing current system information. The dump is stored in the file *D:\Memory.dmp*.

Checking versions of the HMI system software

The "HMI Explorer" Windows program is available on the SINUMERIK desktop. When this program is called, detailed version information relating to the HMI system software applications installed and to Windows NT/XP is displayed.

Log file

Whenever the system is ramped up, information is written to a block in the file D:\$$Base.log, which contains the date, time and nature of administrative interventions.

Information about the ramp-up, controlled by the HMI Manager, can be displayed on the screen and written to log file D:\$$Base.log.

Output is controlled via registry values:

- The **type of information** to be output is set via registry value "HKLM\SOFTWARE\Siemens\SINUMERIK\Basic software\<version>\HMI Manager\InfoLevel":

  InfoLevel (DWORD)

  > = 1: Mandatory information is output (default setting)

  > = 2: Mandatory and supplementary information is output

  > = 3: Mandatory, supplementary and trace information is output
  > (*InfoLevel <= 0* treated as *InfoLevel == 1*, *InfoLevel > 3* treated as *Info Level == 3*)

- Whether **the information** is also to be **displayed on the screen** (as well as being output to the log file) is set via registry value "HKLM\SOFTWARE\Siemens\SINUMERIK\Basic software\<version>\HMI Manager\ShowInfo":

  ShowInfo (DWORD)

  > = 0: Only mandatory information is displayed, not supplementary or trace information

  > = 1: Mandatory, supplementary and trace information is displayed
  > (default setting)

2.2.7 Starting OEM programs

You can start OEM programs directly before starting the HMI system software. This requires these programs (or links to them) to be stored in subdirectories of the directory *C:\RunOEM*.

Starting OEM programs

The subdirectories are executed in the order listed. The programs within a subdirectory are started in the chronological order in which they were placed in the subdirectory.

- Programs in the *C:\RunOEM\SeqOnce* subdirectory are started **once** and **sequentially**, i.e., a program is not started until the previously started program is completed.

- Programs in the *C:\RunOEM\Seq* subdirectory are started **sequentially whenever the system is ramped up**, i.e., a program is not started until the previously started program is completed.

- Programs in the *C:\RunOEM\ParOnce* subdirectory are started **once** and **simultaneously**. They run in parallel with the HMI system software.

- Programs in the *C:\RunOEM\Par* subdirectory are started **simultaneously whenever the system is ramped up**. They run in parallel with the HMI system software.

Not only program files, but also other types of file can be stored in the subdirectories, which are then opened in accordance with their file type. For example, "*.txt*" files are opened using Notepad, "*.htm*" files are opened using Internet Explorer.

Information about the current software version

The SIEMENSD or SIEMENSE documents on the SINUMERIK desktop contain explanations, notes and supplementary conditions relating to the currently loaded PCU basic software.

2.3 PCU 50/70 with SITOP UPS module

Application

If the supply voltage to the PCU 50/70 dips, the SITOP UPS modules below could maintain operation for a limited period if a backup battery is being used, allowing the HMI to be properly shut down before the battery is exhausted:

6EP1931-2DC31	6 A module with serial interface or
6EP1931-2EC31	15 A module with serial interface or
6EP1931-2DC41	6 A module with USB interface or
6EP1931-2EC41	15 A module with USB interface

Note

The UPS modules with USB interfaces can only be used on a PCU 50 with WinXP PCU basic software.

Requirements

- PCU 50, V2 or higher
- Windows XP PCU basic software, V07.03.02 or higher or
  Windows NT 4.0 PCU basic software, V 07.03.04 or higher for serial interfaces
- Windows XP PCU basic software, V07.04.00 or higher for USB interfaces
- HMI Advanced, V06.03.14 or higher
- SITOP software, V2.5.2.4 or higher is installed:
  SITOP software is available for download from:
  http://www.ad.siemens.com/sitop
- SITOP monitor/configuration program is installed:

  To enable this, the SITOP software must be copied to the E:\SITOP directory set up on the PCU 50. This directory already contains PCU 50 tools required for shutdown on the SITOP UPS. If this directory does not exist in an older version of the PCU basic software, it must be created so that it will be compatible for any subsequent updating of the PCU basic software.
- UPS USB driver for Windows XP is installed:

  Installation is described in the relevant SITOP documentation. The documentation is part of the SITOP software download package.
- The SITOP UPS hardware is connected.

Note

The "SITOP UPS" function has been tested in the standard configuration of HMI Advanced. When installing add-on or OEM software components, the shutdown procedure of the complete system has to be checked by the user.

2.3.1 Starting and configuring the SITOP monitor

1. The SITOP monitor has to be started by Windows automatically during ramp-up. A new value has to be entered for the SITOP monitor under the key below in the Windows registry:
   [HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Run]
   ValueName: SITOP
   ValueType: REG_SZ
   Value Data: E:\SITOP\SITOP_DC_UPS.exe

2. An XP script file, sitop.reg, is located in the E:\SITOP directory. The required key is entered into the XP registry automatically if this file is executed.

3. The SITOP monitor is started automatically once the PCU 50 is restarted. The next installation step is to configure the monitor.

Notice

The SITOP monitor must not be started via the Windows Autostart directory.

General settings

The following settings must be made in the SITOP-monitor configuration dialog box:

- Parameterization of the interface:
  COM2 for a module with a serial interface
  USB for a module with a USB interface
- Parameterization of the change action:
  The monitoring window display must be deselected, as this function can lead to sporadic faults on the HMI user interface.

Parameterization of the SITOP monitor

Enter the path of the program that ensures that HMI Advanced and the PCU shut down properly in the event of a power failure into the parameter area of the buffer.
E:\SITOP\Shutdown.bat

Alternatively, the following settings should be used for XP 07.03 or NT 07.03.04 PCU basic software:

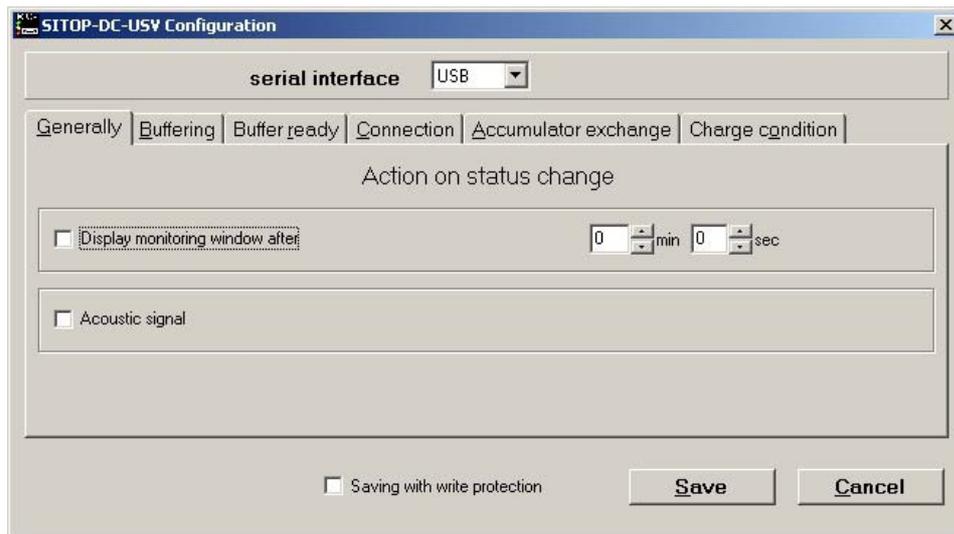|	
Path for XP:	E:\Windows\system32\hmiexit.exe
Path for NT 4.0:	E:\WINNT.40\System32\hmiexit.exe

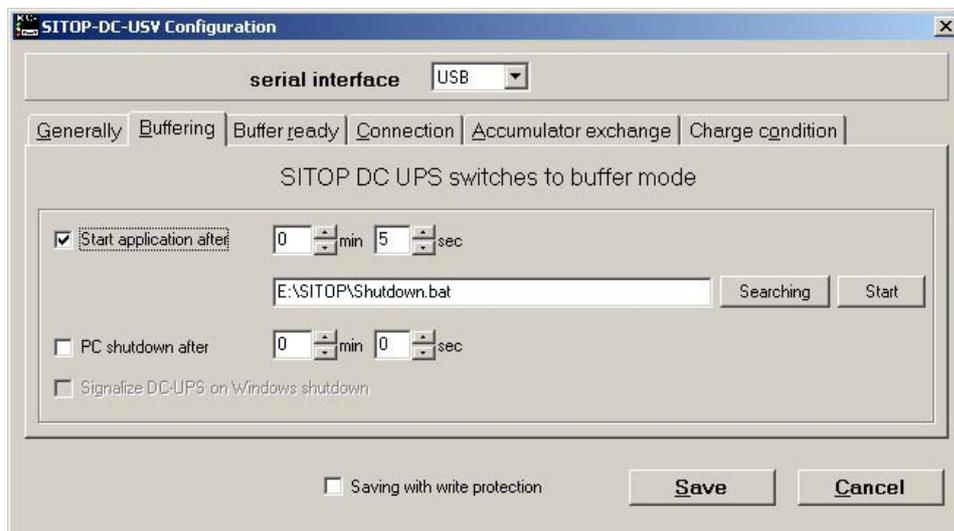Fig. 2-1   Configuration of the SITOP monitor: General settings

Fig. 2-2   Configuration of the SITOP monitor: Buffering settings

2.3.2 Configuration of SITOP UPS module

Buffering parameterization

> The UPS module can be used to select whether buffering should be completed after a predetermined period of time or not until the accumulator's exhaustive discharge threshold (= maximum buffer time) has been reached. Both buffering parameterizations result from this.

"Maximum buffer time" mode
(XP 07.04.00 or NT 07.03.06 PCU basic software or higher)

> This mode enables the system to be shut down in a time-optimized manner. The UPS module is synchronized with the shutdown of the operating system. Buffering is maintained until the operating system has been shut down.

The operating system must shut down within a maximum of five minutes (including all applications). Otherwise, the UPS module buffers for the maximum buffer time (dependent on the accumulator state).

Required settings on the UPS module (USB interface)

On - Off

+2 V	Cut-in threshold
+1 V	Cut-in threshold
+0.5 V	+22 V fixed
+1 V	
+1 V	
+0.5 V	End-of-charge voltage
+0.2 V	End-of-charge voltage
+0.2 V	+26.3 V fixed
+0.1 V	
0.35 A/0.7 A	Charging current
Set time/max. time	
+320 s	
+160 s	
+ 80 s	Buffer time
+ 40 s	
+ 20 s	
+ 10 s	+5 s fixed
Disconnection	
Accumulator operating state on/off	

○ Default setting, delivery condition

● Required setting for operation on the PCU 50

Required settings on the UPS module (serial interface)

On - Off

+2 V	Cut-in threshold
+1 V	Cut-in threshold
+0.5 V	+22 V fixed
+1 V	
+1 V	
+0.5 V	End-of-charge voltage
+0.2 V	End-of-charge voltage
+0.2 V	+26.3 V fixed
+0.1 V	
0.35 A/0.7 A	Charging current
Set time/max. time	
+320 s	
+160 s	
+80 s	Buffer time
+40 s	
+20 s	
+10 s	+5 s fixed
Disconnection	
Accumulator operating state on/off	

○ Default setting, delivery condition
● Required setting for operation on the PCU 50

"Fixed buffer time" mode

In this mode, the UPS module always buffers for the preselected, fixed period of time. It is not possible to synchronize the UPS module with the operating system shutdown.

Required settings on the UPS module

On – Off

+2 V	Cut-in threshold
+1 V	Cut-in threshold
+0.5 V	+22 V fixed
+1 V	
+1 V	
+0.5 V	End-of-charge voltage
+0.2 V	End-of-charge voltage
+0.2 V	+26.3 V fixed
+0.1 V	
0.35 A/0.7 A	Charging current
Set time/max. time	
+320 s	
+160 s	
+ 80 s	Buffer time
+ 40 s	
+ 20 s	
+ 10 s	+5 s fixed
Disconnection	
Accumulator operating state on/off	

○ Default setting, delivery condition

● Required setting for operation on the PCU 50

2.3.3 Configuration for exiting the HMI

HMI monitoring

Exiting of the HMI applications is monitored by a separate application, hmiexit.exe. This application is started implicitly via the shutdown.bat batch file. In case of error, the application forces the operating system to shut down. An error occurs if the HMI cannot be exited within the configured delay.

Optionally, the parameters below can be set for hmiexit in file:
E:\SITOP\hmiexit.ini.

[Actions]
#delay in seconds for exiting HMI Advanced applications
Wait = 120
#action after delay has expired
ForceShutdown = True

These default settings only need to be changed if it takes longer than 120 seconds to exit the HMI applications in an OEM installation. This configuration is not usually changed.

Configuring the EXIT button

During production, the option to shut down the HMI via the EXIT button in the operating area menu should be disabled, as this function cannot be synchronized with the UPS module. The EXIT button is disabled by entering ExitButton=False in the Regie.ini file.

Hibernate

The operating system's hibernate mode is suspended when operating the UPS, as the USB interface always has to be active for the UPS module.

References: //For more notes, please see the product descriptions using the corresponding order numbers.

■

3 Installing Software and Network Operation

3

Overview

This chapter describes how to install or update additional software based on the preinstalled WinNT/WinXP PCU basic software.

The description below is based on the delivery condition of the hardware and software components. The Service menu and the SINUMERIK desktop are both important tools.

3.1 Installing software and software update

Valid for:
PCU 50 with PCU basic software WinNT 4.0 V06.03.06 or higher and V07.03.05 or higher

3.1.1 Installing an upgrade or Service Pack

Upgrades and Service Packs for the WinNT 4.0 PCU basic software are provided in two ways:

- *Setup directory:*
  All files required for the installation, including Setup.exe, cab files, Setup.ini, etc., are stored together in one directory. The installation is started by starting Setup.exe.

- *Self-extracting setup:*
  First, when started, Setup.exe extracts itself to a temporary setup directory and then starts the installation by starting Setup.exe, which is stored there.

Upgrades and Service Packs can be processed in two ways, irrespective of how they are provided:

- *Independent setup:*
  The entire installation is controlled by the setup itself. In particular, setup is responsible for executing any necessary reboots during and/or after installation.

  The behavior of the setup is controlled via the Setup.ini control file. This is contained in the (temporary) setup directory as standard. The control parameters are set for interactive installation as standard.
  When setup finds the control file in the (temporary) setup directory, it is evaluated.

- *Subsetup of a frame setup:*
  Setup is started from a frame setup and, as such, does not have full control over the installation procedure. Instead, it reports state changes and results, such as success/failure, completion, cancellation, or any necessary reboots during and/or after installation, to the frame setup. The frame setup is then responsible for carrying out the appropriate measures.

  The behavior of the setup is controlled via the OpFile.txt control file. This is contained in the (temporary) setup directory as standard. The control parameters are set for silent installation as standard.

  Setup only evaluates the control file when call parameter -OF is entered when the file is called, e.g., Setup.exe -OF:.\OpFile.txt. In this case, the control file can be stored in any directory.

Note

There must not be any blank between *-OF:* and *.\OpFile.txt*.

The *-OF* call parameter lets setup know that it is running as the subsetup of a frame setup. In this case, before setup is completed, it stores information about other measures to be carried out by the frame setup in the result parameters of the control file, e.g.:

[RESULTS]
SetupSucceeded=1
RebootRequested=1

The frame setup is then responsible for carrying out the reboot.

Note

When calling a setup with call parameter -OF from the command line, the user is responsible for any necessary measures to be carried out after completion, e.g., a reboot.

3.1.2 "Silently" installing an upgrade or Service Pack

Valid for: PCU 50 with PCU basic software WinNT 4.0 upgrade V06.02.01

Independent or self-extracting setup

The relevant control parameters in the *Setup.ini* control file of the *Setup.exe* setup are already set for "silent" installation as standard, i.e.:

[Startup]
ShowUserDlg = no:
No user dialog boxes, such as welcome or license dialog boxes, are displayed.
ShowRebootDlg = no:
The end dialog box (Reboot yes/no) is not displayed.

Nevertheless, when these control parameters are set in this way, a dialog box appears during the installation process to ask whether the MPI needs to be reinstalled if the same MPI version is found. The only way to prevent this dialog box appearing is to use the *NagsAway.exe* tool to poll it and acknowledge it automatically as soon as it appears.

NagsAway.exe should be started before *Setup.exe* is called. It requires the *NagsAway.ini* configuration file, which is stored in the same directory as *NagsAway.exe* and contains the following:

[General]
Interval=100
[1]
WindowCaption=... checking installed MPI version
ControlCaption=&Yes
WinSubCheck=0
CtlSubCheck=0

Valid for:
PCU 50 with PCU basic software WinNT 4.0 upgrade V06.03.06 and
PCU 50 with PCU basic software WinNT 4.0 upgrade V07.03.05

Independent setup

The control parameters in the *Setup.ini* file of the *Setup.exe* setup are set for interactive installation. For "silent" installation, the following settings must be made:

[Startup]
ShowUserDlg = no:
No user dialog boxes, such as welcome or license dialog boxes, are displayed.
ShowRebootDlg = no:
The end dialog box (Reboot yes/no) is not displayed.

Self-extracting setup

The only way to prevent the end dialog box (Reboot yes/no) appearing is to use the *NagsAway.exe* tool to poll it and acknowledge it automatically as soon as it appears.

NagsAway.exe should be started before *Setup.exe* is called. It requires the *NagsAway.ini* configuration file, which is stored in the same directory as *NagsAway.exe* and contains the following:

[General]
Interval=100
[1]
WindowCaption=Setup Complete
ControlCaption=Yes, I want to restart my computer now.
WinSubCheck=0
CtlSubCheck=0
[2]
WindowCaption=Setup Complete
ControlCaption=Finish
WinSubCheck=0
CtlSubCheck=0

Subsetup of a frame setup

The *OpFile.txt* control file is also stored in the setup directory along with *Setup.exe.* The relevant control parameter in the *OpFile.txt* control file of the setup directory is already set for silent installation as standard:

[SETUPREQUESTS]
SetupMode = Batch

Assuming that *Setup.exe* is stored in the directory with path *<setuppath>*, start setup using:
<setuppath>\Setup.exe –OF:<setuppath>\OpFile.txt

Note

There must not be any blank between -*OF:* and .*OpFile.txt*.

Self-extracting setup

Control file *OpFile.txt* is among the installation files extracted by *Setup.exe.*
The relevant control parameter in the *OpFile.txt* control file is already set for silent installation as standard, i.e.:

[SETUPREQUESTS]
SetupMode = Batch

Assuming that *Setup.exe* is stored in the directory with path *<setuppath>*, start the self-extracting setup using:
<setuppath>\Setup.exe –s –a –OF:.\OpFile.txt

3.1.3 Installation with FAT16 data file structure

Requirements

You will need a PC or a PG with a CD-ROM drive.
INTERSVR is used on the external PG/PC to transfer the software to the PCU. It can only be operated under DOS/Win3.11/Win95/Win98 if the PG/PC has a hard disk partition with a FAT16 data file structure (not FAT32!).

Transfer

This function transfers the HMI software to be installed to D:\INSTALL. The actual installation is carried out by Windows NT on the next ramp-up, provided the software includes an exe file, e.g., "setup.exe".

The **parallel** (not serial) interface for the HMI software installation must be used for the transfer.

!   **Important**

Prior to the installation process, ensure that hard-disk partition D has sufficient free memory space.

Operation

1. Switch off the PCU.
2. Using the parallel connecting cable (PC-Link cable, LapLink cable), connect the parallel port LPT on the PG/PC to port LPT on the PCU.

Transmission mode	PC/PG	PCU
Parallel	LPT1	LPT (25-pin)

3. Copy the HMI Advanced directory from the CD to drive C:\ on your PG/PC's hard disk and rename it "MMC2". If there is insufficient memory space available on drive C:\ or it does not have a FAT16 data file structure, you can also use another local hard disk drive (e.g., D:\). The software cannot be installed directly from the CD.

4. Start the installation of the HMI software by calling the Windows Start menu, followed by Run..., and enter "Intersvr C:" (or the name of the drive on which the MMC2 directory is stored).
   IMPORTANT: With the PC/PG in this state, the PCU MUST be switched off (if the PCU is still switched on, switch it off now).
5. SWITCH ON the PCU and select "Service menu" in the Boot Manager (hidden menu entry).

The following menu is displayed:

```
            PLEASE SELECT:


            1 Install/Update SINUMERIK System
            2 SINUMERIK Tools and Options
            3 DOS Shell
            4 Start Windows (Service Mode)
            5 SINUMERIK System Check
            7 Backup/Restore
            8 Start PC Link


            9 Reboot (Warmboot)

Your Choice [1, 2, 3, 4, 5, 7, 8, 9]?
```

6. Select option 1

The system will ask you to enter the password:

```
passwd:
```

Enter one of the passwords for authorization levels 0 – 2.
- System
- Manufacturer
- Service

The following menu is displayed:

```
            PLEASE SELECT MEDIUM:

            1 Install from Floppy Disk
            2 Install via Serial/Parallel Line
            3 Install from Network Drive

            5 REBOOT

            9 Return to Main Menu

      Your Choice [1,2,3,5,9]?
```

7. **Select menu option 2** Install via Serial/Parallel Line.
8. The data transfer begins. The system boots Windows and the installation is started automatically.
9. Depending on the installation concept for the package to be loaded, follow the package-specific prompts until the installation is complete.
10. The PCU is rebooted once the installation is complete.
11. End PC/PG server mode by pressing Alt + F4.

3.1.4 Installation with FAT32 data file structure

General procedure

This function transfers the HMI software to be installed to D:\INSTALL. The actual installation is carried out by Windows on the next ramp-up, provided the software includes an exe file, e.g., "setup.exe".

! **Important**

Prior to the installation process, ensure that hard-disk partition D has sufficient free memory space.

Requirements

You will need a PC or a PG with a CD-ROM drive. You will also need a full keyboard on the PCU. The supplied CD-ROM containing the system software is also required for installation.

This method must be used if your PC/PG only has partitions with a FAT32 data file structure.

Transfer

The parallel (not serial) interface for the HMI software installation must be used for the transfer.

Operation

1. Copy INTERLNK.EXE from the HMI directory on the CD to WINDOWS\COMMAND on the PC/PG. Insert the following line in CONFIG.SYS:
   device=c:\windows\command\interlnk.exe /AUTO
2. Switch off the PCU.
3. Using the parallel connecting cable (PC-Link cable, LapLink cable), connect the parallel port LPT on the PC to port LPT on the PCU.
4. SWITCH ON the PCU
   Select "**Service menu**" in the Boot Manager [hidden menu entry].

```
        PLEASE SELECT:

        1 Install/Update SINUMERIK System
        2 SINUMERIK Tools and Options
        3 DOS Shell
        4 Start Windows (Service Mode)
        5 SINUMERIK System Check
        7 Backup/Restore
        8 Start PC Link

        9 Reboot (Warmboot)

Your Choice [1, 2, 3, 4, 5, 7, 8, 9]?
```

5. Select option 8
   The system will ask you to enter the password:

passwd:

6. Enter one of the passwords for authorization levels 0 - 2.
   - System
   - Manufacturer
   - Service
7. Now copy the entire contents of the HMI_Advanced directory on the CD to the D:\INSTALL directory on the PCU. On completion of the transfer, close INTERSVR on the PCU by pressing Alt + F4. The system boots to Windows.
8. With Windows NT/XP: The installation now proceeds automatically with the PCU's InstallShield. You can operate the InstallShield prompt boxes with TAB and the cursor keys (TAB corresponds to the END key on the OP0xx).
9. The system starts up after the PCU has rebooted.

3.1.5 Installation via a network connection

General procedure

This function transfers the HMI software to be installed to D:\INSTALL on the PCU. The actual installation is carried out by Windows on the next ramp-up, provided the software includes an exe file, e.g., "setup.exe".

!   **Important**

Prior to the installation process, ensure that hard-disk partition D has sufficient free memory space.

Note

If you are using a different language version of the Windows system, the terms used in the following setting operations may be different. The sequence of operations as specified below, however, is always the same.

Operation

While the PCU is ramping up (after switching the controller off and then on again):

1. Select the "Service menu" [hidden menu entry] in the Boot Manager.

The following menu is displayed:

```
PLEASE SELECT:

1 Install/Update SINUMERIK System
2 SINUMERIK Tools and Options
3 DOS Shell
4 Start Windows (Service Mode)
5 SINUMERIK System Check
7 Backup/Restore
8 Start PC Link
9 Reboot (Warmboot)

Your Choice [1,2,3,4,5,7,8,9]?
```

2. Select option 1.

The system will ask you to enter the password:

```
passwd:
```

- System
- Manufacturer
- Service

The following menu is displayed:

```
PLEASE SELECT MEDIUM:
1 Install from Floppy Disk
2 Install via Serial/Parallel Line
3 Install from Network Drive

5 REBOOT

9 Return to Main Menu

Your Choice [1,2,3,5,9]?
```

3. Select option 3.

An input screen is displayed in which you can specify settings for the network if necessary.

Connect to network drive

```
PLEASE SELECT
        1 Manage Network Drives

        4 Change Install Directory

        9 Back to previous Menu

Your choice [1, 4, 9]:?
```

4. **Select option 1** to specify the settings for a network connection. A screenform containing the detailed network functions is opened.

```
PLEASE SELECT
            1 Connect to Network Drives
            2 Show connected Network Drives
            3 Disconnect from all Network Drives
            4 Change Network Settings

            9 Back to previous Menu

Your choice [1, 2, 3, 4, 9]:?
```

5. **Select option 1.**

```
Type your password:
```

6. **Enter password**
   Enter the password permitting the user to retrieve the software from the shared directory on the networked PG/PC. (For setting the user, see Subsection 7.2.2.)

   PG/PC with Windows NT/XP:
   Password of a local user on the PG/PC

   ```
   Letter for Network Drive:
   ```

   Enter the letter of the PCU drive from which the connection must be accessed (e.g., "G")

   ```
   Directory to be mounted (e.g. r4711dir66):
   ```

   Enter the computer name of the PG/PC and the name of the directory (share name) that you wish to access.

   A screenform opens containing data for the PG/PC connection:

```
Machine Name                 : PCU_1_Name
User Name                    : auduser
Transport Protocol           : NETBEUI
Logon to domain              : No
Connect Network Drive (last):   G: (\\r3344\HMINEW)

PLEASE SELECT
            1 Connect to Network Drive
            2 Show connected Network Drives
            3 Disconnect from all Network Drives
            4 Change Network Settings

            9 Back to previous Menu

Your choice [1, 2, 3, 4, 9]:?
```

7. Press 9 twice.

The following menu is displayed:

```
PLEASE SELECT
        1 Manage Network Drives

        4 Change Install Directory
        5 Install from G:

        9 Back to previous Menu

Your choice [1, 4, 9]:?
```

The newly activated network connection can be installed with option 5.
If the software to be installed is located in a subdirectory of the shared directory,
you can change the installation directory as follows.

Changing the installation directory on the connected drive

You can change the installation directory on the connected PG/PC as follows:

8. Select option 4.

An input screen appears in which you can specify the installation directory (e.g.,
HMI_INST):

```
Old Install Directory:                 G:\
New Install Directory:                 G:\HMI_INST
```

You can now start the transfer:

```
            PLEASE SELECT:

            1 Manage Network Drives

            4 Change Install Directory
            5 Install from G:\HMI_INST

            9 Back to previous Menu

        Your Choice [1,2,3,4,5,9]?
```

9. Select option 5.

Installing

- The system starts the transfer from the PG/PC to the PCU.
- The PCU is automatically rebooted after the transfer.
- Select "SINUMERIK" in the Boot Manager. The software that has just been transferred is now installed, menu-assisted in some cases.

The system checks whether the D:\INSTALL directory already contains files.

Note

If the software cannot be copied to the D:\INSTALL directory on the PCU, then the system cannot start the installation.

Installation via a network connection is now complete.

Several installation directories can be set to enable a user setup to be executed automatically. Installation directories are the "Install" subdirectories, which are listed in the SetupDirs section of the E:\Windows\System32\HMIServe.ini parameters file (see also Section 1.5).

Note

The "D:\Install" installation directory is preset there.
The key names contained within a section of the
E:\Windows\System32\HMIServe.ini parameters file must be unique.

Exiting the menu

When you exit the menu, you are prompted to confirm whether you want to save the network connection parameter settings.

3.2 Settings for network drives

Correctly established network connections are absolutely essential to the network drive functions described below. Therefore, a general overview of network connections is provided here.

3.2.1 PG/PC requirements

- Setting NETBEUI (Windows XP only)
  Follow the instructions in the MS Knowledge Base article Q301041
- **Determine** the **computer name** of the
  PG/PC with WIN NT via the Control Panel:
  Start→Settings→Control Panel→"Network" icon→Identification tab→
  "Computer name", e.g.: r3344
- Determine the computer name of the PG/PC with WIN XP
- Via the Control Panel:
  Start→Settings→Control Panel→"System" icon→Computer Name tab,
  "Change" command button, e.g.: r3344
- **Set shared directory**
  Give shared access to the directory in which the software to be installed is stored.
  PC/PG with *Windows NT4*:
  On the desktop, click the directory to which shared access is to be given.
  File → Properties, Sharing tab
          Assign share name: (e.g., HMINEW).
          Comment: any
          User limit: any
  "Permissions" command button:
  Enter permission (e.g., User1 [local user] or "anyone" with access type: "read").
  PG/PC with *Windows XP*:
  Select the directory to be shared and click the right mouse key. Click "Sharing and Security…". Select the "Sharing" tab, activate "Share this folder" and assign a share name and comment if required. Click the "Permissions" command button to set the access rights for users and then click "OK" to leave the Permissions window and the Share window.
- Connect cable
  Cable for point-to-point connection on the Ethernet port Ethernet cable of type "Converted Twisted Pair cable".

3.2.2 Network operation with Windows NT/XP

The PCU 50 contains a network port as standard. The network port is preinstalled such that, for TCP/IP communication to take place, only the PCU's IP address needs to be entered and use of DHCP server needs to be selected once the Ethernet cable has been inserted.

Note

If no fixed Internet address is set for the Ethernet on-board and no DHCP server is available on the network, a so-called APIPA address is assigned under Windows XP. System ramp-up is extended by at least one minute (this is system-related and not an error on the part of the HMI Manager).

NFS client

The NFS client from "Windows Services for UNIX" is installed on E:\SFU\NFSCLIENT.

Entering the IP address

The IP address is entered under
Start → Settings → Control Panel → Network, in the Protocols tab on which the TCP/IP Protocol properties are selected.

PCU 50/70 ID

If it is not already the case, the PCU computer name now has to be made unique in the network.
You can enter the desired ID under Start → Settings → Control Panel → Network on the "Identification" tab.

3.2.3 Settings via the PCU Service menu

Some of the Service menu functions below use network drives as a source or target when installing software or backing up or restoring systems.

When necessary, the **Manage Network Drives** menu is provided in certain places on the operating menu so that the required settings can be made.

You reach this menu as follows, for example:
Main menu (Service menu) →
    1 Install/Update SINUMERIK System →
    Enter password
        3 Install from Network Drive →
           1 Manage Network Drives

You can then choose from the following network management functions:

```
1 Connect to Network Drives
2 Show connected Network Drives
3 Disconnect from all Network Drives
4 Change Network Settings

9 Back to previous menu
```

The following submenus are available for the individual menu items:

1 Connect to Network Drives

```
Type your passwd:
```

Enter the password permitting the user to retrieve data (e.g., software) from or write data (e.g., PCU images) to the shared directory using the networked PG/PC.

PG/PC with Windows NT/XP:
Password for a local user of the PG/PC

PG/PC with Windows 95/98:
Any user name, password identical to the password for directory sharing (if specified).

```
Letter for Network Drive:
```

Enter the letter of the PCU drive from which the connection must be accessed (e.g., "G").

```
Directory to be mounted (e.g., \\r3344\HMINEW):
```

Enter the computer name of the PG/PC and the name of the directory (share name) that you wish to access.

A screenform opens containing data for the PG/PC connection:

```
Machine Name                  : PCU_1_Name
User Name                     : auduser
Transport Protocol            : NETBEUI
Logon to domain               : No
Connect Network Drive (last): G: (\\r3344\HMINEW)

PLEASE SELECT
         1 Connect to Network Drive
         2 Show connected Network Drives
         3 Disconnect from all Network Drives
         4 Change Network Settings

         9 Back to previous Menu

Your choice [1, 2, 3, 4, 9]:?
```

2 Show connected Network Drives

The current status of the connected drives is displayed:

```
      Status          Local Name          Remote Name
      OK              G:                   \\r3344\HMINEW
      OK              H:                   \\r3344\HMI_P1

 Press any key to continue ...
```

3 Disconnect from all Network Drives

Press any key to continue ...
All network connections are terminated.

4 Change Network Settings

The following submenu appears:
```
1 Change Machine Name (for DOS-Net only)
2 Change User name
3 Toggle Protocol (NETBEUI or TCP/IP)
4 Toggle logon to domain (Yes or No)
[5 Change Domain Name]
[6 Change TCP/IP settings]

9 Back to previous menu

Your choice [1, 2, 3, 4, [5,] [6,] 9] ?
```

Change Network Settings menu items:

1 Change Machine Name (for DOS-Net only)

An overview with notes is displayed:

```
CURRENT NETWORK SETTINGS:

  Machine Name          :
  User Name             : USER
  Transport Protocol    : NETBEUI
  Logon to domain       : No


    PLEASE SELECT:

    1 Change Machine Name (for DOS Net only)
    2 Change User name
    3 Toggle Protocol (NETBEUI or TCPIP)
    4 Toggle logon to domain (Yes or No)

    9 Back to previous Menu

Your choice [1,2,3,4,5,6,7,9]?1
```

> HINT: This change is temporary for the DOS net only!
>   On the next Windows start, this Machine Name
>   is reset to the Windows Machine Name.
>   If you want to set the Machine Name permanently,
>   please use "Change Machine Name (for Windows and
>   DOS net)" in the upper menu hierarchy!

> OLD Machine Name: ...
> NEW Machine Name: ...

Note

If no new name is entered, the old name is retained.

2 Change User name

> OLD User Name: ...
> NEW User Name: ...

The note for option 1 applies here too.

3 Toggle Protocol (NETBEUI or TCP/IP)

Each time you press 3 you toggle from the current protocol to the other one. The current protocol setting is displayed in the header for the connection.

Note

If a connection has already been established with NETBEUI, you must restart the system to toggle to TCP/IP. If a connection has not yet been established, you can toggle to the other protocol immediately.
If a connection has already been established with TCP/IP, you must restart the system to toggle to NETBEUI.

If you have toggled to TCP/IP, the expanded Change Network Settings screenform displays an additional point **6 Change TCP/IP settings**, if TCP/IP has been set as the current protocol.

Screenform to toggle from TCPIP → NETBEUI, connection already established:

```
        CURRENT NETWORK SETTINGS:

  Machine Name         : PCUXXXXXXX
  User Name            : auduser
  Transport Protocol   : TCPIP, get IP Addresses automatically via DHCP
  Logon to domain      : No

     PLEASE SELECT:
     1 Change Machine Name (for DOS Net only)
     2 Change User name
     3 Toggle Protocol (NETBEUI or TCPIP)
     4 Toggle logon to domain (Yes or No)
     6 Change TCPIP settings

     9 Back to previous Menu

  Your choice [1,2,3,4,5,6,7,9]?3
```

```
  WARNING:
  You already had a connection with TCPIP, now you want to toggle the protocol.

  You can do this (and save the changes),
  but then you can't connect again without rebooting!

  Do you really want to toggle the protocol [Y,N]?
```

4 Toggle logon to domain (Yes or No)

If Toggle logon to domain is acknowledged with Y, and the domain password is stored in the password list, the system connects to the server immediately and activates the associated login script, if defined.
If Toggle logon to domain is acknowledged with N, a dialog box for entering the domain and password appears. The same applies if the domain password is not included in the password list.
Domain logon is only activated if Y is set.

5 Change DOMAIN Name

This can be used in the same way as the name changes in options 1 and 2.
If Toggle logon to domain was acknowledged with N, the additional item in the Change Network Settings menu, **5 Change DOMAIN Name**, disappears.

6 Change TCP/IP settings

The following suboptions are offered for the TCP/IP protocol:

```
1 Toggle "Get IP Addresses" (automatically or manually)
2 Change IP Address
3 Change Subnetmask
4 Change Gateway
5 Domain Name Server
6 Change DNS Extension

9 Back to previous menu

Your choice [1, 2, 3, 4, 5, 6, 9]?
```

Using the suboptions:

1 Toggle "Get IP Addresses"
This option toggles between **automatically** and **manually**. If "automatically" is set,
IP addresses are retrieved via DHCP. A suitable Domain Name Server (DNS) must
then be used.
If "manually" is set, the IP address is entered directly under **2 Change IP Address**.

Note

All IP address/subnetmask entries in this screenform must be entered with a
blank as separator rather than the usual period.
Example: 192 168 3 2 instead of 192.168.3.2

---

2 Change IP Address
If "Get IP Addresses" is set to "manually", the IP address of the PG/PC is entered
here. DHCP cannot be selected.

3 Change Subnetmask
If "Get IP Addresses" is set to "manually", the subnetmask of the PG/PC is entered
here. DHCP cannot be selected. Notation is the same as for IP address with a
blank as a separator.

Old subnetmask: ...
New subnetmask: <Subnetmask>

4 Change Gateway
If "Get IP Addresses" is set to "manually", the gateway is entered here. The
gateway is entered as an IP address.

Old gateway: ...
New gateway: <IP address>

5 Domain Name Server
If "Get IP Addresses" is set to "automatically" via DHCP, the IP address of the
Domain Name Server (DNS) is entered here. DHCP normally has a suitable
Domain Name Server. If the DNS has access to the correct computer/IP address
assignment, nothing has to be entered here.

6 Change DNS Extension
The DNS extension, e.g., SIEMENS.COM, is entered here.

Exiting the menu

When you exit the menu, you are prompted to confirm whether you want to save the network connection parameter settings.

3.3 Network operation with the SINUMERIK desktop

SINUMERIK desktop

The SINUMERIK desktop also functions as a service mode that can use the Windows functionality to commission the controller.

It also functions as a platform for network operation (e.g., for installing HMI system software), for setting the runtime environment for the HMI system software or for measures relating to the system, such as authorizing SIMATIC STEP 7, checking the hard disk, checking the version, etc.

Details can be found in the "SINUMERIK desktop functions" section.

Network port

The PCU has one network port as standard:

Windows NT	Windows XP
The network port is preinstalled such that, for TCP/IP communication to take place, only the PCU's IP address needs to be entered and use of DHCP server needs to be selected once the Ethernet cable has been inserted.	Connect the Ethernet cable for TCP/IP communication. The default setting is DHCP.
To do this, select Start→Settings→Control Panel→ Network, Protocols tab, and select the TCP/IP Protocol properties.	The settings can be adjusted in Start→ Settings→Network Connections→Local Area Connection→ Properties.
If it is not already the case, the PCU computer name now has to be made unique in the network. Select Start→Settings→Control Panel→Network, Identification tab to enter the desired name.	If it is not already the case, the PCU computer name now has to be made unique in the network. Select Start→Settings→Control Panel→System, Computer Name tab, Change command button to enter the desired name.
Network operation: Both the TCP/IP and NETBEUI protocols are preinstalled.	

Connection via TCP/IP

A WINS server can be configured using TCP/IP. The DNS server and DNS extension are omitted. The WINS and gateway entries are also configurable with DHCP, and are displayed.
IP addresses can now also be entered with "." as a separator.

Note

WINS cannot be preassigned with "0 0 0 0", or the connection to subnets via DHCP will not work.

Post-installing Windows components

Windows NT	Windows XP
Directory I386 from the Windows NT CD is stored on the PCU in **D:\Updates\Base\I386** to allow drivers, for example, to be post-installed.	You will need the Windows XP Recovery CD and Service Pack 2 to post-install individual components.
Software, which may be required for post-installation if third-party applications have been installed, is also stored at **D:\Updates\Base**:	
1. \MDAC21.SP2: Data Access Components V2.1 SP2 (Y2K-compatible)	
2. \SP6a: Windows NT 4.0 Service Pack 6a	See above
3. \DRIVERS\SYSTEM.INI keyboard table (copy to E:\WinNT.40 if required)	3. \DRIVERS\SYSTEM.INI keyboard table (copy to E:\Windows if required).
4. \DRIVERS\E100B: network software	Included on recovery CD
5. \DDEFIX The installation path to be entered for "Install New Fix" is: D:\Updates\Base\DDEFIX\hotfix.inf	
6. \VBFIX Visual Basic Hot fix	
The six system components are installed by file D:\Updates\Base\instspa6a.exe.	The components have to be installed individually if required.

3.3.1 Installing SIMATIC STEP 7 for SINUMERIK hardware

SIMATIC STEP 7 V5.x can be loaded/transferred to the PCU 50 as an AddOn.

Windows NT	Windows XP
Delivery item: SIMATIC STEP 7 V5.1 and V5.2 for PCU 50/70 on CD	**Delivery item:** SIMATIC STEP 7 V5.2 and V5.3 for PCU 50/70 on CD
Components: SIMATIC STEP 7 V5.1 SP2 and AddOn for SINUMERIK 810D/840D(i) Data volume: 430 MB approx.	**Components:** SIMATIC STEP 7 V5.2 and AddOn for SINUMERIK 810D/840D(i) Data volume: 480 MB approx.
Type of delivery: The software comprises two installation packages, STEP 7 V5.1 SP3 and an add-on for use with SINUMERIK 810D/840D(i). This add-on is entered in the system under the name "SINUMERIK 810D/840D V2.2".	**Type of delivery:** The software comprises two installation packages, STEP 7 V5.2 and an add-on for use with SINUMERIK 810D/840D(i). This add-on is entered in the system under the name "SINUMERIK 810D/840D V2.6".
System requirements: PCU 50/70 with basic software 6.1.9 or higher **Recommendation:** Mouse port Installation of this software requires: A network interface or an external CD-ROM drive	**System requirements:** PCU 50/70 with basic software 7.3.2 or higher **Recommendation:** Mouse port Installation of this software requires: A network interface or an external CD-ROM drive

Note (Windows NT)

If STEP 7 5.0 is already installed, we recommend that you uninstall it and delete the associated directory Add_on\step7.

! **Caution**

The "MPI driver" package available on the PCU 50/70 is part of the HMI software and must not be uninstalled!

Operation in Windows NT

This procedure also applies to HMI Advanced with WinNT 4.0.
You must follow the installation sequence described here!

1. Ramp-up the PCU 50 in the Windows NT desktop (using Service menu option 4, then 1).

2. Create access to the STEP 7 CD (via a network or an external CD-ROM drive).

3. Switch to the STEP7_V5.1 directory on the CD and call SETUP.EXE. The installation proceeds with operator prompting. You will be prompted to enter the ID number (see CD label). The installation directory on partition F: can be used.
    Press "Skip" to acknowledge the prompt for the license key disk.
    On completion of this setup there is **no need to boot** the PCU 50.

4. Switch to the SINUMERIK_Add_on directory on the CD and call SETUP.EXE. The installation proceeds with operator prompting.
    On completion of this setup you must **boot** the PCU 50. Ramp-up to the Windows NT desktop again.

5. Call the "STEP7 Authorizing" desktop icon.
    STEP 7 is now authorized and can be started from the HMI Advanced software (second menu bar in the area menu, protected to protection level 3).
    The following entries are made automatically in **F:\Add_on\oemframe.ini**:
    [s7tgtopx]
    ; with HMI Advanced: eliminate minimize/maximize buttons
    ; of the Step 7 window
    WindowStyle_Off=196608
    ; with HMI Advanced: switch to previous task when Step 7 is terminated
    nSwitchToTaskAfterTermination= -2

6. These entries may also need to be modified in OEM configurations.

If STEP 7 V5.1 is installed on the controller and V5.0 has to be installed at a later date, directory: F:\mmc2\step7\dat has to be completely deleted after V5.1 is uninstalled and before V5.0 is installed.

Operation in Windows XP

Operation is the same as for Windows NT, but a STEP 7 software version $\geq$ **5.2** must be installed.

STEP 7 must not be installed on partitions D: or E:.
If warning message "WARNING: Application rngofrm didn´t post InitComplete" appears in HMI Advanced on the first ramp-up after installing STEP 7, the PCU 50 has to be rebooted.

3.3.2 Authorizing SIMATIC STEP 7 via the Service menu

Requirements

The SIMATIC STEP7 V5.x software for SINUMERIK hardware is already installed. STEP 7 V5.0 and STEP 7 V5.2 can be authorized.

Operation

While the PCU is ramping up (after switching the controller off and then on again):

1. Select the Service menu [hidden menu entry] in the Boot Manager

The following menu is displayed:

```
        PLEASE SELECT

        1 Install/Update SINUMERIK System
        2 SINUMERIK Tools and Options
        3 DOS Shell
        4 Start Windows (Service Mode)
        5 SINUMERIK System Check
        7 Backup/Restore
        8 Start PC Link

        9 Reboot (Warmboot)

Your Choice [1, 2, 3, 4, 5, 7, 8, 9]?
```

2. Select option 2

The system will ask you to enter the password:

```
passwd:
```

3. Enter one of the passwords for authorization levels 0 – 2.
   - System
   - Manufacturer
   - Service

The following menu is displayed:

```
        PLEASE SELECT

        1 Activate Step7 for PCU

        9 Return to Main Menu

Your Choice [1, 9] ?
```

Authorizing

     4. Select option 1

Booting

The system will then reboot automatically.
The actual authorization takes place next time Windows NT/XP is ramped up,
before the HMI system software is started.

Note

The authorization can also be checked on the SINUMERIK desktop by starting
the "STEP7 Authorizing" function.

3.3.3 Authorizing SIMATIC STEP 7 via the SINUMERIK desktop

The "STEP7 Authorizing" function is available as a script file on the SINUMERIK
desktop. This function authorizes the SIMATIC STEP 7 software if it has been
installed previously.

Note

The function can also be triggered from the Service menu (DOS). It is then
executed during the Windows ramp-up (before the HMI system software is
started), without displaying the SINUMERIK desktop.

■

4

4 Backing Up and Restoring Data

Application

The entire contents of hard disks can be saved as a disk image using the Norton Ghost utility. These disk images can be stored on various data carriers and the data restored to the hard disk at a later date.

PCU replacement hard disks and complete PCU hard disks are supplied by the plant with Norton Ghost already installed. Norton Ghost is used in some of the backup and restore procedures described below.

More information is available on the Internet at www.ghost.com.

4.1 Backing up/restoring data with an Ethernet connection

4.1.1 Backing up the PCU hard disk to the PG/PC hard disk
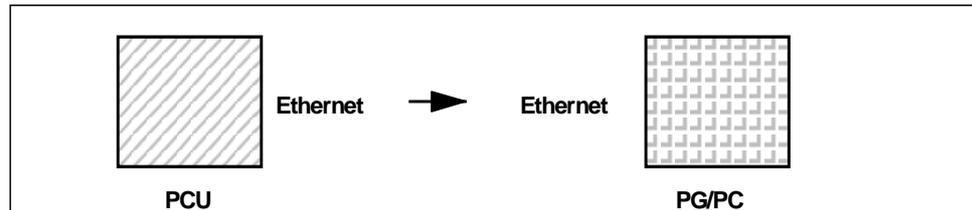
Fig. 4-1: Backing up the hard disk

Requirements

- Ghost version 6.x/7.x (>= 7.x required for Windows XP) is installed on the PCU and on the PG/PC.

- The Ghost versions on the PCU and the PG/PC must be the same.

- The directory in which the backup image is to be stored exists on the PG/PC.

- There is sufficient free memory on the PG/PC.

- Windows (any version) is installed on the PG/PC.

- The PCU and PG/PC are connected with an Ethernet cable.

Operation

While the PCU is ramping up (after switching the controller off and then on again)
1.   Select the "Service menu" [hidden menu entry] in the Boot Manager.
The following menu is displayed:

```
        PLEASE SELECT:

        1 Install/Update SINUMERIK System
        2 SINUMERIK Tools and Options
        3 DOS Shell
        4 Start Windows (Service Mode)
        5 SINUMERIK System Check
        7 Backup/Restore
        8 Start PC Link

        9 Reboot (Warmboot)

    Your Choice [1,2,3,4,5,7,8,9]?
```

2.   Select option 7.

The system will ask you to enter the password:

```
passwd:
```

3. Enter one of the passwords for authorization levels 0 - 2.
   - System
   - Manufacturer
   - Service

The following menu is displayed:

```
            PLEASE SELECT:

            1 Harddisk Backup/Restore with GHOST
            4 Partitions Backup/Restore with GHOST (locally)
            5 ADDM Backup/Restore

            9 Back to Main Menu

      Your Choice [1,4,9]?
```

Select option 1.

The following menu is displayed:

```
            PLEASE SELECT:

            1 Configure GHOST Parameters
            2 Harddisk Backup to <path>, Mode ...
            3 Harddisk Restore from <path>, Mode ...
            4 Switch to other Version of GHOST

            9 Back to previous Menu

      Your Choice [1,2,3,9]?
```

Note

The path names are default settings and depend on the drive.
You can change these path names.

"Optional" start

The following steps are only applicable if you wish to change the default settings.

Setting Ghost parameters

Set the parameters for Norton Ghost

<1> Configure GHOST Parameters

The following menu is displayed:

```
          PLEASE SELECT:

          1 Set Connection Mode PARALLEL (LPT:)
          2 Set Connection Mode LOCAL/NETWORK
          3 Change Backup Image Filename
          4 Change Restore Image Filename
          5 Change Machine Name (for Windows and DOS net)
          6 Manage Network Drives
          7 Change Split Mode

          9 Back to previous Menu

     Your Choice [1, 2, 3, 4, 5, 6, 7, 9]?
```

Here you can set the interface type, the network connection, the backup image path, and the backup image split mode.

Setting the interface

- **Change interface:**
  Select **<2> Set Connection Mode LOCAL/NETWORK**
  and confirm.

  Notice:
  For the network connection described here, the interface type must always be set to LOCAL/NETWORK.

Connecting to the network drive

- **Establish/change network connection:**
  <6> Manage Network Drives

  See 7.2 for details.

Setting the backup image

- **Change the backup image path:**
  <3> Change Backup Image Filename:
  Set up the entire path name for the backup file on the PG/PC, e.g.,
  C:\SINUBACK\PCU\HMI.gho.

Splitting the backup image

- **Backup image split mode:**
  <7> Change Split Mode

  Choose whether you wish to split the backup image into portions and, if so,
  enter the split size (max. split size: 2048 MB; default split size: 640 MB). The
  names of the split files are assigned as follows:
  <name>.gho
  <name>.001
  <name>.002
  <name>. ...

Exiting the menu

- Return to the previous menu:
  < 9 > Back to previous Menu

  Prompt: Save GHOST parameters? Answer Yes.

"Optional" end

The following steps are always applicable.

Backing up the hard disk

You can now start the transfer:
Back up the hard disk
   < 2 > Harddisk Backup to <pathname>, Mode LOCAL/NETWORK

Selecting this option opens the following menu if local partition data backups are
available: (See Backing up/restoring partitions).

```
PLEASE SELECT:

1 Backup WITHOUT Local Images
2 Backup WITH Local Images

  Your Choice [1,2]?
```

If you do NOT want to back up local partition data (substantial reduction in transfer
time and memory), select:

Option **1 "Backup WITHOUT Local Images"**, otherwise
select option **2 "Backup WITH Local Images"**.

* A message window then opens:

  You are prompted to check whether a connection exists between the PCU and
  the PG/PC. The target path for the directory on the PG/PC in which the backup
  image is to be stored is displayed.
  You are prompted to check whether this directory exists on the PG/PC.

> * *PCU:*
> Type "Y" in the message window to acknowledge and start the backup.
>
> * *PCU:*
> The Norton Ghost message window appears with:
> display of the transfer progress
> display of the paths used
> details of the aggregates to be transferred.
>
> **PCU**
> If the backup is cancelled, a query appears:
> Do you want to try to backup again [Y,N]?
> Press N to return to the main menu.
> Press "Y" to restart the backup from scratch.

Exiting the menu

> **<9> "Back to previous Menu".**
> Returns you to the previous menu

Disconnecting connected network drives:

> You can disconnect all connections to the PG/PC (see 7.2).

4.1.2 Restoring the PCU hard disk from the PG/PC hard disk
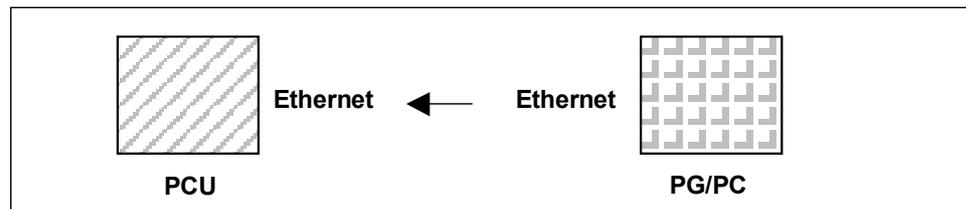
Fig. 4-2: Restoring hard-disk content

Requirements

- Ghost version 6.x/7.x is installed on the PCU and on the PG/PC.
- The directory in which the restore image is stored exists on the PG/PC.
- Windows (any version) is installed on the PG/PC.
- The PCU and PG/PC are connected with an Ethernet cable.

Operation

> **1. Switch on the PG/PC and insert the CD into the drive.**
> While the PCU is ramping up (after switching the controller off and then on again)
> **2. Select the "Service menu" [hidden menu entry] in the Boot Manager.**

The following menu is displayed:

```
        PLEASE SELECT:

        1 Install/Update SINUMERIK System
        2 SINUMERIK Tools and Options
        3 DOS Shell
        4 Start Windows (Service Mode)
        5 SINUMERIK System Check
        7 Backup/Restore
        8 Start PC Link

        9 Reboot (Warmboot)

    Your Choice [1,2,3,4,5,7,8,9]?
```

3. Select option 7.

The system will ask you to enter the password:

```
 passwd:
```

4. Enter one of the passwords for authorization levels 0 - 2.

  - System
  - Manufacturer
  - Service

The following menu is displayed:

```
        PLEASE SELECT:

        1 Harddisk Backup/Restore with Ghost
        4 Partitions Backup/Restore with Ghost
        5 ADDM Backup/Restore

        9 Return to Main Menu

    Your Choice [1, 4, 5, 9]?
```

5. Select option 1.

The following menu is displayed:

```
        PLEASE SELECT:

        1 Configure GHOST Parameters
        2 Harddisk Backup to <path>, Mode ...
        3 Harddisk Restore from <path>, Mode ...
        4 Switch to other Version of GHOST

        9 Back to previous Menu

    Your Choice [1, 2, 3, 4, 9]?
```

Note

The path names are default settings and depend on the drive. You can change
these path names.

"Optional" start

The following steps are only applicable if you wish to change the default settings.

Setting Ghost parameters

6.   Set the parameters for Norton Ghost

< 1 >Configure GHOST Parameters

The following menu is displayed:

```
              PLEASE SELECT:

              1 Set Connection Mode PARALLEL (LPT:)
              2 Set Connection Mode LOCAL/NETWORK
              3 Change Backup Image Filename
              4 Change Restore Image Filename
              5 Change Machine Name (for Windows and DOS net)
              6 Manage Network Drives        [See 7.2]
              7 Change Split Mode

              9 Back to previous Menu

          Your Choice [1, 2, 3, 4, 5, 6, 7, 9]?
```

Here you can set the interface type, the network connection, the backup image
path, and the restore image path.

Setting the interface

6.1 Change interface:

Select **<2> Set Connection Mode LOCAL**

and confirm.

!   **Important**

For the network connection described here the interface type must always be set
to LOCAL/NETWORK.

Connecting to the network drive

6.2 Establish/change network connection

<6> Manage Network Drives

Setting the restore image

6.2 Change the image path:

< 4 > Change Restore Image Filename

Set up the entire path name for restore file HMI.Gho on the PG/PC, e.g.,
C:\SINUBACK\PCU\HMI.gho.

Exiting the menu

6.3 Return to the previous menu:

< 9 > Back to previous Menu

Prompt: Save GHOST parameters? Answer Yes.

"Optional" end

Restoring the hard disk

Restore contents of hard disk

<3> Harddisk Restore from <pathname>, Mode LOCAL

Selecting this option opens the following menu:

```
For partitioning the disk it's important to know the
SYSTEM BASE of the imaged configuration.
 Please select the SYSTEM BASE the image was created by!
.

          PLEASE SELECT:

   [Basic software NT Vers. 7.3.2]   [Basic software XP Vers. > 7.3.2]
     1 Windows NT                      1 Windows XP
     2 Win95                           2 Windows NT
     3 WfW3.11                         3 Win95
     4 DOS (spare part)                4 WfW3.11
                                       5 DOS (spare part)


     9 Back to previous Menu          9 Back to previous Menu

   Your Choice [1, 2, 3, 4, 9]?       Your Choice [1, 2, 3, 4, 5, 9]?
```

Select the operating system on which the restore image is based. This affects the
type of hard disk partitioning that is performed.

When you select the appropriate operating system, another menu opens:

> What kind of disk partitioning do you want?
>
> 1 Standard Partitioning (default)
> 2 User-defined Partitioning
> 3 Image-Partitioning
>
> Your Choice [1, 2, 3]?

Specify whether you want standard hard disk partitioning, i.e., with a fixed number and size of partitions (depending on the operating system), or whether you want to define the partitioning yourself. In the first case, Norton Ghost sets the partition parameters automatically, whereas in the second case the user sets the partition parameters in Norton Ghost. In the third case, the image to be loaded determines the partitioning.

< 9 > Back to previous Menu
Return to the previous menu

On first commissioning or restore only (selected automatically with Ghost or Restore): Select the following menu from the "1 Configure GHOST Parameters" menu:

Setting the PCU network name

> If your machine is part of a NETWORK, it needs a machine
> name that is unique in the overall network.
>
> The restore image brings along a machine name.
> You can change this machine name now.
>
> CAUTION:
> The machine name shouldn't be changed, if
>   1. the restore image is a backup image of your machine
>   AND
>   2. the name of your machine hasn't been changed since
>   creating the backup image.
>
> NOTE for networks that require Microsoft Domain security:
>   Whenever you change the machine name (even if you
>   input a name identical to the machine name contained
>   in the restore image), your machine and its users will
>   NO LONGER belong to the Microsoft network domain.
>   (See also the Microsoft documentation)

Press any key to continue . . .

```
┌─────────────────────────────────────────────────────────────────┐
│   Do you REALLY want to input a new machine name?                 │
│                                                                   │
│   If you want to input the new machine name MANUALLY,             │
│     1. don't use "/\[]:;|<>+=,?*" and blanks AND                  │
│     2. the new machine name has to be EXACTLY as long as          │
│        the old machine name used within the restore image.        │
│                                                                   │
│   If you don't want to input a new machine name, the ma-          │
│   chine name used within the restore image keeps valid.           │
│                                                                   │
│   HINT: if you want to input a machine name with a                │
│         different length, you have to do this in Windows!         │
│                                                                   │
└─────────────────────────────────────────────────────────────────┘
```

```
┌─────────────────────────────────────────────────────────────────┐
│   PLEASE SELECT:                                                  │
│                                                                   │
│     1 Input Machine Name MANUALLY                                 │
│     2 Input Machine Name RANDOMLY                                 │
│                                                                   │
│     9 No new Machine Name                                         │
│                                                                   │
│   Your Choice [1,2,9]?                                            │
└─────────────────────────────────────────────────────────────────┘
```

You can choose to enter a computer name for the PCU yourself or have a name generated automatically:

* Enter name yourself:
    < 1 > Input Machine Name MANUALLY
An input screen is opened in which the new 10-character name can be entered. On pressing Enter to confirm, the name is changed in the system.
Default name: PCUxxxxxxx [10 characters].

* Enter name automatically:
    < 2 > Input Machine Name RANDOMLY
A name is generated automatically and changed in the system. If required, the name can be viewed via the Windows Control Panel
NT: Start->Settings->Control Panel->Network: Identification
XP: Start→Settings→Control Panel→"System" icon→Computer Name tab.

  * *PCU:*

    The Norton Ghost message window appears with:
    display of the transfer progress
    display of the paths used
    details of the aggregates to be transferred.

If standard commissioning is to be performed from a GHOST image, the current PCU name must be set instead of the name contained in the GHOST image.

The new computer name (including the name generated randomly with option 2) and the new system ID (SID) are assigned to the PCU with the Ghostwalker utility.

On completion of the Ghostwalker sequence, the operator is given the opportunity to repeat the restore process. This function is needed if the restore process has not been carried out correctly (e.g., connection problems, canceled by the user, etc.). If there is no operator input within 5 seconds, the PCU is restarted automatically. The computer name can be changed in Windows if required.

```
It seems, that Ghost Restore succeeded.

But if there was no connection or a cancel of the Restore,
Ghost reports NO Errors! So you have the chance to:

PLEASE SELECT:

1 Reboot the System (default after 5 Seconds)
2 Try the Harddisk Restore again

9 Back to previous Menu

Your Choice [1, 2, 9]?
```

You can change the computer name again at a later stage by selecting option 5 "Change Machine Name (for Windows and DOS net)" in submenu Backup/Restore-> Harddisk Backup/Restore with GHOST->Configure GHOST Parameters. This change is also made via Ghostwalker.

Booting

8.   **The system must be booted following a successful restore process.**

!   **Important**

If the restore process was interrupted, the system on the hard disk will be incomplete. In this situation, a boot diskette with Norton Ghost and the network software is required. The boot diskette is available from eSupport.

4.1.3 Commissioning the replacement hard disk

The mechanical and electrical steps involved in replacing the HMI hard disk are described in:
References: /BH/, Operator Components Manual

The process for restoring the data backup of an entire hard disk, in order to always have user and system data available for service purposes, is described below.

Norton Ghost

The entire contents of hard disks can be saved as a disk image file using the Norton Ghost utility. This disk image file can be stored on various data carriers and the data restored to the hard disk at a later date.
PCUs and replacement hard disks are supplied by the plant with Norton Ghost already installed.

Note

Recommendation:
Archive the hard disk backup (hard disk image), including the Norton Ghost utility, on CD.

Restoring data backup

Requirements:
- Ghost is installed on the PG.
- A new replacement hard disk has been obtained.
- The HMI is connected to the PC/PG with a parallel cable.
- The Windows 3.x or Windows 95 operating system is installed on the PG and a CD drive is available.

1. Install the new replacement hard disk in the PCU or install the new HMI (see instructions supplied with the hard disk)
   – Click the hard disk into place
   – Plug in the connecting cable from the hard disk to the PCU
   – Secure the hard disk with the 4 knurled-head screws
   – Release the transport lock: Turn towards "operating" until it engages.
   References: /BH/, Operator Components Manual

Note

The replacement hard disk does not contain a Windows NT operating system or HMI system software.

---

2. Switch on the PG and insert the CD in the drive.
3. Switch the controller off and then on and select the Service menu in the Boot Manager. Select menu "4: Backup/Restore".
4. Select: **7 Backup/Restore**
5. Enter password.
6. Select menu **1 "Hard disk Backup/Restore with Ghost"**
7. Set parameters for Norton Ghost:
   – **<1> Configure Ghost parameters**:
   – **<3> Harddisk Restore** from <pathname>, Mode **PARALLEL**
   * If this menu is selected, a message window appears:
   You are prompted to check whether a connection exists between the HMI and the PG/PC. The HMI image file to which the restore process is to be loaded is created.

PG/PC:
In a DOS window or at the DOS level enter the command
ghost –lps to start Norton Ghost.

HMI:
Start the restore process by acknowledging the message window (Yes).

HMI:
The Norton Ghost message window appears with:
display of the transfer progress
display of the paths used
details of the aggregates to be transferred.

Note

If the data transfer is interrupted during the restore process, the system on the hard disk will be incomplete. Therefore, an HMI boot diskette containing MS–DOS _ 6.X–Boot and Norton Ghost software is required.

– **<9> Back** to previous menu
Return to main menu

8. **After a successful restore:**
The HMI is booted automatically.
Duration: Approximately 15 - 20 minutes to generate a compressed disk image = 130 MB from a 540 MB hard disk via LPT.

4.2 Backing up and restoring PCU partitions locally

Backing up partitions

In addition to backing up the entire contents of the hard disk onto an external drive, you can also back up partitions C:, E:, and F: of the PCU locally onto partition D: of the PCU (partition data backup).
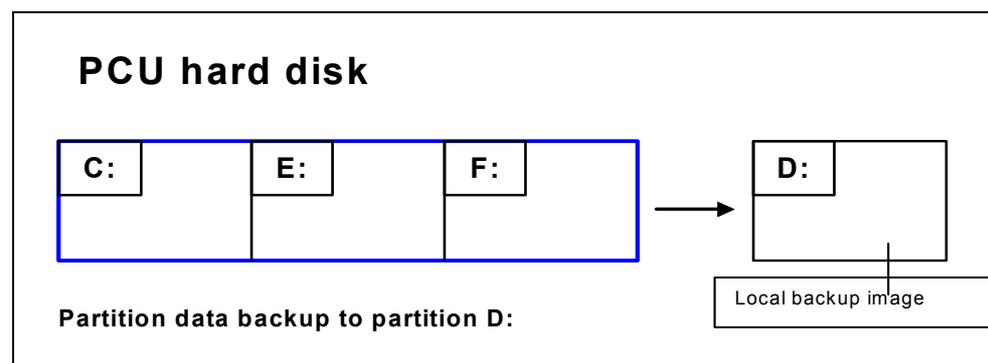
Fig. 4-3: Partition data backup

Restoring partitions (general procedure)

The local backup image generated by a partition data backup can be used to restore partitions C:, E: and F: again if necessary (partition data restore).
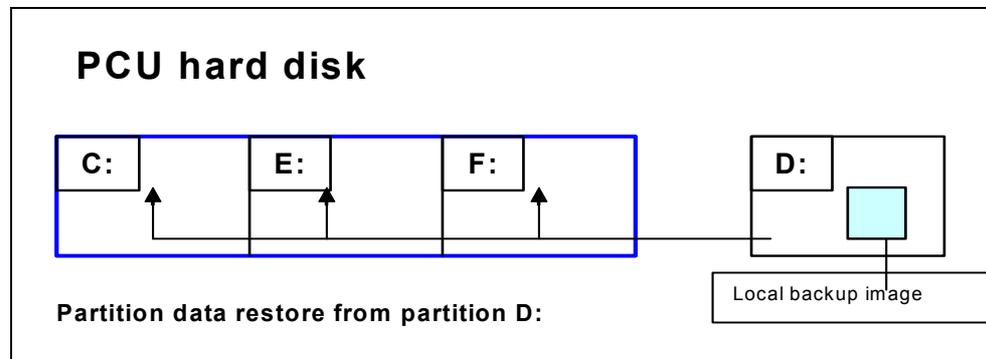
Fig. 4-4: Partition data restore

Restoring partition E (Windows)

A local backup image can also be used to restore only partition E: (Windows), if required. This can be necessary if, for example, Windows can no longer be booted after a system crash or uncontrolled shutdown of the PCU (partition E data restore).
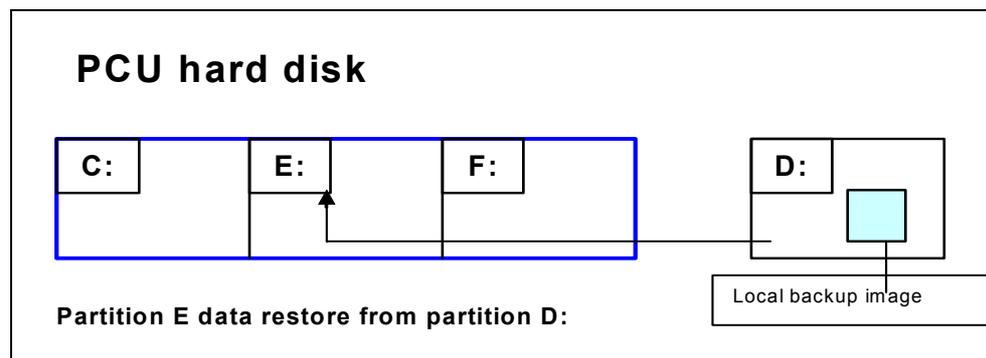
Fig. 4-5: Partition E restore

Theoretically, any of the local backup images currently located on partition D: can be used in a partition data restore or a partition E data restore.

Of course, in the case of partition E data restore, the local backup image used must be chosen with great care: The registry entries of all applications installed on partition F: are also expected on the partition E: to be restored.

It is, therefore, practical to always have a particular local backup image (emergency backup image) defined, which can be loaded in case of an emergency (Windows cannot be booted) using partition E data restore without impairing execution of the installed applications.

Definition of a local backup image for a possible emergency and simple starting of the partition E data restore in the event of an emergency are supported in the Service menu.

The maximum number of local backup images permitted on partition D: at the same time is adjustable (<= 7).

4.2.1 Backing up partitions

PCU hard disk

| C: | | E: | | F: | | | D: |

Local backup image

Partition data backup to partition D:
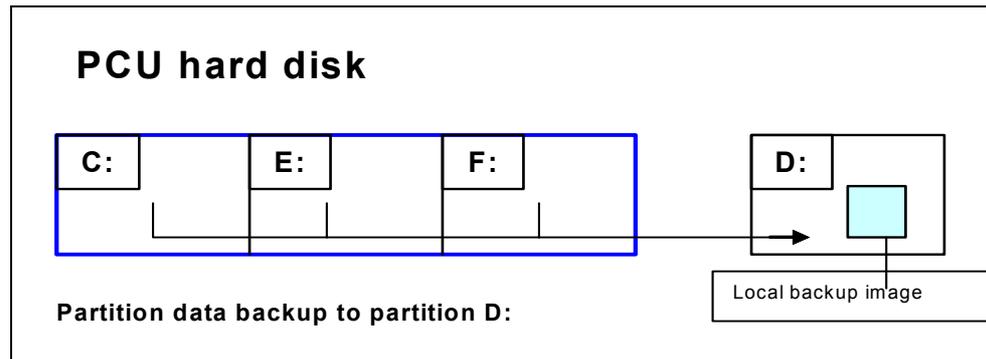
Fig. 4-6: Partition data backup

Operation

While the PCU is ramping up (after switching the controller off and then on again)
1. Select the "Service menu" [hidden menu entry] in the Boot Manager.

The following menu is displayed:

```
PLEASE SELECT:

1 Install/Update SINUMERIK System
2 SINUMERIK Tools and Options
3 DOS Shell
4 Start Windows (Service Mode)
5 SINUMERIK System Check
7 Backup/Restore
8 Start PC Link

9 Reboot (Warmboot)

Your Choice [1,2,3,4,5,7,8,9]?
```

2. Select option 7.
The system will ask you to enter the password:

```
passwd:
```

3. Enter one of the passwords for authorization levels 0 - 2.

   - System
  - Manufacturer
  - Service

The following menu is displayed:

```
PLEASE SELECT:

1 Harddisk Backup/Restore with GHOST
4 Partitions Backup/Restore with GHOST (locally)
5 ADDM Backup/Restore

9 Back to Main Menu

Your Choice [1, 4, 5, 9]?
```

4. Select option 4.

The following menu is displayed:

```
PLEASE SELECT:

1 Configure GHOST Parameters
2 Partitions Backup, Mode LOCAL
3 Partitions Restore, Mode LOCAL
4 Partition E (only Windows) Restore, Mode LOCAL
8 Delete Image

9 Back to previous Menu

Your Choice [1, 2, 3, 4, 8, 9]?
```

"Optional" start

The following steps are only applicable if you wish to change the default settings.

Changing the max. backup images

**5. Set the maximum number of local backup images (max. 7)
  < 1 > Configure GHOST Parameters:**

The following menu is displayed:

```
        GHOST Connection Mode  : LOCAL
        Maximum Backup Images  : 1
        Current Backup Images     : 0

        PLEASE SELECT:

            1 Change Maximum Backup Images
            2 Define Emergency Backup Image

            9 Back to previous Menu

        Your Choice [1,2,9]?
```

To change the preset maximum number of local backup images, select menu 1:

Enter a new number (max. 7).

- Prompt: Save GHOST parameters? Answer Yes.

Exiting the menu

< 9 > Back to previous Menu Return to previous menu

"Optional" end

The following steps are always applicable.

Backing up partitions

**6. Select option 2.
  < 2 > Partitions Backup, Mode LOCAL**

You are prompted for the **name** under which the new local backup image is to be stored, e.g., BACKUP1. Length of name: **max. 7 characters**.

Under "**Description**" you are asked whether you want to store an additional description for the local backup image, e.g., "Data backup1 by Hugo".
In the restore process, this additional description is offered as a selection text in the list of available backup images (if there is no description, the name of the backup image is displayed in the list).

You are asked whether you want the new local backup image to be used as an emergency backup image too (and any existing emergency backup image to be deleted). Partition data backup to D: is then started.

A file is created on D: in the IMAGES directory for every partition, e.g., BACKUP1.gh1, BACKUP1.gh3, BACKUP1.gh4. In the restore process, they are recognized as logically belonging to one backup image.

On completion of the partition data backup, the message "Backup finished" is displayed.

Exiting the menu

< 9 > Back to previous Menu
Return to previous menu

4.2.2 Restoring partitions
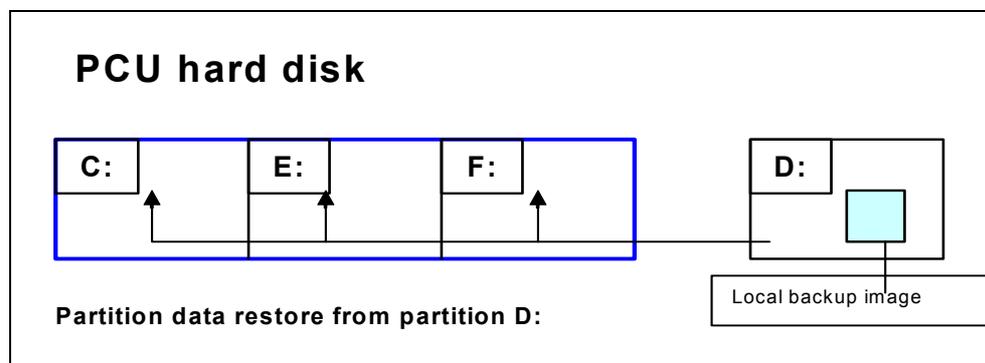
Fig. 4-7: Partition data restore

Operation

While the PCU is ramping up (after switching the controller off and then on again)

1. Select the "Service menu" [hidden menu entry] **in the Boot Manager**.

The following menu is displayed:

```
            PLEASE SELECT:

            1 Install/Update SINUMERIK System
            2 SINUMERIK Tools and Options
            3 DOS Shell
            4 Start Windows (Service Mode)
            5 SINUMERIK System Check
            7 Backup/Restore
            8 Start PC Link

            9 Reboot (Warmboot)

        Your Choice [1,2,3,4,5,7,8,9]?
```

2. Select option 7.

The system will ask you to enter the password:

passwd:

3. Enter one of the passwords for authorization levels 0 - 2.

  - System
  - Manufacturer
  - Service

The following menu is displayed:

```
        PLEASE SELECT:

        1 Harddisk Backup/Restore with GHOST
        4 Partitions Backup/Restore with GHOST (locally)
        5 ADDM Backup/Restore

        9 Back to Main Menu

    Your Choice [1, 4, 5, 9]?
```

4. Select option 4.

The following menu is displayed:

```
        PLEASE SELECT:

        1 Configure GHOST Parameters
        2 Partitions Backup, Mode LOCAL
        3 Partitions Restore, Mode LOCAL
        4 Partition E (only Windows) Restore, Mode LOCAL
        8 Delete Image

        9 Back to previous Menu

    Your Choice [1,2,3,4,8,9]?
```

Restoring a partition

5. Select option 3.
< 3 > Partitions Restore, Mode LOCAL

You are asked which local backup image you wish to restore, e.g., "Data backup1 by Hugo".

```
    PLEASE SELECT IMAGE:

            1       PCU basic software V06.00.02 Win NT 4.0
                    [02-01-2000: 05:32:32pm]
  EMERG     2       Data backup1 by Hugo [02-03-2000; 04:53:24pm]
            .       ...
            9       Back to previous Menu

    Your Choice [1, 2, ... , 9]?
```

Select the backup image you require.

On confirming your choice, the warning "All data will be overwritten" is displayed and restoration of the chosen backup image to partitions C:, E: and F: is started.

On completion of the partition data restore, the message "Restore finished" is displayed.

After each restore process, partitions E: and F: are checked by the CHKDSK test program the next time Windows is ramped up.
A reboot is performed between the checks on the E: and F: partitions.

4.2.3 Restoring partition E: (Windows) on the PCU
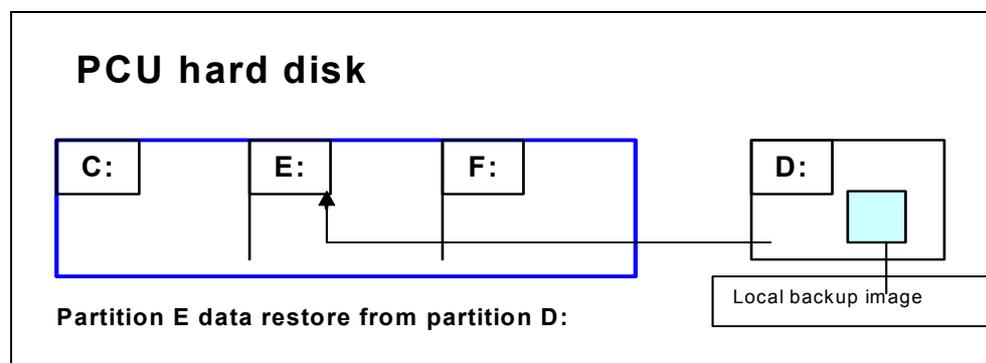
Fig. 4-8: Partition E data restore

Operation

While the PCU is ramping up (after switching the controller off and then on again)

1. Select the "Service menu" [hidden menu entry] **in the Boot Manager**.

The following menu is displayed:

```
           PLEASE SELECT:

           1 Install/Update SINUMERIK System
           2 SINUMERIK Tools and Options
           3 DOS Shell
           4 Start Windows (Service Mode)
           5 SINUMERIK System Check
           7 Backup/Restore
           8 Start PC Link

           9 Reboot (Warmboot)

      Your Choice [1,2,3,4,5,7,8,9]?
```

2.   Select option 7.

The system will ask you to enter the password:

passwd:

3.   Enter one of the passwords for authorization levels 0 - 2.

   - System
   - Manufacturer
   - Service

The following menu is displayed:

> PLEASE SELECT:
>
> 1 Harddisk Backup/Restore with GHOST
> **4 Partitions Backup/Restore with GHOST (locally)**
> 5 ADDM Backup/Restore
>
> 9 Back to Main Menu
>
>   Your Choice [1, 4, 5, 9]?

4.   Select option 4.

The following menu is displayed:

> PLEASE SELECT:
>
> 1 Configure GHOST Parameters
> 2 Partitions Backup, Mode LOCAL
> 3 Partitions Restore, Mode LOCAL
> **4 Partition E (only Windows) Restore, Mode LOCAL**
> 8 Delete Image
>
> 9 Back to previous Menu
>
>   Your Choice [1,2,3,4,8,9]?

Restoring partition E

5.   Select option 4.
   < 4 > Partition E (only Windows) Restore, Mode LOCAL

You are asked which local backup image's partition E: (Windows partition) you
wish to restore, e.g., "Data backup1 by Hugo".

> PLEASE SELECT:
>
> - as for **Restoring a partition**

Select the backup image you require:

On confirming your choice, the warning:

"The Windows partition will be overwritten" is displayed and the restore process for partition E: is started.

On completion of the partition E data restore, the message "Restore finished" is displayed.

Partition E: is checked by the CHKDSK test program the next time WinNT is ramped up.

4.2.4 Deleting the backup image

Operation

While the PCU is ramping up (after switching the controller off and then on again)

1.   Select the "Service menu" [hidden menu entry] in the Boot Manager.

The following menu is displayed:

> PLEASE SELECT:
>
> 1 Install/Update SINUMERIK System
> 2 SINUMERIK Tools and Options
> 3 DOS Shell
> 4 Start Windows (Service Mode)
> 5 SINUMERIK System Check
> **7 Backup/Restore**
> 8 Start PC Link
>
> 9 Reboot (Warmboot)
>
> Your Choice [1, 2, 3, 4, 5, 7, 8, 9]?

2.   Select option 7.

The system will ask you to enter the password:

passwd:

3. Enter one of the passwords for authorization levels 0 - 2.

- System
- Manufacturer
- Service

The following menu is displayed:

```
        PLEASE SELECT:

        1 Harddisk Backup/Restore with GHOST
        4 Partitions Backup/Restore with GHOST (locally)
        5 ADDM Backup/Restore

        9 Back to Main Menu

    Your Choice [1, 4, 5, 9]?
```

4. Select option 4.

The following menu is displayed:

```
        PLEASE SELECT:

        1 Configure GHOST Parameters
        2 Partitions Backup, Mode LOCAL
        3 Partitions Restore, Mode LOCAL
        4 Partition E (only Windows) Restore, Mode LOCAL
        8 Delete Image

        9 Back to previous Menu

    Your Choice [1, 2, 3, 4, 8, 9]?
```

Deleting the backup image

5. Select option 8.
    < 8 > Delete Image

From the list of available backup images, select the one you wish to delete.

The system asks you whether you really want to delete the image.

Confirm with "Y" to delete the backup image.

Exiting the menu

< 9 > Back to previous Menu
Return to previous menu

4.2.5 Defining an emergency backup image

Operation

While the PCU is ramping up (after switching the controller off and then on again)
1. **Select the "Service menu"** [hidden menu entry] **in the Boot Manager**.

The following menu is displayed:

```
PLEASE SELECT:

1 Install/Update SINUMERIK System
2 SINUMERIK Tools and Options
3 DOS Shell
4 Start Windows (Service Mode)
5 SINUMERIK System Check
7 Backup/Restore
8 Start PC Link

9 Reboot (Warmboot)

Your Choice [1,2,3,4,5,7,8,9]?
```

2. **Select option 7.**

The system will ask you to enter the password:

```
passwd:
```

3. **Enter one of the passwords for authorization levels 0 - 2.**
   - System
   - Manufacturer
   - Service

The following menu is displayed:

```
PLEASE SELECT:

1 Harddisk Backup/Restore with GHOST
4 Partitions Backup/Restore with GHOST (locally)
5 ADDM Backup/Restore

9 Back to Main Menu

Your Choice [1, 4, 5, 9]?
```

4. **Select option 4.**

The following menu is displayed:

```
PLEASE SELECT:

1 Configure GHOST Parameters
2 Partitions Backup, Mode LOCAL
3 Partitions Restore, Mode LOCAL
4 Partition E (only WinNT) Restore, Mode LOCAL
8 Delete Image

9 Back to previous Menu

Your Choice [1,2,3,4,8,9]?
```

Defining an emergency backup image

5. Select option 1.

< 1 > Configure GHOST Parameters

The following menu is displayed:

```
PLEASE SELECT:

1 Change Maximum Backup Images
2 Define Emergency Backup Image

9 Back to previous Menu

Your Choice [1, 2, 9]?
```

6. Select option 2.

You are asked which local backup image you want to use as the emergency
backup image (this choice can be changed at any time).

```
PLEASE SELECT EMERGENCY IMAGE:

        1 PCU basic software V06.00.02 Win NT 4.0
          [02-01-2000: 05:32:32pm]

EMERG  2 Data backup1 by Hugo
          [02-03-2000; 04:53:24pm]

        3 Data backup2
          [02-05-2000; 07:07:14pm]

        N No Emergency Image

        9 Back to previous Menu

Your Choice [1, 2, 3, N, 9]?
```

Choose the backup image you require, e.g., "Data backup2".
The code "EMERG" for the current emergency backup image is displayed against the chosen backup image:

```
        PLEASE SELECT EMERGENCY IMAGE:

        1 PCU basic software V06.00.02 Win NT 4.0
          [02-01-2000: 05:32:32pm]

        2 Data backup1 by Hugo
          [02-03-2000; 04:53:24pm]

EMERG   3 Data backup2
          [02-05-2000; 07:07:14pm]

        N No Emergency Image

        9 Back to previous Menu

Your Choice [1, 2, 3, N, 9]?
```

Exiting the menu

< 9 > Back to previous Menu
Return to previous menu

4.2.6 Restoring the emergency backup on partition E:

If Windows can no longer be booted after a system crash or uncontrolled shutdown of the PCU, partition E: can be restored using the backup image defined with 7.7.6.

a) Based on one of the local backup images

Requirement: One of the passwords for authorization levels 0 - 2.

b) Based on the **emergency** backup image (provided that a local backup image is defined as the emergency backup image)

Requirement: One of the passwords for authorization levels 0 - 3.
Partition E data restore using the emergency backup image can be started directly from the main menu.

Note

The software for generating emergency boot diskettes is contained in D:\Eboot.

Operation

While the PCU is ramping up (after switching the controller off and then on again)

1. Select the "Service menu" [hidden menu entry] **in the Boot Manager**.

The following menu is displayed:

```
            PLEASE SELECT:

      1 Install/Update SINUMERIK System
      2 SINUMERIK Tools and Options
      3 DOS Shell
      4 Start Windows (Service Mode)
      5 SINUMERIK System Check
      7 Backup/Restore
      8 Start PC Link

      9 Reboot (Warmboot)

      E Restore Windows Partition E (Emergency)

      Your Choice [1, 2, 3, 4, 5, 7, 8, 9, E]?
```

2. Select option E.

The system will ask you to enter the password:

```
passwd:
```

3. Enter one of the passwords for authorization levels 0-3.

- System
- Manufacturer
- Servicer
- Customer

The warning "The Windows partition E: will be overwritten" appears and the restore process for partition E: is started following confirmation of another prompt.

On completion of the partition E data restore, the message "Restore finished" is displayed.

Partition E: is checked by the CHKDSK test program the next time WinNT is ramped up.

4.3 Backing up/restoring data with a TCU configuration

Application

If a configuration contains one or more TCUs, data backup/restoration cannot be carried out with service programs on the DOS level.

This is why the SINUMERIK desktop (Windows XP) provides a link to the "ServiceCenter" program. The backup/restore functions are carried out here, as when they are called in DOS, e.g., creating an image, restoring, marking as an emergency image, etc.

Overview

Double-clicking on "ServiceCenter" opens the selection box below:
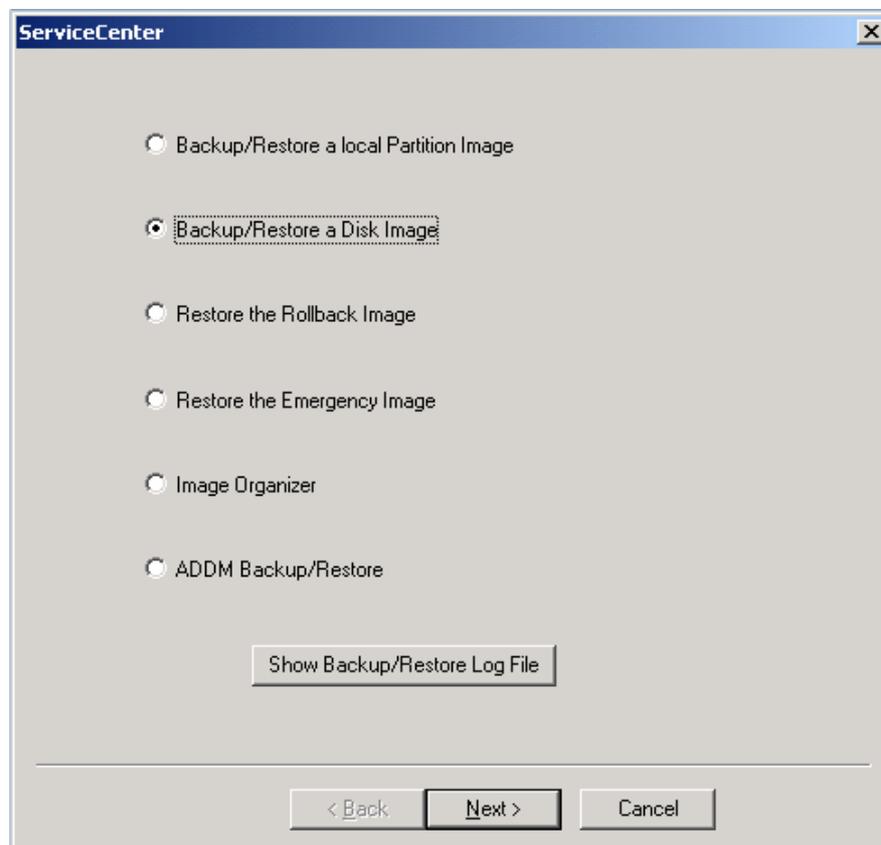
Fig. 4-9: Data backup and restore selection box

Backup/Restore a local Partition Image

Select this option to create or restore an image of one or more partitions locally on partition D.

"Next >" opens the next selection box, where you can select partitions C, E or F individually. If you wish to save the backup and restore it later, we recommend that you create a complete image (C, E and F).

The size of every partition is displayed before you start the backup process. In order to retain suitable data packets for archiving on a CD-ROM, for example, you can also define the desired sizes under "Options".

Backup/Restore a Disk Image

Select this option to create or restore an image of one or more partitions <u>on a network drive</u>.

"Next >" opens the next selection box: If you have already established a network connection with access to a shared drive, select "Net Share" and enter the drive name and the file name.

- You can reset the communication parameters under "Change Network Settings".

- Under "Options", select either one backup file or several data packets and define the appropriate sizes.

A connection is established using the "Ghost Cast Client" Ghost software (with a 1:1 connection, for example). To implement this, licensed Ghost software must be installed on the target drive.
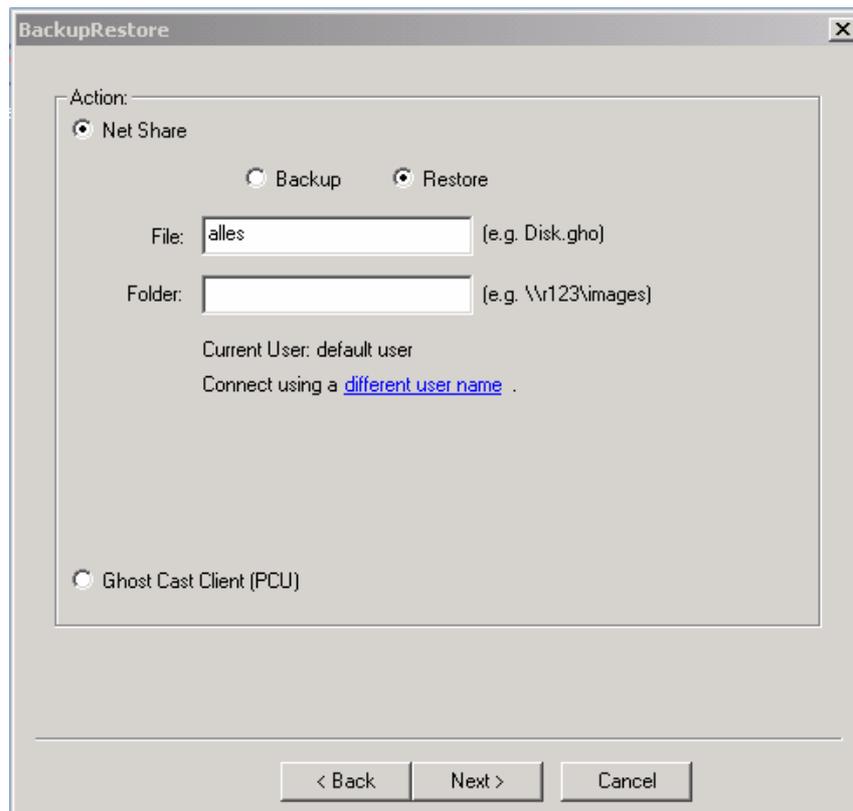
Fig. 4-10: Network drive selection box

Restore the Rollback Image

Select this option to restore a rollback image (the most recently backed up/newest image of partitions C, E and F).

Restore the Emergency Image

Select this option to restore the emergency image of one or more partitions. This image is intended for use when the system can no longer be booted after a system crash or uncontrolled shutdown and, therefore, comprises partitions C and E.

This image must not impair the execution of installed applications, i.e., the registry entries for all applications installed on F: must be included in the image.

Use the "Image Organizer" function to mark the emergency image.

Image Organizer

Select this option to mark out one image contained in the displayed list as the emergency image, or to delete an existing image.

ADDM Backup/Restore

Select this option to create or restore an image of the ADDM (A & D data management) software on partition D or on a network drive.

Show Backup/Restore Log File

This option opens file bacres.txt, which contains a log of all backup records.

Outputting the log file (*Service menu "Actionlog" function)*

The log file can be read out from the ramp-up menu. A ramp-up menu is displayed whenever a crash event occurs (PLC bit DB19, byte0, bit6). The bit is set and canceled by the PLC on the user interface (as is key disable, screen blanking, etc.).

The function is executed as described in /IM4/.

■

I Index

I.1 Subject index

I.2 Index of commands and identifiers

■

SINUMERIK 840D sl

Commissioning CNC Part 5 (Basic Software)

Commissioning Operating System NCU sl (IM7)

Valid for

Control
SINUMERIK 840D sl / 840DE sl

Software   *Software version*
System software   1.3

Contents

■

1

1 Commissioning a System

1.1 System booting

Overview

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 signalize, 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 in a service case

For service or diagnosis purposes, the NCU can be booted from a service system, the Emergency Boot System.

For details, see Chapter 3 "Backing up and Restoring Data".

1.2 Displays during system booting

Overview

Of the LEDs on the front of the NCU, only the RDY LED and its status is important when booting up the NCU.

1.2.1 States of the RDY LED

BIOS booting

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.

Loading the 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.

1.2.2 System errors

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.

1.3 Meaning of the 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.
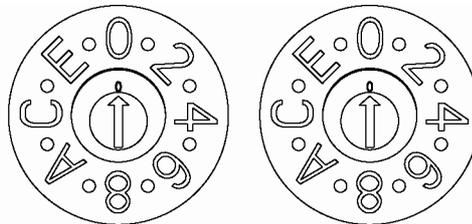
Fig. 1-1: Startup and mode selector switch

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 7-segment display.
All others	Not applicable

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 applicable

1.4 Directory structure and access rights

Preset users

The following users are already set up on the operating system of the NCU:

User	Password	
operator	---	Key switch position 0
operator1	---	Key switch position 1
operator2	---	Key switch position 2
operator3	---	Key switch position 3
user	CUSTOMER	Operators, users
service	EVENING	Service personnel
manufact	SUNRISE	Machine manufacturer

The users are case sensitive!
For more information, see Section 4.2 "Authorizations".

Directories on the CF card

When the NCU is in operation, the following directories are available on the CF card (this is a selection and not an exhaustive list):

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	– Storage of user data – Configuration of the HMI – Data that appears 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 data
/var/log/messages	System log file (same as event.log under Windows)

Priorities

Files in the directory under /user always have priority over files with the same name in the directory /oem → /addon → /siemens.

Caution

In most Linux system files, lines may only be ended with LF, and not with CRLF as in Windows. Bear this in mind 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.
Note that the Linux operating system is case sensitive.

■

2

2 Configuring Network Operation

2.1 Ethernet interfaces on the NCU

Use

The following connections can be established via the Ethernet interfaces:

Interface	Labeling	Internal name	Connection – settings
Ethernet (HMI) IE1/OP	X120	(eth0)	Connection to the system network with fixed IP address 292.168.214.1 and fixed subnet screen form 255.255.255.0 with active DHCP server
Ethernet IE2/NET	X130	(eth1)	Connection to company network as standard DHCP client
Ethernet (PLC)	X127	(ibn0)	Service connection with fixed IP address 192.168.215.1 and fixed subnet screen form 255.255.255.224 with active DHCP server

For more information and details, see /IM5/ "Inbetriebnahme TCU".

2.2 Configuring network operation

The file basesys.ini is the central location for settings on the basic system (Linux). The original file is stored on the CF card under the path /system/usr/etc; OEM versions are stored under /oem/system/etc, and user versions are stored under /user/system/etc.

Note

Only the entries stored in this chapter in the file basesys.ini can be changed. An example file 'basesys.ini' is included in the appendix.

Entries in the file 'basesys.ini'

The file basesys.ini has the same theoretical structure as the Windows-ini files. Comments are introduced by ';' or '#' at the beginning of the line, and span the width of the line. Empty lines are also handled as comments.

The sections that start with a "[NAME]" line, as in Windows, are ignored by the basic system itself, but are sometimes used by the HMI.

Variable definitions are written in the form "NAME=VALUE". Blanks are permitted around the '=' character. The value may also be enclosed in double quotation marks, but this is optional.

2.2.1 Section [External interface]

In this section, the parameters and settings for the external Ethernet interface are defined. For an NCU7x0, this is X130 (eth1). If the external interface is in DHCP mode, i.e. the value of ExternalIP is empty or not defined, then all parameters listed here, with the exception of 'DHCPClientID', are accepted by the DHCP server as long as the server provides a value for the parameter.

ExternalIP

If ExternalIP is not empty, the fixed IP address specified there is used on the company network interface. The ExternalNetMask then also needs to be set, as well as the gateway, name servers, host name and domain if required.

If ExternalIP is not set or is empty, a DHCP client is started on the interface.

Value:	IP address
Default:	Empty

ExternalNetMask

ExternalNetMask must be set together with ExternalIP, in order to define the size of the network.

Value:	Subnet Mask
Default:	Empty

Gateway

If the value of Gateway is not empty, the host specified there is used as the default gateway, which means that all IP packages that cannot be directly assigned are sent here for routing.

If no gateway is specified, only the networks that are directly connected are accessible.

Value:	IP address
Default:	Empty

Name servers

If DNS name servers are specified here, these are used for resolution of symbolic host names. In most positions at which an IP address is expected, a server name can also be used.

The name server setting is also sent to your DHCP client (TCU, PG) via the DHCP server of the NCU, so that this can also work with symbolic names.

Value:	List of IP addresses (separated by a blank)
Default:	Empty

Domain

These variables can be used to configure the DNS domain. Currently, the only practical effect is that names in this domain can be resolved without qualification. (e.g.: if the domain is "test.local", instead of the name "rechner1.test.local", you can also write "rechner1".)

Value:	Name
Default:	Empty

Host name

Here you can define a name for the local host. This manually assigned name has priority above all other names.

The host name is determined in the following order:
- Host name from the basesys.ini, if set
- A name received from the DHCP server (if the DHCP client mode and a name are supplied)
- The result of a reverse DNS lookup, i.e., which names belong to the IP address that you received (if name servers are defined)
- A default name ("NONAME_...")

Value:	Name
Default:	Empty

DHCPClientID

With these variables, you can influence which ClientID the DHCP client presents to its server. This ID can be used by the server to assign certain parameters to the client, for example a static IP address.

Usually, the MAC address of the Ethernet interface is used for this purpose. This is also the default setting. Alternatively, you can also use the host name ("@NAME"), which must then be defined in the basesys.ini, in order to be recognized before the DHCP request. It is also possible to use an arbitrary string for ClientID.

Value:	@MAC, @NAME, or any string
Default:	@MAC

EnableCoreDumps

If this variable is set as equal to 1, a log file for processes is created and stored under /var/tmp. The protocol file contains a memory expression for the process that has stopped or terminated.

Value:	Empty, 0 or 1
Default:	0

2.2.2 Section [LinuxBase]

Time zone

The time zone set here is used by the system to convert UTC time into local time. The time zone is also sent to all applications via the environment variable TZ, and is taken into account by the libc function localtime().

The time zone influences all time entries in the basic system, particularly for the command 'date', for ls –l, and in the system log file (on the CF card under /var/log/messages).

Value:	Time zone description
Default:	UTC

Some selected time zone descriptions are listed in the comments of the supplied example file basesys.ini (see appendix):

```
Europe:    WET0WEST,M3.5.0,M10.5.0
           CET-1CEST,M3.5.0,M10.5.0
           EET-2EEST,M3.5.0,M10.5.0
USA:       EST5EDT,M4.1.0,M10.5.0
           CST6CDT,M4.1.0,M10.5.0
           MST7MDT,M4.1.0,M10.5.0
           PST8PDT,M4.1.0,M10.5.0
China:     CST-8
Japan:     JST-9
```

■

Notes

3

3 Backing Up and Restoring Data

3.1 Use cases

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 PCU50.3 or programming device (PD):
        the service shell can be called under Linux or alternatively also under
        Windows via WinSCP.

For additional information about network configurations, see also:
/IM5/ TCU Installation and Start-Up, "Configuring Network Operation (SINUMERIK solution line)".

3.2 Create service system

Purpose

A bootable service system is created on a USB storage medium. The service system is also called the "Emergency Boot System" or EBS.

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 FAT32 partition for DOS or Windows applications.

The FAT32 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
- a file with the newest information siemensd.txt

Recommendation:
Preferably, the SIMATIC PC USB-FlashDrive with 512 MB storage capacity should be used.

Notes

- 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.

Procedure

To create a service system on a USB storage medium:

1. Copy the service system onto a local hard disk of your programming device (PD) or PC.
2. Connect a 512 MB USB storage medium to the USB interface of the PD or 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 FAT32 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.

3.3 Backing up/restoring data with the service system

3.3.1 Backing up data onto a service system

Procedure

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 and the main menu is displayed:
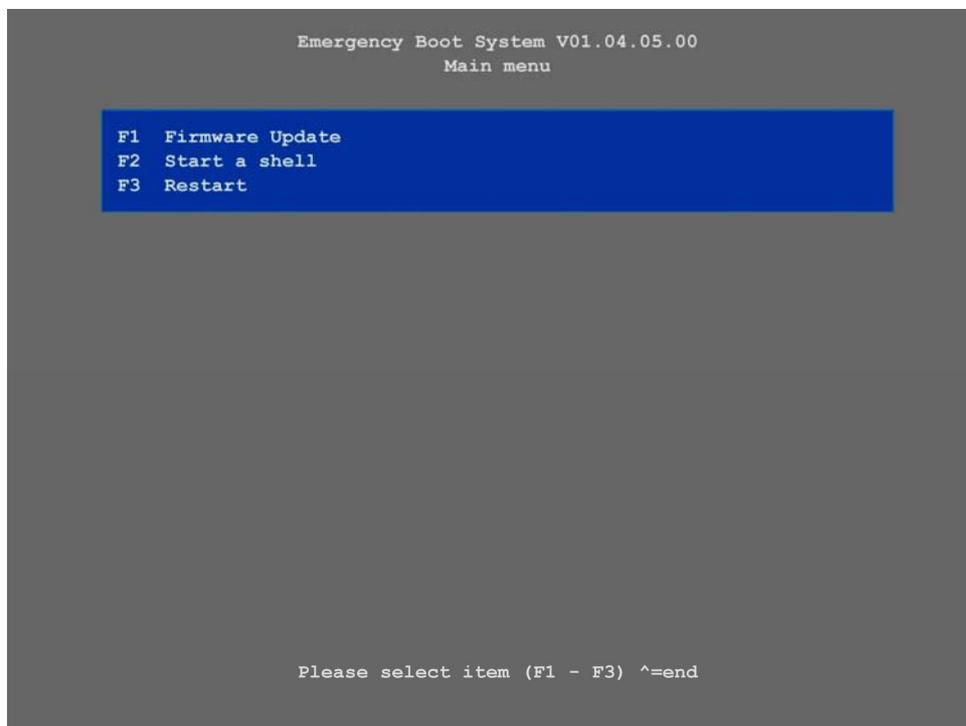
2. Select <F2> (softkey or button on an external keyboard) to open a service shell.
3. Log on as a service technician using the user name 'manufact' and password 'SUNRISE'.
4. Using the command 'sc backup,' create the backup file 'backup01.'

    The directory /data on the service system is provided for backup files. Choose between **–full,** to save all data to the CF card, or **–user**, if you only want to save user data in the directory /user.

    Example: **sc backup –full /data/backup01**

    Result:

A backup file of the complete CF card is created under /data on the service system.

3.3.2 Restoring data from the service system

Procedure

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' write the backup file 'backup01' from the service system back to the CF card in the NCU.

   Example: `sc restore /data/backup01`

   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.'

3.4 Backing up/restoring data on a network

3.4.1 Backing up data onto a network drive

Sequence

Proceed as follows:

- Establish a connection to a network drive
- Define a MOUNTPOINT
- Create a backup file

Scenario I: start command shell under Linux

1. Using the key combination <Recall + Menu select> (area switchover key), switch to VNC Starter: A list of available VNC connections is displayed (see the diagram below):
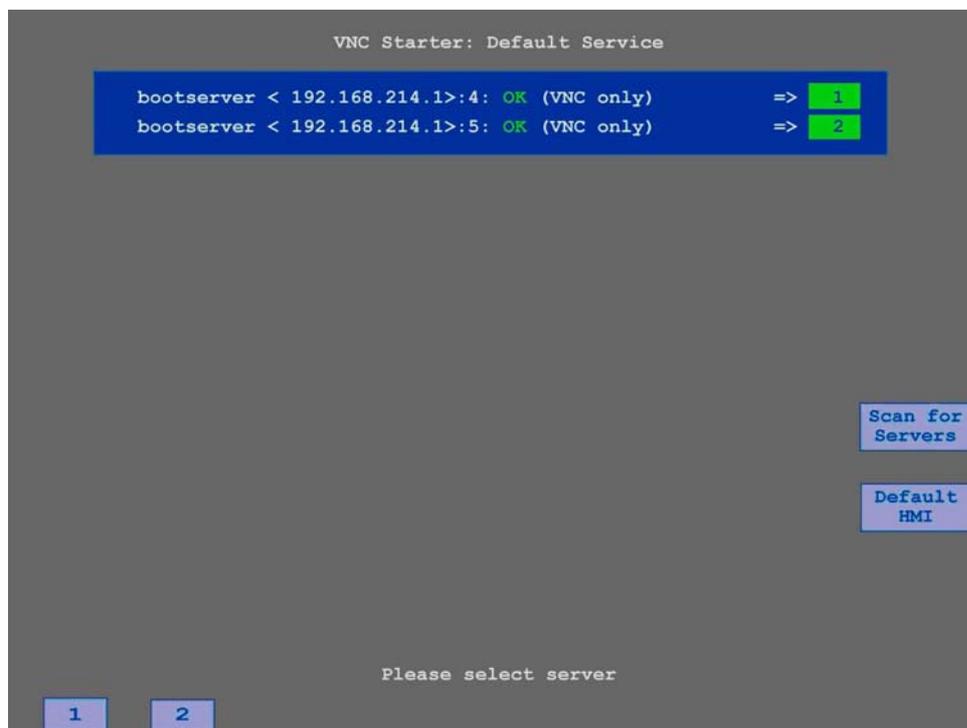
2. Start a service shell by using the assigned softkey to select 'Session 4'. In 'Session 5', the log console is output. (superset for system log file under /var/log/messages.)
3. Log on as a service technician using the user name 'manufact' and password 'SUNRISE'.
4. Create a new directory 'backup' under /tmp on the CF card, which you will then use as **MOUNTPOINT**.
   Example: `mkdir /tmp/backup`

5. Use the command 'sc connect' to connect the network drive:

`sc connect //`username`%`password`@`server/share `/tmp/backup`

Here, enter the user name and password for the network drive that is to be connected here (for additional details about syntax, see also chapter "Service Commands").

6. Using the command 'sc save,' create the backup file 'backup01.'

Choose between `–full,` to save all data to 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 PD

1. Start WinSCP and enter the following data in the log-on window:
   – Host name of the NCU or IP address
   – Use name 'manufact' with password 'SUNRISE'.
2. In the menu, choose "Commands" → "Open Terminal".
3. Perform the data backup using the commands described in steps 4 to 6 from scenario 1.

3.4.2 Restoring data from a 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:

   Using the key combination <Recall + Menu select> (area switchover key), switch to VNC Starter: A list of VNC connections that can be selected is displayed.

2. Start a service shell by using the assigned softkey to select 'Session 4'. In 'Session 5', the log console is output.

3. Log on as a service technician using the user name 'manufact' and password 'SUNRISE'.

    sc stop all

    Use the command 'sc connect' to connect the network drive:

    sc connect //username%password@server/share **/tmp/backup**

    Here, enter the user name and password for the network drive that is to be connected here (for additional details about syntax, see also chapter "Service Commands").

4. To completely restore the system (system data and user data), enter the following:

    sc restore –full backup01

    Result: The whole system is overwritten with the backup data.

    To restore user data only, enter the following command:

    sc restore –user backup01

    Result: The user data is restored to its former status.

5. 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 PD:

1. Start WinSCP and enter the following data in the log-on window:
    –   Host name of the NCU or IP address
    –   Use name 'manufact' with password 'SUNRISE'.
2. In the menu, choose "Commands" → "Open Terminal".
3. To restore the data, enter the corresponding commands as described under steps 3 to 5 in scenario 1.

■

4

4 Service Commands

SINUMERIK 840D sl/840D/840Di/810D Commissioning Basic Software (IAM2) – 08/2005 Edition   IM7/4-25

4.1 Application

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 service USB memory.) However, some actions are only useful in one of the two systems (NCU/Service). This is noted for each action.

Note

The most important terms and abbreviations are explained in the appendix under "Explanation of Terms".

4.2 Authorizations

The 'sc' command can execute its actions using more authorizations than are normally granted to the calling user. For example, starting or stopping subsystems requires root authorizations, but 'sc' allows every user who belongs to the 'service' group to do this.

Each action of 'sc' is assigned an "authorization level". This is a user group to which the caller 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 authorization level 'service'.

The authorization level that the caller requires is noted for each individual action. The possible levels are (in ascending order):
- None
- operator
- user
- service
- manufact

This means that an action with the authorization level 'user' can also always be executed by members of the groups 'service' and 'manufact'. Actions with authorization level 'none' can be called by all users.

If a user does not have the required authorizations, the following error message is output:

```
Action 'ACTION' needs at least GROUP privilege level.
```

4.3 Syntax for the actions

'sc' in the command line is essentially <u>not</u> case-sensitive.

The following entries are therefore interpreted as identical:
```
sc help show
SC help SHOW
sc HeLp sHoW
```

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
  ```

4.4 Actions

4.4.1 Help

Syntax:	sc help [ACTION]
Alternative names:	-h, - -help
Authorization 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 CFSes 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'.
```

4.4.2 Check-cf

Syntax:	sc check-cf
Alternative names:	checkcf
Authorization 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.

4.4.3 Restart

Syntax: sc restart
Alternative names: reboot
Authorization 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'.

4.4.4 Enable, disable

Syntax: sc enable hmi|nck|SUBSYSTEM ...
                        sc enable DHCPSvr -INTERFACE
                        sc disable hmi|nck|SUBSYSTEM ...
                        sc disable DHCPSvr -INTERFACE
Authorization level: service

The action 'enable' switches on the specified subsystems so that these are also activated when the subsystem is started. Similarly, 'disable' switches off subsystems. These subsystems are then not loaded again at the next restart.

'hmi', 'nck' or any other subsystem names can be used for the subsystems. You can also switch several subsystems on/off using an 'enable'/'disable' command.

The name 'DHCPSvr' is a special case. This does not switch a normal subsystem on or off, but specifies whether or not a DHCP server should be started on a network interface. The interface is entered in the standard form.

The actions 'enable' and 'disable' function by changing certain variables in the file /user/system/etc/basesys.ini . In subsystems, this variable is 'DisableSubsystems', in DHCPSvr 'DisableDHCPD<INTERFACE>'. You can therefore also achieve the same effect by manually editing the basesys.ini file.

4.4.5 Show

Syntax:	sc show ip [-INTERFACE]
	sc show drives SERVER
Authorization level:	None

Under the action 'show', various displays are grouped together showing the status of the system in the form of subactions. As these are barely related to each other, they are handled separately.

show ip

Syntax:	sc show ip [-INTERFACE]
Authorization 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 (eth0):
 configured: (default)
 current   : IP=192.168.214.1   Netmask=255.255.255.0
                                 MAC=08:00:06:73:28:76


X130 (eth1):
 configured: DHCP
 current   : IP=157.163.247.201 Netmask=255.255.254.0
                                 MAC=08:00:06:73:28:77

X127 (ibn0):
  current   : IP=192.168.215.249 Netmask=255.255.255.248
                                 MAC=08:00:06:73:28:78

Default gateway: 157.163.246.1 (via eth1)
```

The following data is displayed for each interface:

- Name: the names of the connection socket (X1xx), 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 current IP address together with the network screen form and MAC address of the interface.

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
Authorization 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:

```
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.

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.

Connection to SMB servers usually requires the entry of a user name (with domain,
if applicable) and a password.

4.4.6 Start, stop

Syntax:	sc start all|system|SUBSYSTEM...
	sc start all|system|SUBSYSTEM...
Authorization 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

Both of these actions have only been implemented to a restricted extent!
Only "all" and "system" function, but not arbitrary subsystems.

'hmi', 'nck' or any other subsystem 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.

4.4.7 Save

Syntax:	sc save [-full|-user] [-force] FILENAME
Alternative names:	backup
Authorization level:	user

The action "save" or "backup" creates a backup of the controller 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.

There are two variants of the backup:

- Full backup (option "-full", default)
  includes all files of the controller incl. Boot Loader

- User data only (option "-user")
  only files under the path /user of the controller

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
Writing /user-only backup to /tmp/drv01/backup  78 kB (uncompressed)
done
```

4.4.8 Restore

Syntax: sc restore [-full|-user] [-force] [-nodelete] FILENAME
Authorization level: user

A backup created using "sc save" can be restored to the controller using "sc restore".

In this case, the following restrictions apply:

- A user data backup can be restored directly on the controller (without service system), but only if no subsystems are running (if necessary, these should be stopped previously using "sc stop all".) In all other cases, the backup must be restored from a service system.

- If no options are specified, all files saved in the backup are simply restored. If the backup was a user data backup, only the user data is replaced and the rest of the system remains unchanged. For a full backup, you can use the option "-user" to restore only the user data (which is also included in the full backup).

- In contrast to "sc save", the option "-full" does not stand for a full backup. Instead, this means that as well as restoring the files, the file system is also recreated and the boot loader is reinstalled. "-full" is required if the CF card of the controller is empty or the file system there is seriously damaged.

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".

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.

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.

4.4.9 Connect

Syntax: sc connect [-ro] SERVER:/PATH [MOUNTPOINT]
                     sc connect [-ro] [-public] //[USERNAME[/DOMAIN]
                     [%PASSWORD]@]SERVER/SHARE [MOUNTPOINT]
Alternative names: mount
Authorization level: user

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 specifications, use the forward slash "/" and not the backslash "\".

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 section is therefore   //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.

  After the entry of the remote file system, you can also specify the required directory ('MOUNTPOINT') in which the remote files will become visible locally. This should be an empty directory to which you have write access. If MOUNTPOINT is omitted, 'sc' itself generates a suitable directory. The name is /tmp/drvNN (numbered consecutively), and is displayed when the connection is successful.

  The option "-ro" connects the remote file system in read-only mode, which means that you can only read and do not have write access. This can be useful if you want to exclude changes that originate from the controller, or if the server only allows read-only connections.

  As explained above, an SMB file system is connected as the specified user. To prevent a third user from executing file operations on the controller in the name of the connected user, the local directory can normally only be accessed by the latter (and all members of the same group).

  However, if you do want to make the remote directory available to further local users, you can use the option "-public" to make the MOUNTPOINT belong to the "operator" group, and this access is therefore guaranteed.

4.4.10 Disconnect

Syntax:	sc disconnect MOUNTPOINT
	sc disconnect -all
Alternative names:	umount, unmount
Authorization level:	user

The action "disconnect" terminates the connection to a remote file system previously connected using "connect". If the MOUNTPOINT has been automatically created by 'sc', the corresponding directory is also deleted again.

The variant "sc disconnect -all" can be used to remove all existing SMB and NFS file systems.

4.5 Generic elements

This sections describes the syntax elements that are used by several actions.

4.5.1 Interfaces

The names of network interfaces are used, for example, by "sc show ip", "sc set ip" and "sc enable DHCPSvr".

As the input of an interface is sometimes optional, it is always introduced with 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", "eth0", "tcu", "intern"
- Company network port   "X130", "eth1", "factory", "extern
- IBN port   "X127", "ibn0", "pg"

4.5.2 Names of subsystems

Subsystem names are entered, for example, when using "sc enable" and "sc start".

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.

4.6 Service Tools WinSCP and PuTTY

Purpose

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 Basic Software Thin Client for PCU 50 V07.05.00.00 and higher'. With a PCU 50.3, this package is pre-installed. WinSCP and PuTTY are offered as options during installation of the HMI-Advanced on PC or PD.

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.

Operating via PCU 50

WinSCP is started from Windows after the service technician has logged onto the NCU with which they are connected with the corresponding authorization (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 chapter "Backing up and restoring data")

■

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A

A Appendix

A.1 Example of the file basesys.ini

The supplied template for the basesys.ini is as follows:

```
--------------------------------------------------------------------------------
; Default Linux basesystem configuration
; -------------------------------------
;
; section ID is for Windows compatibility and is ignored ;)
[ExternalInterface]

; If ExternalIP is set, you can force the external Ethernet interface to use
; a fixed IP addr. etc instead of using DHCP
; if a Hostname is set, it even overrides one received by DHCP
;ExternalIP=210.210.210.210
;ExternalNetMask=255.255.255.0
;Gateway=210.210.210.1
;Nameservers=210.210.210.1 210.210.210.2
;Timeservers=210.210.210.3
;Hostname=somename
;Domain=example.com

; if ExternalIP is empty (default), DHCP is used with the following ClientID
; the default is "@MAC" to use the MAC address, alternatives are "@NAME" to use
; the hostname (Hostname above) or any other arbitrary string
;DHCPClientID=@MAC

[InternalInterface]
; With InternalIP and InternalNetMask (both must be set together),
; you can change the address on the internal/TCU/automation net. This should
; not be needed normally
;InternalIP=192.168.214.1
;InternalNetMask=255.255.255.0
```

```
; This is the range of dynamic IPs given out by the DHCP server
; Defaults should be sensible
;InternalDynRangeStart=192.168.214.10
;InternalDynRangeEnd=192.168.214.240

[LinuxBase]
; Keep size of /var/log/messages around this value (not followed exactly for
; performance reasons)
LogfileLimit=102400

; Protocol/Port pairs to open in the firewall (e.g., TCP/5900, UDP/514, ...)
;FirewallOpenPorts=TCP/5900

; If there is only one Ethernet interface, it's used by default as an external
; (company) network. Alternatively, usage as automation net (TCU boot support
; etc.) is possible by setting NetworkModel to "automation". (Only NCU,
; Service, and PCU20A variants!)
;NetworkModel=automation

; DisableSubsystems can be used to skip certain CFSes (= subsystems)
; a list of multiple names (separated by spaces) is possible
; a simple name means all CFSes with this name, an absolute path (e.g.,
; /siemens/sinumerik/nck) exactly this one CFS
; with the special value "ALL", all subsystems can be disabled
;DisableSubsystems=nck

; Setting DisableDHCPD<INTERFACE> to 1 suppresses that a DHCP server is
; started on that interface
;DisableDHCPDeth0=1
;DisableDHCPDibn0=1
```

```
; Properties of local time zone: names, offset, start and end day
; Some examples:
;   Europe: WET0WEST,M3.5.0,M10.5.0
;           CET-1CEST,M3.5.0,M10.5.0
;           EET-2EEST,M3.5.0,M10.5.0
;   USA:    EST5EDT,M4.1.0,M10.5.0
;           CST6CDT,M4.1.0,M10.5.0
;           MST7MDT,M4.1.0,M10.5.0
;           PST8PDT,M4.1.0,M10.5.0
;   China:  CST-8
;   Japan:  JST-9
Timezone=UTC
--------------------------------------------------------------------------------
```


A.2 Example configuration with fixed IP address

```
--------------------------------------------------------------------------------
[ExternalInterface]
ExternalIP=10.10.20.21
ExternalNetMask=255.255.0.0
Gateway=10.10.1.1
Nameservers=10.10.1.1 10.11.1.1
Timeservers=ntp.test.com
Hostname=NCU3
Domain=test.com

; if ExternalIP is empty (default), DHCP is used with the following ClientID
; the default is "@MAC" to use the MAC address, alternatives are "@NAME" to use
; the hostname (Hostname above) or any other arbitrary string
;DHCPClientID=@MAC

[LinuxBase]
LogfileLimit=102400
Timezone=CET-1CEST,M3.5.0,M10.5.0
--------------------------------------------------------------------------------
```

A.3 Explanation of terms

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. In most cases an interface of this type is an Ethernet port.

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 authorization 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 at runtime, for example. 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 software that displays the screen contents of a remote computer that is running a **VNC server** on a local computer that is running a VNC viewer and in return sends keyboard and mouse movements of the local computer to the remote computer.

A.4 Licenses for WinSCP and PuTTY

License texts

WinSCP: Copyright © 2000-2005 Martin Přikryl. The application is protected by
           GNU General Public Licence.
           Part of the code of this software comes from program PuTTY 0.58
           © 1997-2005 Simon Tatham. License agreements for using PuTTY
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PuTTYgen and Pageant applications distributed with WinSCP installation package
           are © 1997-2005 Simon Tatham.

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■

I Index

I.1 Subject index

I.2 Index of commands and identifiers

■

IIM7/ -52   SINUMERIK 840D sl/840D/840Di/810D Commissioning Basic Software (IAM2) – 08/2005 Edition

SINUMERIK 840D sl

Commissioning CNC Part 5 (Basic Software)

Commissioning PCU Basic Software (IM8)

Valid for

PLC
SINUMERIK 840D sl/840DE sl

software	*IM8/Software version*
PCU basic software	IM8/8.0

Contents

1

1 Commissioning a System

1.1 Delivery condition of the system

Overview

The powerful SINUMERIK PCU 50.3 not only has an integrated 150 W main power section but also all of the interfaces for communication via Ethernet and PROFIBUS DP already on board. The SINUMERIK PCU 50.3 is supplied with an operating system based on Windows XP.

Interfaces:

- Four high-speed USB ports (USB 2.0) offer points where a keyboard, mouse and other peripheral devices can be connected.
- A covered slot is available for CF cards.
- Two internal PCI slots are available for specific expansions.

  (Depending on the device version, one slot may be occupied.)

Two 7-segment displays and/or LEDs are integrated for diagnostic purposes. These indicate the current operational state and the BIOS error codes while booting up.

References: /BH/, Operator Components Manual
This includes the description of how the components PCU 50.3 are exchanged.
/BU/NC 60 ordering documentation:
Each current catalog specifies the combinations that can be delivered.

1.1.1 Partitioning the hard disk

Division of the hard disk

The hard-disk partitioning corresponds to the grouping that is required for installing the HMI system software onto the PCU using Windows XP.

- 3 primary partitions and 1 expanded partition are created
- Windows XP with HMI system software
- Depending on the order details, the HMI system software may be pre-loaded on delivery. It is installed subsequently by the customer the first time the system is ramped up.
- To ensure data integrity, the HMI system software and the Windows XP system software are distributed to different partitions.

The hard disk of the PCU with 40 GByte memory capacity is divided into in a primary partition C and an expanded partition with the three logical drives D, E, and F; each work with NTFS file access.

The following illustration shows how the PCU partitions are used:
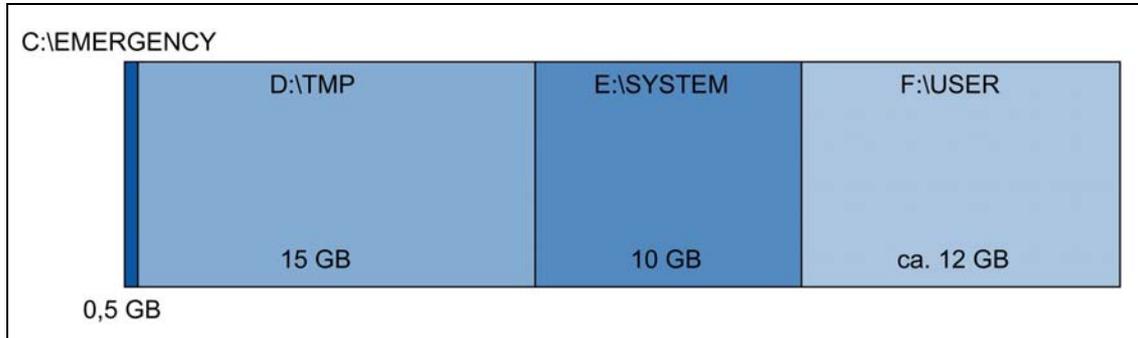
Fig. 1-1:   Division of the hard disk

Content of the partitions

The individual partitions are intended for the following data or are already loaded with this data:

Partition C	Partition C is reserved for service tasks in WinPE 2005.
Partition D	Partition D is used for Ghost images, i.e., stored images (e.g., those supplied with the system) and local backup images.
	Partition D also contains the installation directory where the software to be installed is first copied to from a remote PG/PC, prior to the actual installation procedure.
Partition E	Partition E is reserved for the Windows XP software.
	The Windows XP software is available on the Recovery CD via the network for installing drivers, for example, or updates, if needed.
Partition F	Partition F is intended for installing operator programs: Applications such as HMI system software (including data storage and temporary data), STEP7, OEM applications for HMI, or customer-specific applications should be installed here.

Attention

We strongly recommend that you install all applications in Partition F only.

1.1.2 Software Enclosed on the PCU

The software installed on delivery of the PCU includes the components below, among others:

MS Windows XP Professional SP2	
Internet Explorer	V 6.0
Symantec Ghost *(default setting)*	V 8.2 *(*including Ghost Explorer)
TCU Support (is already installed <u>and</u> available on the hard disk at D:\Updates if re-installation is needed.)	V 8.0

Documentation for all Ghost tools is supplied on the PCU's hard disk under path E:\TOOLS.

Note

For the system component versions contained in the PCU basic software, see the *C:\BaseVers.txt* file.

System settings

For security reasons, Windows XP has been preset as follows:

- The Autorun function is deactivated.
- Automatic Windows Update is deactivated.
- Monitoring and alerts for antivirus software and automatic update are deactivated.
- Links used to call up Internet Explorer from the desktop and the Start menu are removed.
- Remote Procedure Call (RPC) is possible for calls that are not connected.
- The firewall settings are activated on the Ethernet 1 network card and deactivated on the Ethernet 2 network card.

Changes to Windows services

Other default settings:

Windows services:	Start-up type:	
Computer Browser	Manual	(Not started)
Error Reporting Service	Disabled	
Portable Media Serial Number	Manual	(Not started)
SSDP Discovery Service	Disabled	
Universal Plug and Play Host	Disabled	
Web Client	Manual	(Not started)
Wireless Zero Configuration	Manual	(Not started)

1.1.3 BIOS Settings

Overview

You can use BIOS setup to set the hardware configuration (for example, the hard disk type) and define the system properties. You can also use BIOS setup to set the time and date in the clock module.

Attention

Your device configuration is preset for working with the software supplied with the unit. You should only change the preset values if you have modified your unit in any way, or if a fault occurs when the unit is powered up.

Starting BIOS setup

Run the BIOS setup program as follows:

1. Reset the device (warm or cold restart).

    After the first boot test, the following message appears:

    Press <F2> to enter SETUP or <ESC> to show boot menu

2. Press the F2 key as long as the BIOS prompt appears on the screen.

    The BIOS main menu opens:
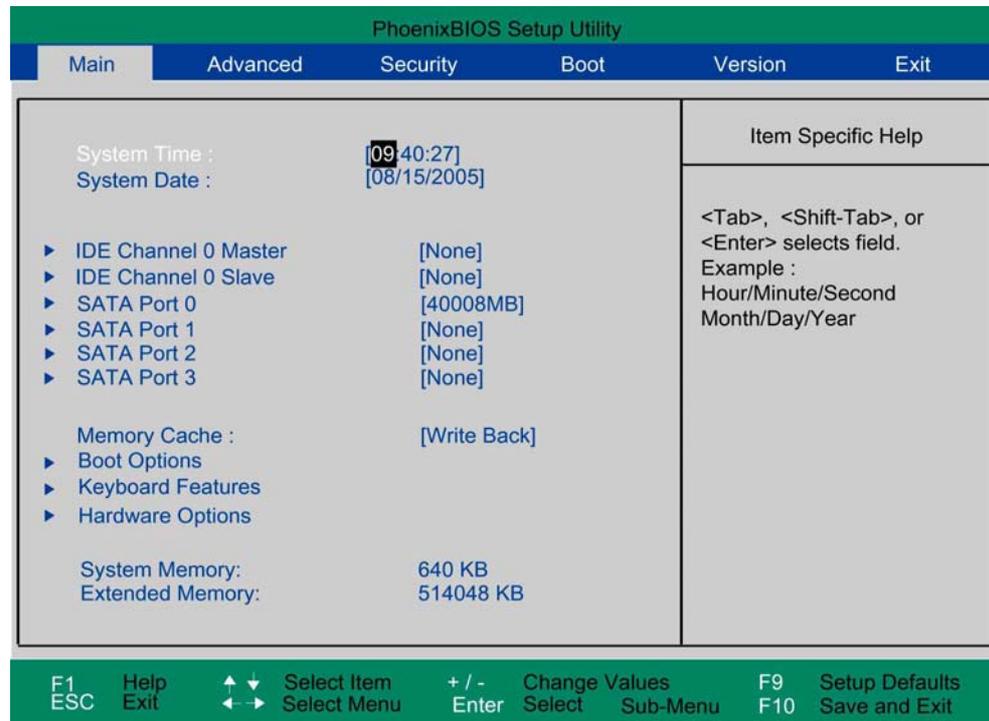
Figure 1-1: BIOS main menu (example)

BIOS setup Defaults

The system parameters below are saved on delivery:

Menu: Main

System parameters	Defaults	Custom entries
System Time	hh:mm:ss	
System date	MM/DD/YYYY	
IDE Channel 0 Master	None	
IDE Channel 0 Slave	None	
SATA Port 0	40008 MB	
SATA Port 1	None	
SATA Port 2	None	
SATA Port 3	None	
Memory cache	Write Back	
Boot options		
Quick boot mode	Enabled	
SETUP prompt	Enabled	
POST errors	All, but not keyboard	
Summary screen	Enabled	
Diagnostic screen	Enabled	
Post Code/Status	LPC Bus	
Keyboard features		
Numlock	ON	
Key click	Disabled	
Keyboard auto-repeat rate	30 / sec	
Keyboard auto-repeat delay	λ sec	
Hardware options		
PCI MPI/DP	Enabled	
On-board Ethernet 1	Enabled	
On-board Ethernet 1 Address	08 00 06 90 xx xx	
On-board Ethernet 1 Remote Boot	Enabled	
On-board Ethernet 2	Enabled	
On-board Ethernet 2 Address	08 00 06 90 xx xx	
On-board Ethernet 2 Remote Boot	Disabled	
SafeCard functions	Enabled	
Fan control	Enabled	
CRT/LCD selection	Simultan. Auto	

Menu: Advanced

System parameters	Defaults	Custom entries
Installed O/S	Other	
Reset configuration data	No	
Legacy USB support	Disabled	
USB controller restart	Enabled	
I/O Device Configuration		
Internal COM 1	Enabled	
Base I/O address	3F8	
Interrupt	IRQ 4	
PCI Configuration		
PCI device slot 1		
Option ROM scan	Enabled	
Enable master	Enabled	
Latency timer	Default	
PCI device slot 2		
Option ROM scan	Enabled	
Enable master	Enabled	
Latency timer	Default	
SATA/PATA Configuration		
PATA Controller:	Enabled	
SATA Controller mode	Enhanced	
AHCI Configuration	Disabled	
RAID support	Disabled	

Menu: Security

System parameters	Defaults	Custom entries
Supervisor password is	Disabled	
User password is	Disabled	
Set user password	Enter	
Set supervisor password	Enter	
Password on boot	Disabled	
Fixed disk boot sector	Normal	

Menu: Boot

System parameters	Defaults	Custom entries
Boot priority order:		
1: SATA0:	Fujitsu MHT2040BHTBD	
2: PCI BEV:	VIA BootAgent	
3:		
4:		
5:		
6:		
7:		
8:		
Excluded from boot order:		

Menu: Version

System parameters	Defaults
SIMATIC PC	SINUMERIK PCU50.3
BIOS version	V05.01.05
BIOS number	A5E00370214-ES005
MPI/DP firmware	V01
CPU type	Celeron ® M processor 1.50GHz
CPU ID	06D8
Code revision	0020

Menu: Exit

Save Changes & Exit   All changes are saved; a system restart is carried out with the new parameters.

Changing BIOS settings

Once additional components have been installed or attached, it may be the case that the system has to be informed of this via the BIOS setup:

1. Boot the device.
2. When the prompt to activate the BIOS setup appears, press the <F2> key (corresponds to horizontal softkey 2 on the OP). The BIOS setup menu appears.
3. In the menu, use the cursor keys to navigate to the desired selection box.
4. Change the setting using the + key (press <SHIFT> and <X> at the same time) or the ↔ key (on the numerical keypad).
5. If you wish, you can reach other setup menus using the right/left cursor keys.
6. Press <Escape> (<Alarm Cancel> key) to go to the "Exit" menu (or press the right cursor key again).
7. Press the <Enter> key to exit the setup menu.

The system then boots (see the Operator Components Manual).

Note

With the exception of the boot sequence and the LPT mode (EPP, EPC), an OEM contract must be concluded in order to make changes to the BIOS settings.

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1.2 Starting the system

In the production mode, booting an HMI system occurs in the following steps:

- Booting the Windows kernel with the display of the last valid background image

- Starting the log on process via Windows (WinLogon)

- Automatic log on of the service user

- Automatic start of the HMI Manager

The HMI manager first executes numerous functions in the boot, which consist of control functions (such as displaying the currently valid background image) and service functions (such as installing a product). It then starts the HMI program and closes.

Default users

When the system is delivered from the factory, the users below are defined:

User name	Password	User type
hmi		Local standard user (not implemented yet)
auduser	SUNRISE	The only service user
siemens	*****	Local administrator The password can be changed.

Preconfiguration of PCU 50.3

A PCU 50.3 has two Ethernet interfaces, which are properly preset for use with SINUMERIK solution line:
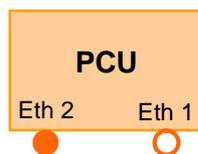
Eth 1 is preset as the standard DHCP client for the connection to a company network.

Eth 2 is preset as SINUMERIK DHCP server for connection to a system network. At Eth 2 the fixed IP address is 192.168.214.241.

A PCU 50.3 is properly preset for the connection to the automation network. The package 'PCU Basic Software Thin Client' is already included in the basic installation.

For details on setting the IP address:
→ see /IM5/ Commissioning TCU, chapter "Configuring a system"

Computer name of the PCU

When the system is delivered, a unique computer name is generated and can be read out at:
Start →Settings → Control Panel →Network on the "Identification" tab

1.3 Configuring HMI operators

Use

You can configure the nominated Windows operator under which the HMI system software is always started (= HMI operator). The local Windows user is the default HMI user "auduser".

Any other Windows user can also become the HMI user (instead of "auduser") if they are set up as a local Windows user or a domain user and possess administrator rights.

The registry entries below must be made in order to register as an HMI operator:

Reference				Default
	Key	HKLM\SOFTWARE\Siemens\SINUMERIK\Basic software\<*version*>\ HMI Manager		
User		Entry	HMIUserName (STRING)	auduser
Domain		Entry	HMIUserDomainName (STRING)	local

For the HMIUserDomainName you should enter:

for a domain operator: "<*domainname*>"
for a local operator: "**(**local**)**"

If the operator logs in as the (currently registered) HMI operator, the HMI system software starts automatically on booting. If the operator logs in as the HMI operator as another Windows operator, they are taken to the SINUMERIK desktop.

Auto logon

The operator does not usually have to log on explicitly, as the system is configured in such a way that the operator is logged on as the HMI operator automatically. Should the operator wish to log on as another Windows operator, they have to hold down the **Shift key** on the PS2 keyboard or an external USB keyboard (not possible on the OP keyboard) once the boot screen has appeared. The Windows **logon screen** then appears and the operator has to enter the name and password of the desired Windows operator.

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Notes

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2 Configuring a System

2

2.1 Configuring a system

Setting the IP address of the PCU 50.3

Note

For each PCU 50.3 in the system network, the IP address 192.168.214.241 is already preset at the factory.

For a PCU that is used as a DHCP server, the preset IP address 192.168.214.241 should not be changed.

Changing the IP address of the PCU is required for more than 2 PCUs in the network or if the IP address of the NCU has been changed to X120. If necessary, any changes to the IP address (in the area of 192.168.214.242 – 192.168.214.249) for the PCU are to be carried out **prior** to connecting it to the system network.

Connection via TCP/IP

A WINS server can be configured using TCP/IP. The DNS server and DNS extension are omitted. The WINS and gateway entries are also configurable with DHCP, and are displayed.

IP addresses can now also be entered with "." as a separator.

Note

WINS cannot be preassigned with "0 0 0 0", or the connection to subnets via DHCP will not work.

NFS client

The NFS client from "Windows Services for UNIX" is installed on E:\SFU\NFSCLIENT.

Changing the name of the PCU

You can change the name of the PCU at:
"Start" → "Settings" → "Control Panel" → "System" on the tab "Computer Name"
and press the "Change" button:
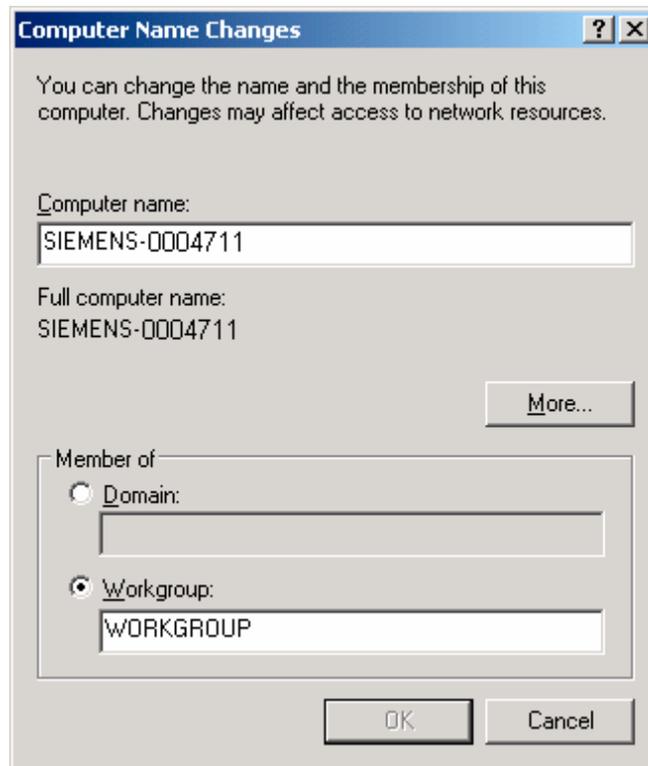
Fig. 2-1: Changing the name of the PCU

Also refer to the Chapter "Switching on the system" regarding the condition on delivery.

For details on setting the IP address and the name of the PCU:
→ see /IM5/ Commissioning Manual TCU

2.2 Configuring a customized user interface

2.2.1 Selecting the language for the Windows system

Default setting

Default language of your Windows XP MUI installation is English, with U.S. keyboard layout.

By using the Multi Language User Interface (MUI), you can convert Windows XP system menus and dialogs to a different language.

Select a language

The language conversion takes place via the Control Panel with the dialog "Start" → "Control Panel" → "Language and Regional Options" on the tab "Languages" in the selection box "Language used in menus and dialogs": Select the desired language.

At "Language and Regional Options", you should also set the standard for "Non-Unicode programs" on the tab "Advanced" in addition to setting the language for menus and dialogs.

2.2.2 Changing the background of the Windows desktop

Entries in the registry

The background pattern and image of the Windows desktop are not set via the Control Panel but in the registry:

Background pattern:

Key:	HKLM\SOFTWARE\Siemens\SINUMERIK\Basic software\ <version>\HMI desktop
Value:	Pattern (STRING)
Data:	"<bit code>" (e.g., "0 80 114 32 0 5 39 2", see HKCU\Control Panel\Patterns) "(None)" (= NO background pattern)
Init data:	Background pattern previously set via the Control Panel
Default data:	"(None)" (if entry is not available/readable)

Background image:

Key:	HKLM\SOFTWARE\Siemens\SINUMERIK\Basesoftware\<version>\ HMIDesktop
Value:	Bitmap (STRING)
Data:	"<path>" (e.g., "E:\WinNT.40\System32\Desktop.bmp") or "(StartupBitmap)" (the current boot screen is also the background image) or "(None)" (= NO background image)
Init data:	Background image previously set via the Control Panel
Default data:	"(None)" (if entry is not available/readable)

Note

An attempt to set the Windows desktop background (as in standard Windows) via
the Control Panel does not affect the desktop background display, but only the
boot screen display.

2.2.3 Storage location of HMI boot screen

Default setting

The Siemens boot screens are stored under the path below on the appropriate
PCU, e.g., for the SINUMERIK 840D controller:

```
F:\hmi_adv\ib\DATA\0\<Resolution>\0_1.bmp
```

A directory tree can also be created for manufacturer-specific boot screens. The
manufacturer's screens can then be saved in accordance with the schematic below:

Directory tree of manufacturer-specific boot screens:

```
F:\oem\ib\DATA\<NckType>\<Resolution>\<Name.bmp>
```

NckType stands for:	Default		Resolution:	640	(dpi)
	0	(840D)		800	
	2000	(810D)		1024	
	3000	(802D)			
	5000	(840Di)			

If you want the same screen to be used each time (NCU-independent screen), it
can be saved in the "default" directory in the required resolutions. If you want to be
able to use different screens for different NCUs, they should be saved in the
<NckType>\<Resolution> subdirectories using the appropriate resolution.

Screen name and resolution

<Name>.bmp : The name can be selected freely; only one file is permitted per
directory. The screens must be created with a graphics tool in the resolution
indicated by the subdirectory name and stored in the corresponding directory. The
HMI software selects the screen, depending on the NCK type and the resolution of
the available operator panel.

2.2.4 Displaying an in-house boot screen

Preconditions

Set up a directory containing several boot screens (for different panel resolutions). This directory should be segmented into subdirectories *640*, *800* and *1024*, which each contain a boot screen of the appropriate resolution.

A directory containing default boot screens can also be set up, likewise divided into subdirectories *640*, *800* and *1024*. The default boot screen stored there for a particular resolution is displayed if no boot screen (including one with a lower resolution) is found in the booting-screen directory described above.

If no default boot screen (including one with a lower resolution) is found, a general default boot screen is displayed, which is part of the PCU basic software.

Directories

The paths of the directories mentioned must be set in the registry:

Directory containing boot screens:

Key:	HKLM\SOFTWARE\Siemens\SINUMERIK\Basic software\ <version>\HMI Manager
Value:	BackgroundBitmapDir (STRING)
Data:	"<path>" (e.g., "E:\WinNT.40\System32\AppStartupBitmaps\1000\1") or "(None)" (= NO in-house boot screens)
Init data:	"(None)"
Default data:	"(None)" (if entry is not available/readable)

Directory containing default boot screens:

Key:	HKLM\SOFTWARE\Siemens\SINUMERIK\Basic software\ <version>\HMI Manager
Value:	DefaultBackgroundBitmapDir (STRING)
Data:	"<path>" (e.g., "E:\WinNT.40\System32\DefStartupBitmaps") or "(None)" (= NO default boot screens)
Init data:	"(None)"
Default data:	"(None)" (if entry is not available/readable)

2.3 Starting customized programs

2.3.1 Starting booting using an HMI application

If an HMI application, e.g., HMI Advanced, is to be started following booting, the settings and functionality differ from those that apply if the Windows desktop is to be started.

Starting an HMI application on booting

When the HMI application is exited, Windows NT shuts down completely. Keystroke sequences and function keys that were pressed simultaneously are then filtered. The keystroke sequences and functions that were pressed simultaneously and are to be filtered, can be configured in file *E:\WinNT.40\System.ini*.

Filtering keystroke sequences:

Section:	MMC103Keyb
Key:	SeqAct
Value:	<bit mask>
	(= keystroke sequences to be filtered, specified in accordance with the comment in E:\WinNT.40\System.ini)
Init value:	262143

Filtering function keys that were pressed simultaneously:

Section:	MMC103Keyb
Key:	ConcurrentKeyMask
Value:	<bit mask>
	(= function keys to be filtered, specified in accordance with the comment in E:\WinNT.40\System.ini)
Init value:	255

Windows Explorer runs in the background and its settings (browser functionality, taskbar, start menu, etc.) prevents the Windows platform being accessed unintentionally.

Starting HMI desktop after booting

Programs can be started at the same time as the HMI application and are started automatically by Windows when the HMI desktop is opened. This start in parallel to the HMI application can be configured.

Programs in Windows Startup directories in E:\WinNT.40\Profiles:

Key:	HKLM\SOFTWARE\Siemens\SINUMERIK\Basic software\ <version>\HMI Manager
Value:	StartSINHMIStartupDirsPrograms (DWORD)
Data:	1 (the programs are started) *or*
	0 (the programs are NOT started)
Init data:	0
Default data:	0 (if entry is not available/readable):

Programs in the registry entries
"HKCU\Software\Microsoft\Windows\CurrentVersion\Run" and
"HKLM\Software\Microsoft\Windows\CurrentVersion\Run":

Key:	HKLM\SOFTWARE\Siemens\SINUMERIK\Basic software\ <version>\HMI Manager
Value:	StartSINHMIRunPrograms (DWORD)
Data:	1 (the programs are started) *or*
	0 (the programs are NOT started)
Init data:	0
Default data:	0 (if entry is not available/readable)

2.3.2 Starting booting using the HMI desktop

When an HMI application started from the HMI desktop is exited, you are returned
to the HMI desktop. The keystroke sequences and function keys that are pressed
simultaneously are filtered as a function of the configuration in file
E:\WinNT.40\System.ini.

Filtering keystroke sequences:

Section:	MMC103Keyb
Key:	KeySequencesEnable
Value:	1 (= filtering of keystroke sequences specified in the SeqAct key) or
	0 (= NO filtering)
Init value:	0
Default value:	0 (if entry is not available/readable):

Key:	SeqAct
Value:	<bit mask>
	(= keystroke sequences to be filtered, specified in accordance with the comment in E:\WinNT.40\System.ini)
Init value:	262143

Filtering function keys that were pressed simultaneously:

Section:	MMC103Keyb
Key:	ConcurrentKeyEnable
Value:	1 (= filtering of function keys specified in the ConcurrentKeyMask key) or
	0 (= NO filtering)
Init value:	1
Default value:	0 (if entry is not available/readable)

Key:	ConcurrentKeyMask
Value:	<bit mask>
	(= function keys to be filtered, specified in accordance with the comment in E:\WinNT.40\System.ini)
Init value:	255

The Windows platform is freely accessible from the HMI desktop. When the HMI
desktop is started, all programs that standard Windows would start automatically
on login are also started.

2.3.3 Saving the settings for the HMI desktop

Default setting

The settings on the HMI desktop (such as, the arrangement of the links on the HMI desktop) are not saved when logging out.

A service technician should always find the same initial state on the HMI desktop, and not the settings from a previous session.

Saving settings

This behavior can be changed by making an entry in the registry. This registry entry is used to save the following settings:

- Moving and deleting links
- Positions of open windows
- Size and position of the menu bar

Saving the HMI desktop settings:

Key:	HKLM\SOFTWARE\Siemens\SINUMERIK\Basic software\ <version>\HMI Manager
Value:	SaveSINDesktopSettings (DWORD)
Data:	1 (HMI desktop settings are saved) or 0 (HMI desktop settings are NOT saved)
Init data:	- Value is not created by the basic software -
Default data:	(If entry is not available/readable): 0

The key is effective for all HMI users and all other users.

Links on the HMI desktop are always saved, irrespective of the registry entry.

Note

Application windows, which are still open prior to logging off, should be closed before exiting the HMI desktop if "Saving settings" is active. During a reboot, they are displayed briefly immediately before starting the HMI program and then closed again.

2.3.4 Starting OEM programs

You can start OEM programs directly before starting the HMI system software. This requires these programs (or their links) to be stored in subdirectories of the directory *C:\RunOEM*.

Sequence when starting

The subdirectories are executed in the order listed. The programs within a subdirectory are started in the chronological order in which they were placed in the subdirectory.

- Programs in the *C:\RunOEM\SeqOnce* subdirectory are started **once** and **sequentially**, i.e., a program is not started until the previously started program is completed.

- Programs in the *C:\RunOEM\Seq* subdirectory are started **sequentially whenever the system is ramped up**, i.e., a program is not started until the previously started program is completed.

- Programs in the *C:\RunOEM\ParOnce* subdirectory are started **once** and **simultaneously**. They run in parallel with the HMI system software.

- Programs in the *C:\RunOEM\Par* subdirectory are started **simultaneously whenever the system is ramped up**. They run in parallel with the HMI system software.

Not only program files, but also other types of file can be stored in the subdirectories, which are then opened in accordance with their file type.
For example, "*.txt*" files are opened using Notepad, "*.htm*" files are opened using Internet Explorer.

2.4 PCU 50.3 with SITOP UPSModule

Application

If the supply voltage to the PCU dips, the SITOP UPS modules may maintain operation for a limited period if a backup battery is being used, allowing the HMI to be properly shut down before the battery is exhausted.

The following UPS modules are permitted:

6EP1931-2DC41	6 A module with USB interface or
6EP1931-2EC41	15 A module with USB interface

Preconditions

- Windows XP PCU basic software, 08.00.00 or higher for USB interfaces
- HMI Advanced as of 07.01.00
- SITOP software, V2.5.2.4 or higher is installed:
  SITOP software is available for download from:
  http://www.ad.siemens.de/sitop
- SITOP monitor/configuration program is installed:

  To enable this, the SITOP software must be copied to the E:\SITOP directory set up on the PCU. This directory already contains PCU tools required for shutdown on the SITOP UPS. If this directory does not exist in an older version of the PCU basic software, it must be created so that it will be compatible for any subsequent updating of the PCU basic software.
- UPS USB driver for Windows XP is installed:

  Installation is described in the relevant SITOP documentation. The documentation is part of the SITOP software download package.
- The SITOP UPS hardware is connected.

Note

The "SITOP UPS" function has been tested in the standard configuration of HMI Advanced. When installing add-on or OEM software components, the shutdown procedure of the complete system has to be checked by the operator.

2.4.1 Starting and configuring the SITOP monitor

The SITOP monitor has to be started by Windows automatically during booting. A new value has to be entered for the SITOP monitor under the key below in the Windows registry:

```
HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Run
   ValueName: SITOP
   ValueType: REG_SZ
   Value Data: E:\SITOP\SITOP_DC_UPS.exe
```

A script file, sitop.reg, is located in the E:\SITOP directory. The required key is entered into the registry automatically if this file is executed.

The SITOP monitor is started automatically once the PCU is restarted. The next installation step is to configure the monitor.

Attention

The SITOP monitor must not be started via the Windows Autostart directory.

General settings

The following settings must be made in the SITOP-monitor configuration dialog box:

- Parameterization of the interface:
  for modules with USB interface USB
- Parameterization of the change action:
  The monitoring window display must be deselected, as this function can lead to sporadic faults on the HMI operator interface.
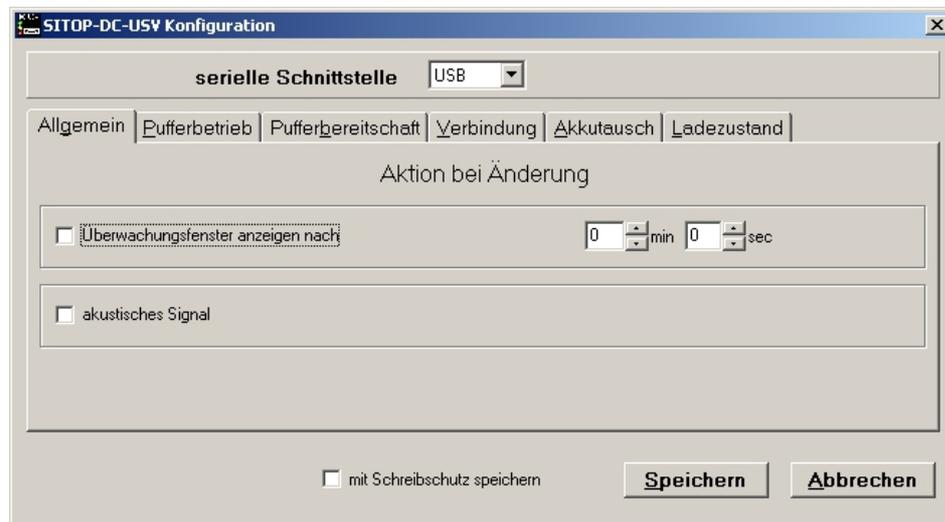
Fig 2-2: Configuration of the SITOP monitor: General settings

Parameterization of the SITOP monitor

Enter the path of the program that ensures that HMI Advanced and the PCU shut down properly in the event of a power failure into the parameter area of the buffer. E:\SITOP\Shutdown.bat
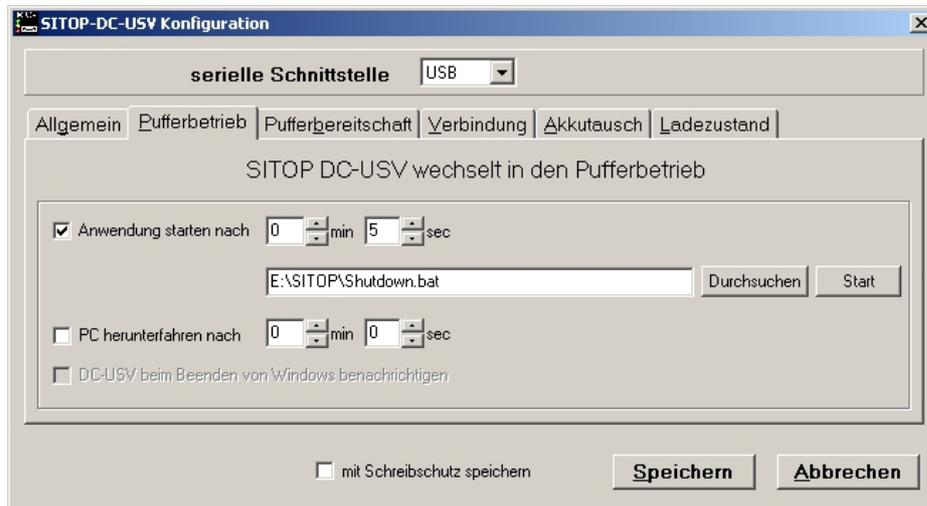
Fig 2-3:   Configuration of the SITOP monitor: Buffering settings

Alternative setting: E:\Windows\system32\hmiexit.exe

2.4.2 Configuration of the SITOP UPS module

Buffering parameterization

The UPS module can be used to select whether buffering should be completed after a predetermined period of time or not until the accumulator's exhaustive discharge threshold (= maximum buffer time) has been reached. Both buffering parameterizations result from this.

"Maximum buffer time" mode (as of PCU basic software XP 08.00.00)

This mode enables the system to be shut down in a time-optimized manner. The UPS module is synchronized with the shutdown of the operating system. Buffering is maintained until the operating system has been shut down. The operating system must shut down within a maximum of five minutes (including all applications). Otherwise, the UPS module buffers for the maximum buffer time (dependent on the accumulator state).

Required settings on the UPS module (USB interface)

On - Off

Setting	Description
+2 V	Cut-in threshold
+1 V	Cut-in threshold
+0.5 V	+22 V fixed
+1V	
+1V	
+0.5 V	End-of-charge voltage
+0.2 V	End-of-charge voltage
+0.2V	+26.3 V fixed
+0.1V	
0.35 A/0.7 A	Charging current
Set time/max. time	
+320 s	
+160 s	
+80 s	Buffer time
+40 s	
+20 s	
+10 s	+5 s fixed
Disconnection	
Accumulator operating state on/off	

○ Default setting, delivery condition

● Required setting for operation on the PCU 50

"Fixed buffer time" mode

In this mode, the UPS module always buffers for the preselected, fixed period of time. It is not possible to synchronize the UPS module with the operating system shutdown.

Required settings on the UPS module

On – Off

Setting	Description
+2 V	Cut-in threshold
+1 V	Cut-in threshold
+0.5 V	+22 V fixed
+1V	
+1V	
+0.5 V	End-of-charge voltage
+0.2 V	End-of-charge voltage
+0.2V	+26.3 V fixed
+0.1V	
0.35 A/0.7 A	Charging current
Set time/max. time	
+320 s	
+160 s	
+80 s	Buffer time
+40 s	
+20 s	
+10 s	+5 s fixed
Disconnection	
Accumulator operating state on/off	

○ Default setting, delivery condition

● Required setting for operation on the PCU 50

2.4.3 Configuration for exiting the HMI

HMI Monitoring

Exiting of the HMI applications is monitored by a separate application, hmiexit.exe. This application is started implicitly via the shutdown.bat batch file. In case of error, the application forces the operating system to shut down. An error occurs if the HMI cannot be exited within the configured delay.

Optionally, the parameters below can be set for hmiexit in file: E:\SITOP\hmiexit.ini.

[Actions]
#delay in seconds for exiting HMI Advanced applications
Wait = 120
#action after delay has expired
ForceShutdown = True

These default settings only need to be changed if it takes longer than 120 seconds to exit the HMI applications in an OEM installation. This configuration is not usually changed.

Configuring the EXIT button

During production, the option to shut down the HMI via the EXIT button in the operating area menu should be disabled, as this function cannot be synchronized with the UPS module. The EXIT button is disabled by entering ExitButton=False in the Regie.ini file.

Hibernate

The operating system's hibernate mode is suspended when operating the UPS, as the USB interface always has to be active for the UPS module.

For more notes, please see the product descriptions using the corresponding order numbers.

■

Notes

3

3 Installing Software and Updates

3.1 Installing SINUMERIK products

Overview

This chapter describes how to install additional software based on the preinstalled PCU basic software or how to carry out an update.

The description below is based on the delivery condition of the hardware and software components.

The SINUMERIK desktop serves as a platform for the network operation, e.g. for the tasks below:

- Installing HMI system software
- Setting the runtime environment of the HMI system software
- Checking the hard disk or version
- Authorization of SIMATIC STEP7

3.1.1 Installation via SINUMERIK desktop

Configuring network operation

The SINUMERIK desktop provides the option of installing system software or a software update. This mostly affects installation and update packages, which are to be installed via the Windows network.

Installation can be performed in two ways:

- The installation/update package is stored in directory D:\Install. The installation/update process is started automatically during booting when the PCU is next booted. Only when the installation or update process is completed does normal boot manager continue and, if necessary, HMI software started.

- The installation/update process can be started from the SINUMERIK desktop directly by executing the installation/update package.

Using installation directories

Several installation directories can be set to enable a operator setup to be executed automatically. Installation directories are the D:\Install subdirectory and those directories listed in the [SetupDirs] section of the E:\Windows\System32\HMIServe.ini parameters file.

The D:\Install installation directory is preset there.
The key names contained within a section of the
E:\Windows\System32\HMIServe.ini parameters file must be unique.

Note

Prior to automatic execution of setups from the installation directories (e.g.,
D:\Install), a checkback screen is always displayed and must be acknowledged
manually.

Remedy:
A value can be configured in the registry to set whether the checkback screen
should be displayed or not.
Path in the registry: 'HKLM\SOFTWARE\Siemens\SINUMERIK\Basic software\
<version>\HMI Manager\ShowInstallStartDialog'

ShowInstallStartDialog
      = 0: Screen is not displayed (default setting)
      = 1: Screen is displayed

The installation directories are evaluated in the sequence described in the
parameters file. If the parameters file is missing or if it does not contain a
[SetupDirs] section, the preset "D:\Install" installation directory is considered
instead. If the [SetupDirs] section does contain installation directories, but not
"D:\Install", the "D:\Install" directory is not considered within the context of the set
installation directories.

When executing a setup using OpFile, whether or not the setup requires a reboot
once it has been completed is taken into account and displayed via a
corresponding OpFile entry. If a corresponding entry exists, a reboot is triggered. If
there is a chain of setups to be executed one after the other, the reboot is
performed once the final setup is complete.

Installing with the HMI Explorer

The "HMI Explorer" program is available on the SINUMERIK desktop. When this program is called, detailed version information relating to the HMI system software applications installed and to Windows XP is displayed.

From within HMI Explorer, it is possible to start or uninstall individual applications.
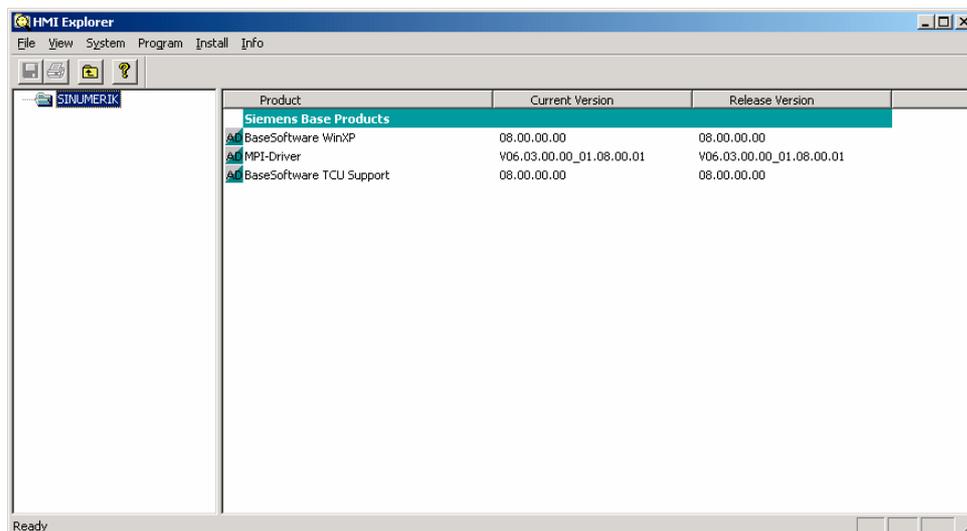
Fig. 3-1: HMI Explorer (example)

The properties dialog box provides detailed information on the software product installed:

- **Information on the SINUMERIK product:**

  The "Info" dialog box provides information on the selected SINUMERIK product:

Current version:	Indicates which SINUMERIK product version is currently installed. This version is output in long form below.
Internal Version:	Indicates the current, internal version number of this product.
Installation Date/Time:	Indicates the installation date and time of the current version.
Installation Path:	Shows the path for the main directory of the SINUMERIK product.
Application Start:	Provides information on the path to the *.exe file, which is used to start the SINUMERIK product.

- **Project language**

  The "Language" dialog box lists the installed languages for the respective SINUMERIK product and provides information on the name of the language installed. If this language is unknown, an abbreviation of the name is displayed. HMI Explorer knows these languages: German, English, Spanish, French, and Italian. In addition, the version of the language installed is displayed. Information on the installation time and date is also displayed.

- **Product history**

  The "History" dialog box provides information on the history of a
  SINUMERIK product. In this dialog box, information is displayed on the
  release version and possible service packs and hotfixes. The
  "Release" entry is always available.The "Service Pack" and "Hotfix" entries
  are displayed depending on whether or not these have been installed. For
  each entry in the list, the system displays the information "Version",
  "Internal Version" and "Installation Date/Time".

- **Component information**

  The "Components" dialog box displays information about the components
  included with a product:

Component:	Component name
Version:	Internal version of the component
Path:	Component path
File:	*.exe file
Enable :	Indicates whether or not the component is activated
Description:	Component description
Type:	Component type
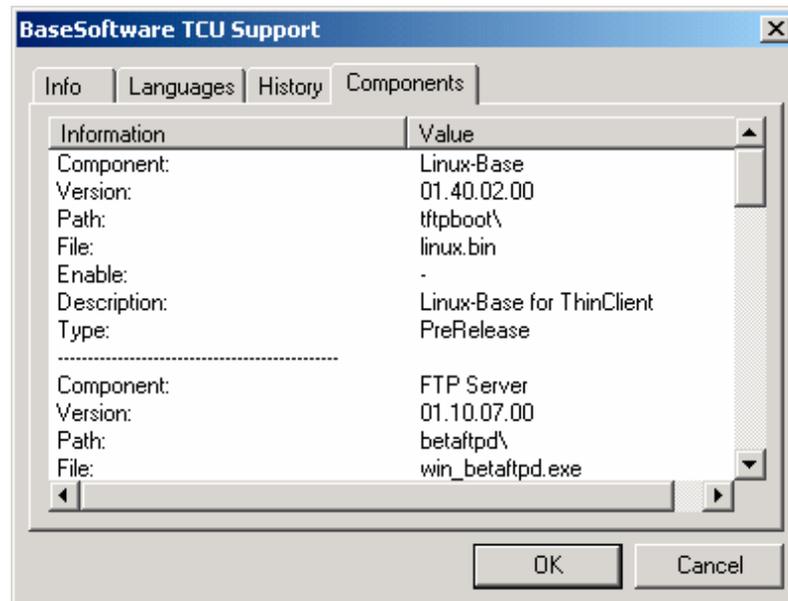
Fig. 3-3: "Components" dialog box (example)

3.1.2 SIMATIC STEP7 installation and authorization

SIMATIC STEP7 $\geq$ V**5.2** can be installed on the PCU as an AddOn.

Delivery item:	SIMATIC STEP7 V5.2 and V5.3
Components:	SIMATIC STEP 7 V5.2 and AddOn for SINUMERIK 810D/840D(i) Data volume: 480 MB approx.
Type of delivery:	The software comprises two installation packages, STEP7 V5.2 and an add-on for use with SINUMERIK 810D/840D(i). This add-on is entered in the system under the name "SINUMERIK 810D/840D V2.6".
System requirements: **Recommendation:**	PCU basic software 8.0 or higher A network interface or an external CD-ROM drive is required. Mouse port

! Attention

The "MPI driver" package available on the PCU is part of the HMI software and must not be uninstalled!

Operating in Windows XP

STEP7 should not be installed in the D: or E: partitions.
If, during the first boot after installing STEP7 in HMI Advanced, the system displays the message "WARNING: Application rngofrm didn´t post InitComplete," the PCU must be rebooted.
You must follow the installation sequence described here!

1. Boot the PCU 50 in Windows desktop.
2. Create access to the STEP7 CD (via a network or an external CD-ROM drive).

3. Switch to the STEP7_V5.1 directory on the CD and call SETUP.EXE.   The installation proceeds with operator prompting. You will be prompted to enter the ID number (see CD label). The installation directory on partition F: can be used.

   Press "Skip" to acknowledge the prompt for the license key disk.
   On completion of this setup, **you need not boot** the PCU.

4. Switch to the SINUMERIK_Add_on directory on the CD and call SETUP.EXE.
   The installation proceeds with operator prompting.
   On completion of this setup you must **boot** the PCU. Reboot in the Windows
   desktop.

5. Call the "STEP7 Authorizing" desktop icon.
   STEP7 is now authorized and can be started from the HMI Advanced software
   (second menu bar in the area menu, protected to protection level 3).

   The following entries are made automatically in **F:\Add_on\oemframe.ini**:
   [s7tgtopx]
   ; with HMI Advanced: eliminate minimize/maximize buttons
   ; of the STEP7 window
   WindowStyle_Off=196608
   ; with HMI Advanced: switch to previous task when STEP7 is terminated
   nSwitchToTaskAfterTermination= -2

6. These entries may also need to be modified in OEM configurations.

3.1.3 Reinstalling Windows components

The "SINUMERIK Service Pack Recovery Media WIN XP ProEmbSys" is available
for a PCU50.3 with Windows XP ProEmbSys for reinstalling Windows software
components and for restoring the original delivery status.

You can find more notes in Chapter 4 under "Restoring system data from original
CD".

                                                                                    ■

Notes

4

4 Backing Up and Restoring Data

4.1 Backing up and restoring data

Overview

The entire contents of hard disks can be saved as a disk image using the Symantec Ghost software. These disk images can be stored on various data carriers and the data restored to the hard disk at a later date.

PCU replacement hard disks and complete PCU hard disks are supplied by the plant with Symantec Ghost already installed. Symantec Ghost is used in the data backup and data restore procedures described in the following chapters.

More information is available on the Internet at http://www.ghost.com/
For the next steps, also refer to Chapter 1.1.1 "Partitioning the hard disk"

4.1.1 Starting the ServiceCenter

Starting the SINUMERIK desktop

To carry out service tasks, branch into the SINUMERIK desktop at the PCU 50.3 boot.

During the boot, there is a time interval where you must press the button <3> while the version information is displayed in the background on the lower right. At the login, enter the password "SUNRISE".

On the SINUMERIK desktop, you will find the link to the "ServiceCenter" program:

1.   After you double-click here, the system displays the following dialog box:
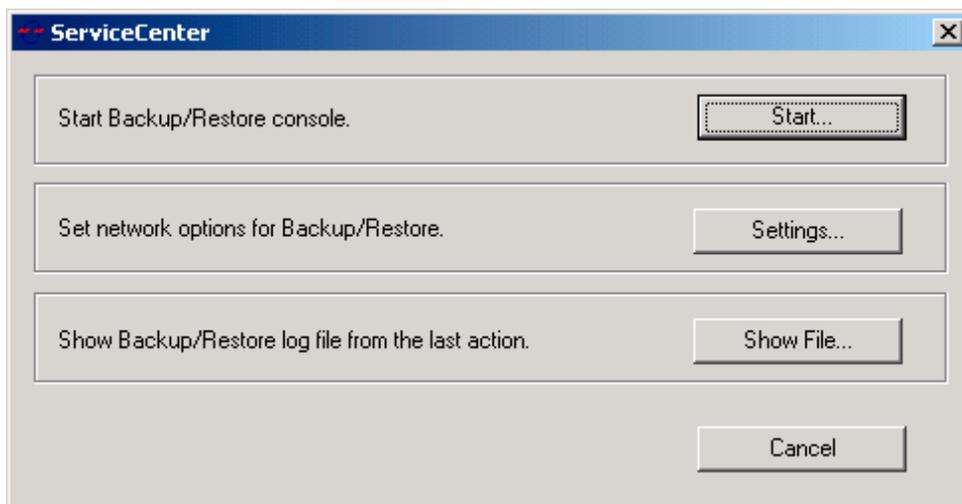
Fig. 4-1:   Starting the ServiceCenter

2.   Afterwards, select "Start" to trigger the system shut down and the service
      system start.

3.   For a direct connection to a programming device or PC to the system, you can
      check the IP addresses set in "Settings" and reset them if needed.

      Eth 1 is preset as the standard DHCP client for the connection to a company
      network. Eth 2 is preset as SINUMERIK DHCP server for the connection to a
      system network with the fixed IP address 192.168.214.241 and subnet mask
      255.255.255.0
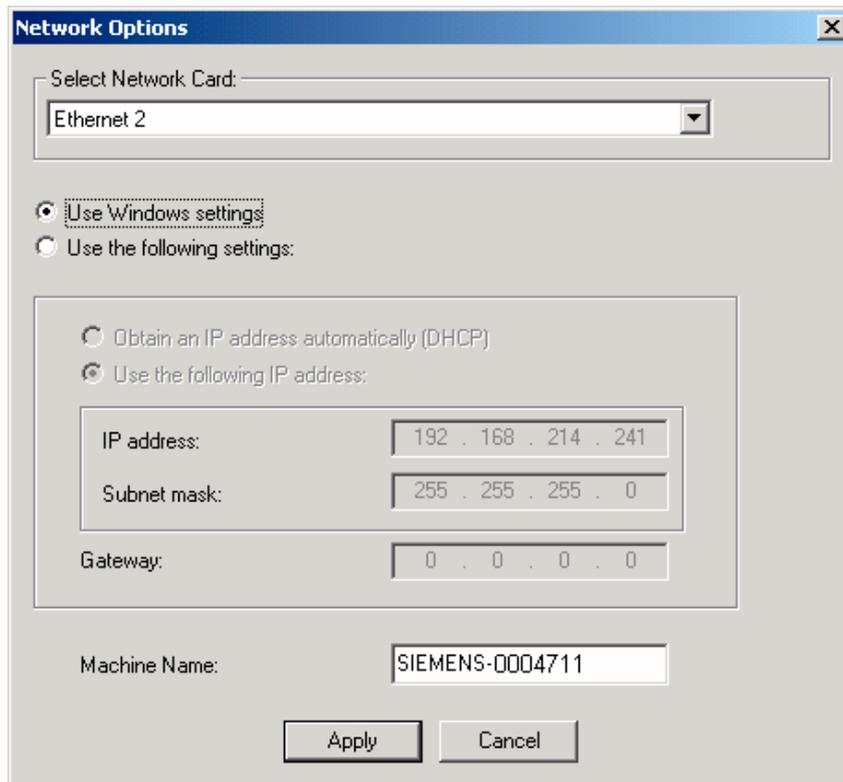
Fig. 4-2:   Network Settings

4.   Select "Use Windows settings" to keep the factory default settings. (This is the
      default setting here as well.)

5.   Select "Use the following settings" to set a new configuration:
      –   By using "Obtain an IP address automatically (DHCP)," you will receive an
          automatically assigned IP address from your DHCP server.
      –   If you select "Use the following IP address," enter an IP address in the
          range 192.168.214.250 – 254 with subnet mask 255.255.255.0

6.   In "Show Backup/Restore log file from the last action," you can view the log of
      the last data backup.

For details on setting the IP address:
→   see /IM5/ Commissioning TCU, chapter "Factory default settings"

Selecting a service task

After the service system has booted in WinPE 2005, the "ServiceCenter" dialog box opens:
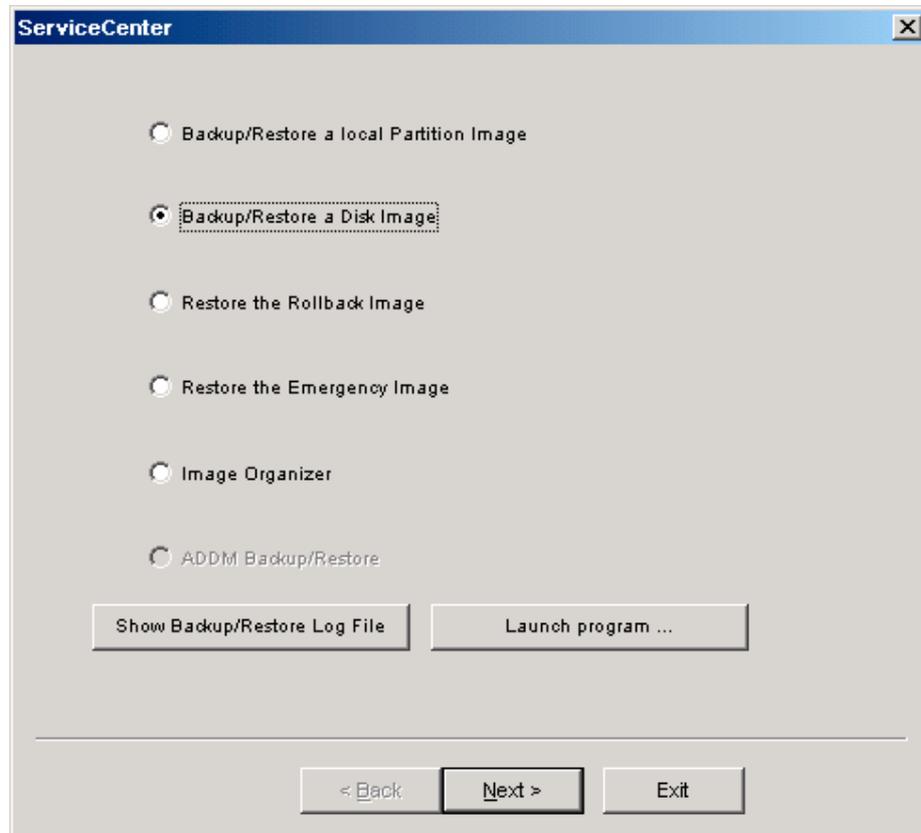
Fig. 4-3: ServiceCenter selection menu

Select from the following service tasks:

- Backup/Restore a local Partition Image
- Backup/Restore a Disc Image
- Restore the Rollback Image (most current image)
- Restore the Emergency Image (image of Windows system partition)
- Image Organizer

Show Backup/Restore log file

This option opens file bacres.txt, which contains a log of all backup records.

Launch Program

To launch a program in the service system, enter the program name here, for example "cmd" to launch a DOS shell.

4.1.2 Backup/restore partition locally

Backing up partitions (general procedure)

In "Backup/Restore a local Partition Image," select the "Backup" action to backup an image of one or more partitions C, E, and F locally on partition D:\Images of the hard disk:
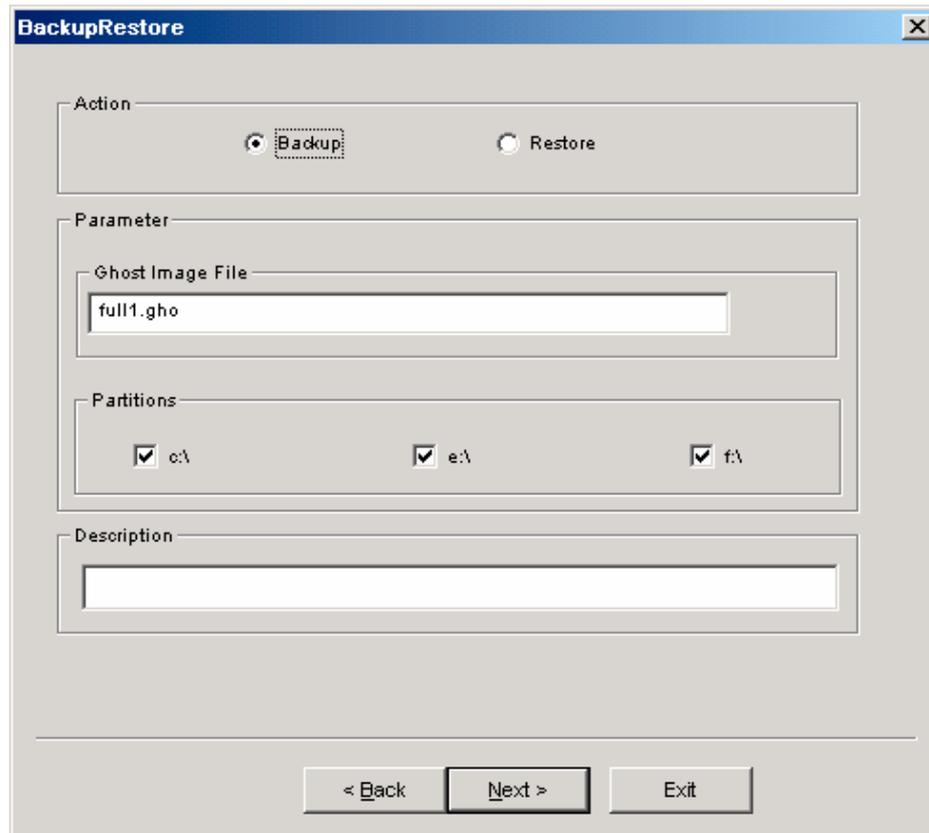
Fig. 4-4: Local data backup on partition D

Select "Next>" to have the system lead you step-by-step:

1. Select the partitions for which you want to create an image.

    If you wish to save the backup and restore it later, we recommend that you create a complete image (C, E, and F).

2. Before the backup process is started, the system displays the size of each partition in the next dialog box.

3. To obtain suitable images for archiving, specify the desired size of the data packets in "Options".

Restoring partitions

In "Backup/Restore a local Partition Image," select the "Restore" action to restore an image of one or more partitions C, E, and F locally from partition D:\Images:

Restore the Rollback Image (most current image)

To restore the last backup image i.e. the latest image (Rollback Image), select "Restore the Rollback Image".

The rollback image is the image of any combination of the hard disk partitions.

4.1.3 Hard disk backup/restore

Backing up the hard disk

Select "Backup/Restore a Disc Image" to backup an image of the hard disk via network connection:

Select "Next>" to have the system lead you step-by-step:

1. To create a network connection with access to a released drive, select "Net Share". In the "File" field, enter the name of the file; in the "Share" field, enter the complete path name of the drive to be connected.
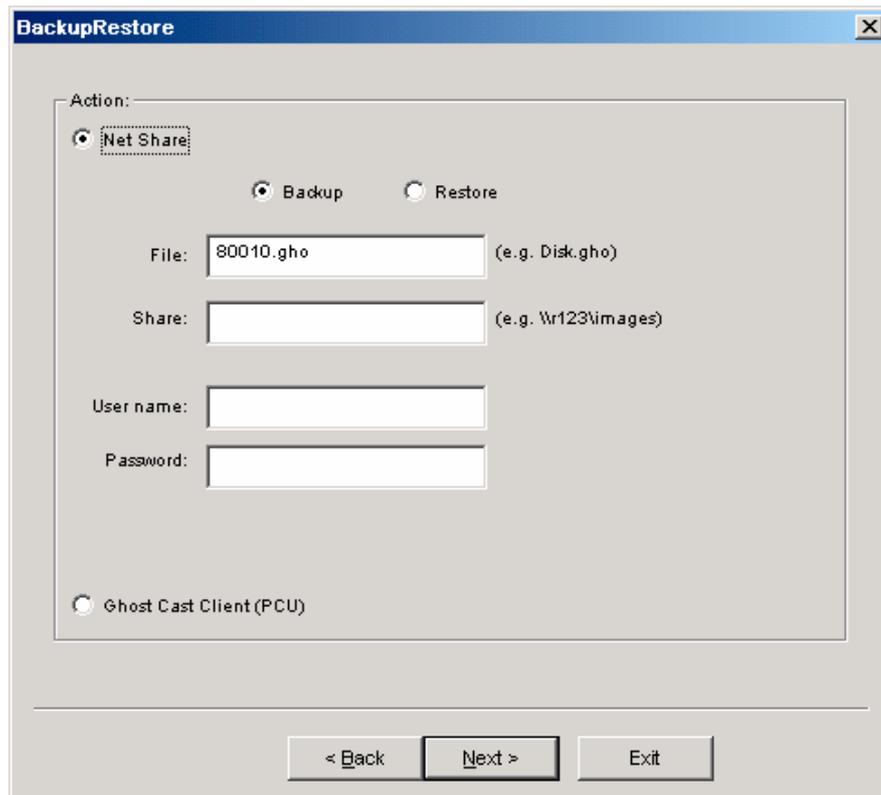
Fig. 4-5:   Backing up a hard disk via network drive

2. To obtain the access authorization, enter a user name and password.

3. Under "Options", select either one backup file or several data packets and define their sizes.

Alternatively, a 1:1 connection is created using the "Ghost Cast Client" software, for example. For this, the Ghost software must be installed with a license on the target drive.

Restoring the hard disk

In "Backup/Restore Disc Image," select the action "Restore" to restore an image. Select "Next>" to have the system lead you step-by-step.

4.1.4 Restoring system data ("Emergency Image")

Restoring system data

To restore the emergency image, select "Restore the Emergency Image". This image <u>must</u> contain the backup of the partition E and <u>may</u> also contain a backup of the partitions C, D or F. It is intended to be used in the event that the system crashes or the system does not boot after an uncontrolled shutdown.

This image must not impair the execution of installed applications, i.e., the registry entries for all applications installed on F: must be included in the image. Use the "Image Organizer" function to designate an image that meets these conditions as the emergency image.

Organizing images

Select the "Image Organizer" option to designate an image contained in the displayed list as the emergency image or to delete an existing image.

4.1.5 Restoring system data from the original CD

Use

In case of software errors, you can reinstall your software by means of the Recovery CD, the Documentation and Drivers CD and the Restore CD/DVD.

Restoring the delivery condition

The "SINUMERIK Service Pack Recovery Media WIN XP ProEmbSys" is available for a PCU50.3 with Windows XP ProEmbSys for reinstalling Windows software components and for restoring the original delivery status.

You can restore the entire hard disk with partition D: (system) and partition F: (user) or only restore partition D:. As a result, user data may be obtained on partition F:

Saving SIMATIC software authorization

> If you have installed SIMATIC software with a license key or authorization on the PC, check if you can save the license key or authorization on the hard disk. The transfer of license keys or authorizations is described in the Help for the Automation License Manager (ALM) program.

> If it is not possible to backup your authorization, please contact Customer Support (address in the preface). There you can obtain information necessary for your software authorization.

4.2 Backing up HMI Advanced environments

Setting the original SINUMERIK HMI environment

> The "Original SINUMERIK HMI Environ" function is available as a script file on the SINUMERIK desktop. The original delivery condition is set up, i.e., the contents of the directories below are saved, when this function is executed:

> – C:\RUNOEM
> – F:\ADD_ON
> – F:\OEM
> – F:\USER

> The directories are then cleared.

Setting the current SINUMERIK HMI environment

> The "Current SINUMERIK HMI Environ" function is available as a script file on the SINUMERIK desktop. When this function is executed, restoration of the original settings is canceled, i.e., the saved directory contents are copied back.

4.3 Commissioning the replacement hard disk

Overview

The mechanical and electrical steps involved in replacing a PCU 50.3 hard disk are described in:
References: /BHsl/   Operator components equipment manual

Note

The replacement hard disk is delivered without the Windows operating system and without HMI system software.

PCUs and replacement hard disks are supplied by the plant with Symantec Ghost already installed.

Hard disk backup using Symantec Ghost

The entire contents of hard disks can be saved as a disk image file using the Symantec Ghost software . This disk image file can be stored on various data carriers and the data restored to the hard disk at a later date.

Recommendation:
Archive the hard disk backup together with the Symantec Ghost program on CD.

Commissioning the replacement hard disk

Currently, there are no replacement hard disks available and for this reason no procedure is defined.

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Notes

5

5 Maintaining the System

5.1 PCU hardware diagnosis

Purpose

The PCU hardware supports the diagnosis of important system components via an integrated "Safecard," which is called the Safecard on Motherboard (SOM). These diagnosis functions are evaluated in the Windows-based HMI systems. The hardware error conditions are reported via the HMI user interface as alarms.

Monitored parameters

The following physical parameters of the PCU 50.3 hardware are monitored:
- CPU temperature
- Housing temperature
- I/O chip temperature
- Speed of rotation of both housing fans
- Status of the S.M.A.R.T system hard disk drive

Recording an error log

The PCU hardware monitor logs all hardware errors in the Windows event log so that an error output can still be carried out even for a PCU without HMI basic installation.

PCU status indicator

The display module for the PCU 50.3 is a seven-segment display. The hardware errors are output on this display system in coded form by the PCU hardware monitor.

Alarms output via HMI

The PCU hardware monitor generates the alarms specified below.

> **Note**
>
> The PLC interface of the HMI is located in DB 10 of the PLC program and is supplied by the PCU hardware monitor in the event of an error.

PCU temperature monitoring

The alarm must be acknowledged by the user. The alarm has no effect on the processing of a part program in the NCK.

Alarm number:	120010
Alarm text:	**PCU temperature monitoring**
Cause:	The temperature sensor on the PCU module has reached the response threshold: The temperature is high for the CPU, housing or chip set.
System reactions:	Alarm display PLC interface signal DB10.Byte103.Bit6 is set
Remedy:	• Switch off PCU; let it cool down. • Improve the ventilation for the PCU module.

	• Ensure the PCU module fan is working.
	If error occurs again, notify qualified service personnel.

PCU fan monitor - housing fan 1

The alarm must be acknowledged by the user. The alarm has no effect on the processing of a part program in the NCK.

Alarm number:	120021
Alarm text:	**PCU fan monitor - housing fan 1**
Cause:	Fan rpm of PCU module is outside the limit. Low fan rpm for CPU fan
System reactions:	Alarm display PLC interface signal DB10.Byte103.Bit4 is set
Remedy:	Switch off PCU; let it cool down. Qualified service personnel should check to see how well the PCU module housing fan 1 is working (fan problem).

PCU fan monitor - housing fan 2

The alarm must be acknowledged by the user. The alarm has no effect on the processing of a part program in the NCK.

Alarm number:	120022
Alarm text:	**PCU fan monitor - housing fan 2**
Cause:	
System reactions:	Alarm display PLC interface signal DB10.Byte103.Bit4 is set
Remedy:	Switch off CU; let it cool down. Qualified service personnel should check to see how well the PCU module housing fan 2 is working (fan problem).

PCU : Fatal hard disk error

The alarm cannot be deleted by an operation (category POWER ON). The alarm has no effect on the processing of a part program in the NCK.

Alarm number:	120029
Alarm text:	**Fatal hard disk error**
Cause:	A large number of writing/reading errors were identified on the hard disk. This suggests hardware failure is imminent (S.M.A.R.T error).
System reactions:	Alarm display PLC interface signal DB10.Byte103.Bit3 is set
Remedy:	Backup PCU data. Have hard disk replaced by qualified service personnel.

Further information:

- Replacement part description:
  Operator components manual, chapter PCU 50.3 replacement parts
- Commissioning after hard disk exchange:
  see Chapter "Backing up and restoring data"

5.2 Activate/deactivate error log at boot

Application

Every time the system is booted, information is written to a block in the file D:\\$$Base.log, which contains the date, time and actions of administrative interventions.

Information about the booting controlled by the HMI Manager can be displayed on the screen and written to log file D:\\$$Base.log.

Output in the log file

The output is controlled via registry values:

- Via the registry value

  "HKLM\SOFTWARE\Siemens\SINUMERIK\Basic software\<version>\HMI Manager\InfoLevel" the **type of information** to be output is set:
  InfoLevel (DWORD)

= 1:	Mandatory information is output (default setting)
= 2:	Mandatory and supplementary information is output
= 3:	Mandatory, supplementary and trace information is output
	(*InfoLevel <= 0* is handled like *InfoLevel == 1*;
	InfoLevel > 3 is handled like *InfoLevel == 3*)

- Via the registry value

  "HKLM\SOFTWARE\Siemens\SINUMERIK\Basic software\<version>\HMI Manager\ShowInfo" the following is set: whether **the information** is also to be **displayed on the screen** (as well as being output to the log file):

  ShowInfo (DWORD)

= 0:	Displays the mandatory information, No display of supplementary and trace information.
= 1:	Mandatory, supplementary and trace information is displayed (default setting)

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