Industrial
Hydraulics

**Electric Drives
and Controls**

Linear Motion
Assembly Technologies

Pneumatics

Service
Automation

Mobile
Hydraulics

Rexroth
Bosch Group

Rexroth PNC-P
Software Installation

1070 073 883
Edition 02

Operating Guidelines V7.3

Title	Rexroth PNC-P Software Installation
Type of Documentation	Operating Guidelines
Document Typecode	DOK-PNC***-SOFTINST***-IB02-EN-P
Purpose of Documentation	The present manual contains information concerning the installation of the PNC-P firmware in connection with the PC control panel, IPC300 or BT155/BT205.

Record of Revisions

Description	Release Date	Notes
DOK-PNC***-SOFTINST***-IB02-EN-P	06.2003	Gültig ab V7.3

Validity   The specified data is for product description purposes only and may not be deemed to be guaranteed unless expressly confirmed in the contract. All rights are reserved with respect to the content of this documentation and the availability of the product.

Contents

Contents

Safety Instructions

1   Safety Instructions

Before you start with the PNC-P software installation, we recommend that you thoroughly familiarize yourself with the contents of this manual. Keep this manual in a place where it is always accessible to all users.

1.1   Intended use

Concerning the proper use, refer to the additional documentation listed in section 1.6.

The PNC-P control is used to

- activate feed drives, spindles and auxiliary axes of a machine tool via SERCOS interface for the purpose of guiding a processing tool along a programmed path to process a workpiece (CNC). Furthermore, I/O components are required for the integrated PLC which – in communication with the actual CNC – controls the machine processing cycles holistically and acts as a technical safety monitor.
- program contours and the processing technology (path feedrate, spindle speed, tool change) of a workpiece.

The products described

- have been developed, manufactured, tested and documented in compliance with the safety standards. These products pose no danger to persons or property if they are used in accordance with the handling stipulations and safety notes prescribed for their configuration, mounting, and proper operation.
- comply with the requirements of
  - the EMC Directives (89/336/EEC, 93/68/EEC and 93/44/EEC)
  - the Low-Voltage Directive (73/23/EEC)
  - the harmonized standards EN 50081-2 and EN 50082-2
- are designed for operation in industrial environments, i.e.
  - no direct connection to public low-voltage power supply,
  - connection to the medium- or high-voltage system via a transformer.

In residential environments, in trade and commerce as well as small enterprises class A equipment may only be used if the following warning is attached:

☞ **This is a Class A device. In a residential area, this device may cause radio interference. In such case, the user may be required to introduce suitable countermeasures, and to bear the cost of the same.**

The faultless, safe functioning of the product requires proper transport, storage, erection and installation as well as careful operation.

Safety Instructions

1.2 Qualified personnel

The requirements as to qualified personnel depend on the qualification profiles described by ZVEI (central association of the electrical industry) and VDMA (association of German machine and plant builders) in:
Weiterbildung in der Automatisierungstechnik
edited by: ZVEI and VDMA
MaschinenbauVerlag
Postfach 71 08 64
D-60498 Frankfurt.

The present manual is designed for **project engineers and PC specialists**. They require special knowledge of the Windows™ operating systems and network configurations.

Programming, start and operation as well as the modification of programs or program parameters may only be performed by properly trained personnel! This personnel must be able to judge potential hazards arising from programming, program changes and in general from the mechanical, electrical, or electronic equipment.

Interventions in the hardware and software of our products, unless described otherwise in this manual, are reserved to our specialized personnel.

Tampering with the hardware or software, ignoring warning signs attached to the components, or non-compliance with the warning notes given in this manual may result in serious bodily injury or material damage.

Only electrotechnicians as recognized under IEV 826-09-01 (modified) who are familiar with the contents of this manual may install and service the products described.

Such personnel are
● those who, being well trained and experienced in their field and familiar with the relevant norms, are able to analyze the jobs being carried out and recognize any hazards which may have arisen.
● those who have acquired the same amount of expert knowledge through years of experience that would normally be acquired through formal technical training.

With regard to the foregoing, please note our comprehensive range of training courses. Please visit our website at
http://www.boschrexroth.com
for the latest information concerning training courses, teachware and training systems. Personal information is available from our Didactic Center Erbach,
Telephone: (+49) (0) 60 62 78-600.

Safety Instructions

1.3　Safety markings on products

Warning of dangerous electrical voltage!

Warning of danger caused by batteries!

Components sensitive to electrostatic discharge!

Warning of hazardous light emissions (optical fiber cable emissions)

Disconnect mains power before opening!

Lug for connecting PE conductor only!

Connection of shield conductor only

Safety Instructions

1.4   Safety instructions in this manual

DANGEROUS ELECTRICAL VOLTAGE
This symbol is used to warn of a **dangerous electrical voltage.** The failure to observe the instructions in this manual in whole or in part may result in **personal injury**.

DANGER
This symbol is used wherever insufficient or lacking compliance with instructions may result in **personal injury**.

CAUTION
This symbol is used wherever insufficient or lacking compliance with instructions may result in **damage to equipment or data files**.

☞ This symbol is used to draw the user's attention to special circumstances.

★ This symbol is used if user activities are required.

Safety Instructions

1.5   Safety instructions for the described product

	DANGER **Danger of life through inadequate EMERGENCY-STOP devices!** **EMERGENCY-STOP devices must be active and within reach in all system modes. Releasing an EMERGENCY-STOP device must not result in an uncontrolled restart of the system!** **First check the EMERGENCY-STOP circuit, then switch the system on!**
	DANGER **Incorrect or undesired axis movement!** **First, new programs should be tested carefully without axis movement! For this purpose, the control offers the possibility of inhibiting axis movements and/or auxiliary function outputs by appropriate softkeys in the 'Automatic' mode.**
	DANGER **Incorrect or undesired control unit response!** **Rexroth accepts no liability for damage resulting from the execution of an NC program, an individual NC block or the manual movement of axes!** **Furthermore, Rexroth accepts no liability for consequential damage which could have been avoided by programming the PLC appropriately!**
	DANGER **Retrofits or modifications may adversely affect the safety of the products described!** **The consequences may include severe injury, damage to equipment, or environmental hazards. Possible retrofits or modifications to the system using third-party equipment therefore have to be approved by Rexroth.**
	DANGEROUS ELECTRICAL VOLTAGE **Unless described otherwise, maintenance works must be performed on inactive systems! The system must be protected against unauthorized or accidental reclosing.** **Measuring or test activities on the live system are reserved to qualified electrical personnel!**

Safety Instructions

DANGER
Tool or axis movements!
Feed and spindle motors generate very powerful mechanical forces and can accelerate very quickly due to their high dynamics.

- **Always stay outside the danger area of an active machine tool!**
- **Never deactivate safety-relevant functions!**
- **Report any malfunction of the unit to your servicing and repairs department immediately!**

CAUTION
Only spare parts approved by Rexroth may be used!

CAUTION
Danger to the module!
All ESD protection measures must be observed when using the module! Prevent electrostatic discharges!

The following protective measures must be observed for modules and components sensitive to electrostatic discharge (ESD)!

- Personnel responsible for storage, transport, and handling must have training in ESD protection.
- ESD-sensitive components must be stored and transported in the prescribed protective packaging.
- ESD-sensitive components may only be handled at special ESD-workplaces.
- Personnel, working surfaces, as well as all equipment and tools which may come into contact with ESD-sensitive components must have the same potential (e.g. by grounding).
- Wear an approved grounding bracelet. The grounding bracelet must be connected with the working surface through a cable with an integrated 1 MΩ resistor.
- ESD-sensitive components may by no means come into contact with chargeable objects, including most plastic materials.
- When ESD-sensitive components are installed in or removed from equipment, the equipment must be de-energized.

Safety Instructions

1.6   Documentation, software release and trademarks

Documentation

The present manual contains information concerning the installation of the PNC-P firmware in connection with the PC control panel, IPC300 or BT155/BT205.

Overview of available documentation	Part no.		
	German	**English**	**French**
PNC-P − Connectivity Manual	1070 073 880	1070 073 881	−
PNC-P − BF2xxT/BF3xxT Control Panel Connectivity Manual	1070 073 814	1070 073 824	−
PNC-P − Software installation	1070 073 882	1070 073 883	−
Description of functions	1070 073 870	1070 073 871	−
MACODA Operation and configuration of the machine parameters	1070 073 705	1070 073 742	−
Operating instructions − Standard operator interface	1070 073 726	1070 073 739	1070 073 876
Operating instructions − Diagnostics Tools	1070 073 779	1070 073 780	−
Error Messages	1070 073 798	1070 073 799	−
PLC project planning manual, Software interfaces of the integrated PLC	1070 073 728	1070 073 741	−
iPCL system description and programming manual	1070 073 874	1070 073 875	−
ICL700 system description (PNC-R only), Program structure of the integrated PLC ICL700	1070 073 706	1070 073 737	−
DIN programming manual for programming to DIN 66025	1070 073 725	1070 073 738	−
CPL programming manual	1070 073 727	1070 073 740	1070 073 877
CPL Debugger Operating Instructions	1070 073 872	−	−
Tool Management − Parameterization	1070 073 782	1070 073 793	−
Software PLC Development environment for Windows NT	1070 073 783	1070 073 792	−
Measuring cycles for touch-trigger switching probes	1070 073 788	1070 073 789	−
Universal Milling Cycles	−	1070 073 795	−

☞ **In this manual the floppy disk drive always uses drive letter A:, and the hard disk drive always uses drive letter C:.**

Safety Instructions

Special keys or key combinations are shown enclosed in pointed brackets:

● Named keys: e.g., <Enter>, <PgUp>, <Del>
● Key combinations (pressed simultaneously): e.g., <Ctrl> + <PgUp>

Release

☞ **This manual refers to the following version:**
Software release: V7.3

The current release number of the individual software modules can be viewed by selecting the 'Control-Diagnostics' softkey in the 'Diagnostics' operating mode.

The software version of Windows may be displayed as follows:

1. Click the right mouse button on the **My Computer** icon on your desktop.
2. Select **Properties**.

Trademarks

All trademarks of software installed on Rexroth products upon delivery are the property of the respective manufacturer.

Upon delivery, all installed software is copyright-protected. The software may only be reproduced with the approval of Rexroth or in accordance with the license agreement of the respective manufacturer.

MS-DOS® and Windows™ are registered trademarks of Microsoft Corporation.

PROFIBUS® is a registered trademark of the PROFIBUS Nutzerorganisation e.V. (user organization).

SERCOS interface™ is a registered trademark of Interessengemeinschaft SERCOS interface e.V.

Hardware components

2   Hardware components

☞ **For a detailed description of the hardware, please refer to the "PNC-P Connectivity" manual.**

2.1   PC basic units

The PNC-P plug-in adapter is available with the following PC basic units:

- PC control panel (osa display pc with osa keyboard)
- BT155 and BT205 control terminals
- IPC 300 with separate BF3xx control panel
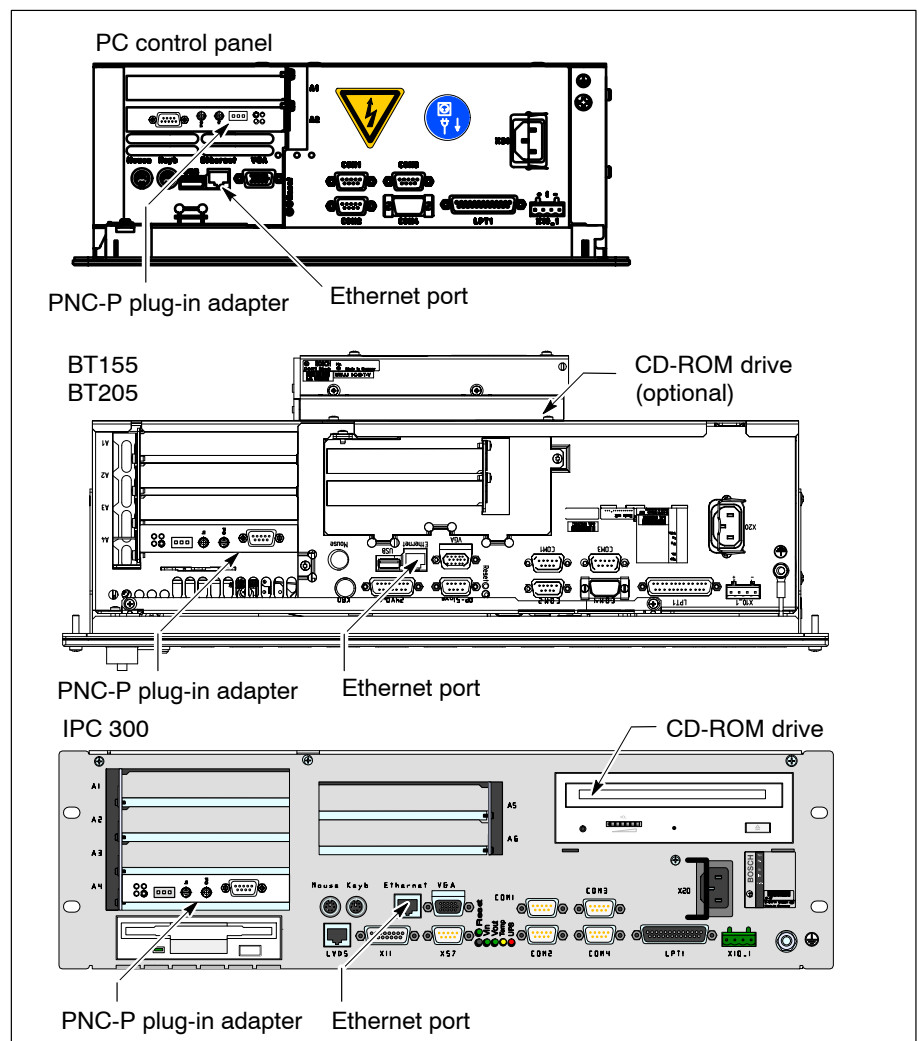
Hardware equipment

All the systems listed above comprise the following items:

- an industrial PC including hard disk drive
- one PNC-P adapter with integrated PLC
- one Ethernet network adapter

Hardware components

2.2   PNC-P plug-in adapter

Technical equipment

The PNC-P plug-in adapter occupies one PCI slot on the PC motherboard and comprises the following items:

- Fibre optics connector for SERCOS interface
- PROFIBUS-DP master
- Ready contact
- 3 LEDs for status displays
- 1 Watchdog reset button (for internal use only)
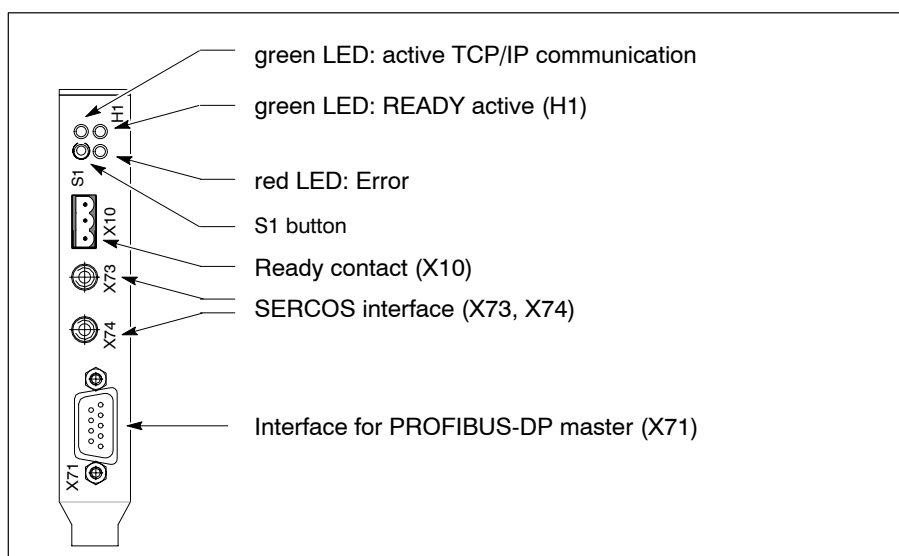
For a detailed description of the interfaces, please refer to the "PNC-P Connectivity" manual.

Hardware components

2.3   CD-ROM drive on the network

The software can be installed via an Ethernet network. The necessary CD-ROM drive is located on a network server (for details, refer to section 7).
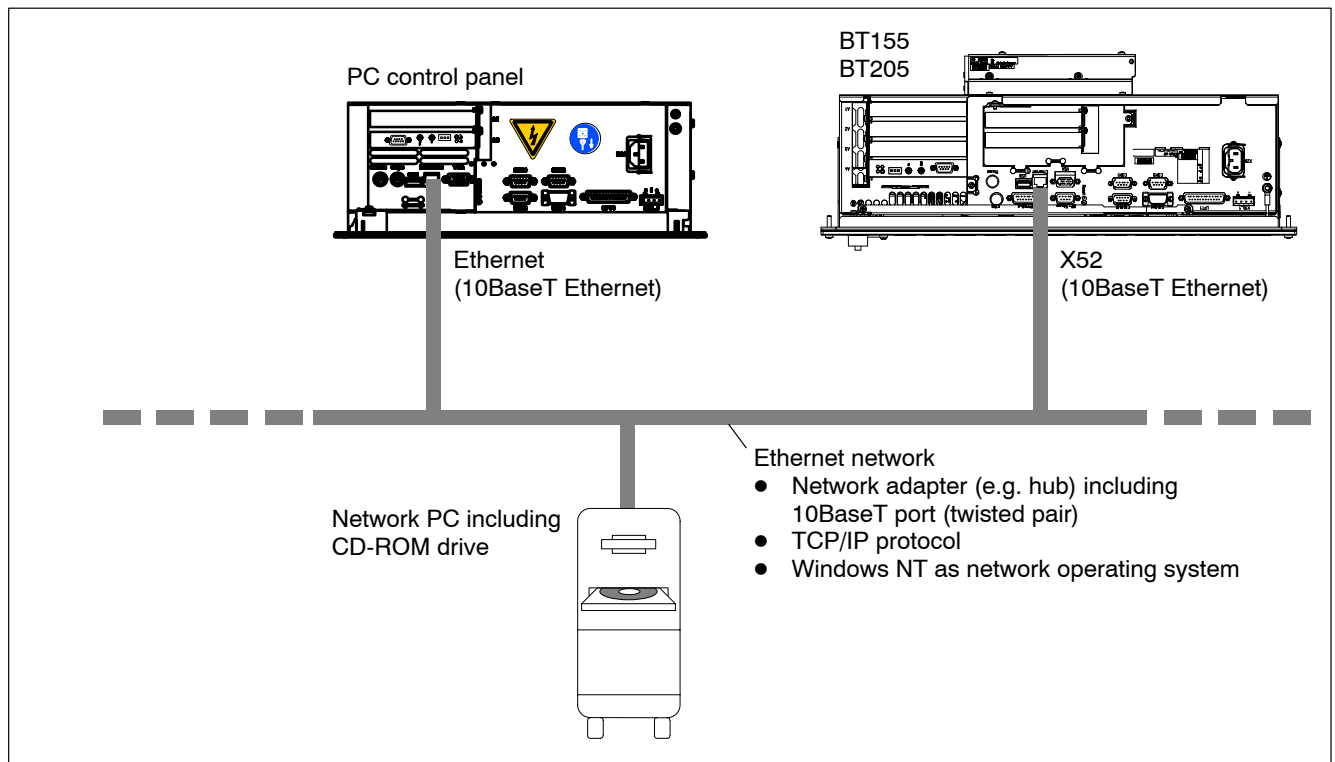
Conditions:
- Ethernet link available
- TCP/IP protocol for data transmission through the network
- shared CD-ROM network drive on network server.

The installation of the PNC-P software under Windows NT 4.0 or Windows 2000 must be carried out with "administrator privileges"!

☞ **The network settings will be made by the network administrator, for more details refer to your individual Windows manual.**

The following information and settings must be provided for the network:
- Adjustment of IP addresses of the network adapter of the osa display pc or BT155, BT205 or IPC300 to the existing network.
- granting access privileges (directory sharing) for the nodes involved (refer to section 7.1)
- connecting CD-ROM network drive (refer to section 7.2).

Hardware components

2.4   Integrated CD-ROM drive (BT155, BT205 or IPC300)

Alternatively, the software installation may also be performed from a local CD-ROM drive.

- always available in IPC300
- optionally in BT155, BT205, IPC300
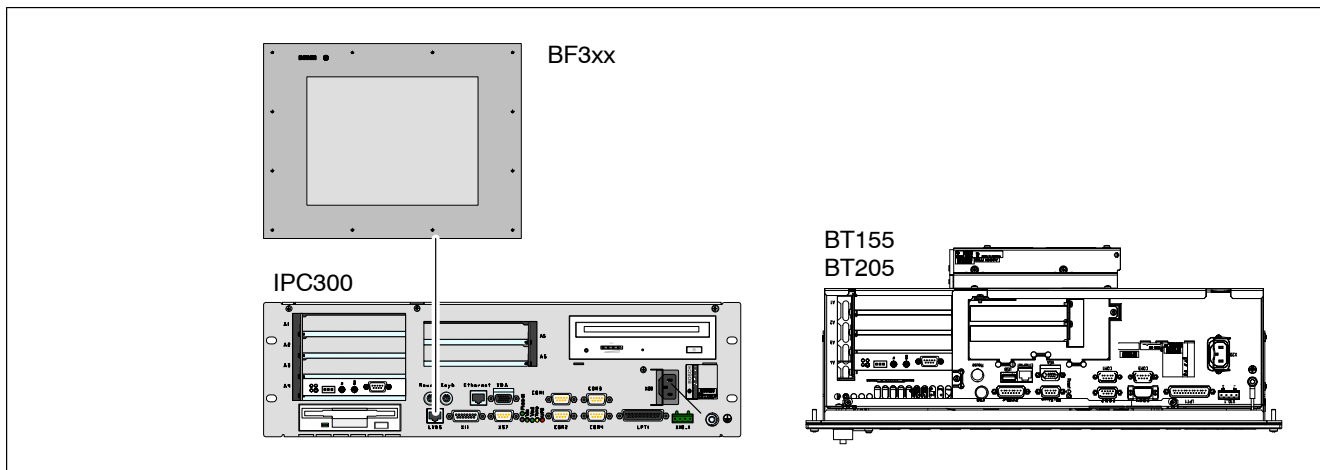
Software installation

3   Software installation

3.1   Software package

The software required for operating the PNC-P has been completely
pre-installed in the factory. For updates, the PNC-P software package is
available on CD-ROM.

Setup folder of the
PNC software CD, Version 7.3.5
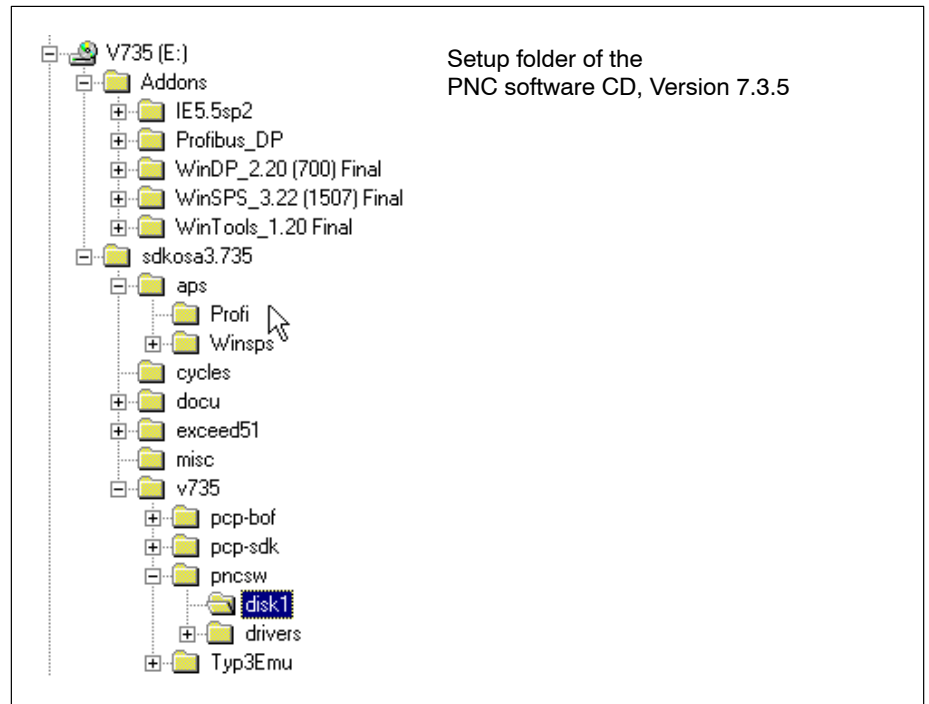
It contains the following:
- Operating system software of the PNC-P
- PNC Control, control software of the PNC-P
- Standard BOF software
  (Standard operator interface for PNC controls)
- Exceed 5.1 for X-Window integration
- Updates for Rexroth application software (logbook, CPL debugger,
  axis oscilloscope, ...)
- Documentation
- Release Notes for Rexroth applications.
- MS Internet Explorer, Adobe Acrobat Reader for Rexroth user manu-
  als
- other programs: WinSPS and WinDP for programming the PLC

Software installation

3.2   Procedure for software installation
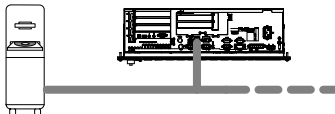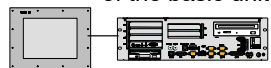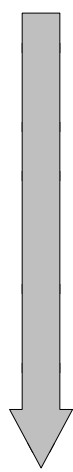
Normally, the software installation is an **update** of the pre-installed software package, whereas initial installation may be required after replacement of components only.

The installation is:

- **User-friendly:** operator-guided installation, programs for configuration and data protection
- **with network support:** integrated network access via Ethernet with TCP/IP protocol

The necessary installation steps have been described for an installation via the network. It is also possible to use the local CD-ROM drive in the IPC300 basic unit, whereas a local CD-ROM drive is optionally available for BT155, BT205.

Overview

Installation via network or via local CD-ROM drive		Section
Software update	Initial installation	
Installation via network Installation via local CD-ROM drive of the basic unit		
Installing the software		
Prepare shared CD-ROM drive in the network (or local CD-ROM drive, if available)		2.3
Store PNC data in the archive	–	3.4
Initiate a PNC RESET	–	
Finish all current applications and services (PNC Control, BOF etc.)	–	
–	install Exceed, if necessary	3.8
Perform "Setup" of the PNC installation program on the installation CD-ROM		3.5
Restore PNC data	–	3.6.1
Network settings (if necessary)		
–	Configure PNC-P adapter	3.7

Software installation

3.3　　Program overview

The following table contains a **program overview** of the software that can be installed from the CD and the access path of the start program on the CD.

☞　**The CD-ROM drive is always drive D:.**

Type	Software name	Used for	Installation on	Installation with program name (on CD)
X-Window Server	Exceed	X server for PNC application (BOF)	Basic unit	**Setup.exe** in folder D:\exceed51\Winnt
PNC-P soft-ware & tools	PNC Control	Control program for the PNC	Basic unit	**Setup.exe** in folder D:\V7xxx\pncsw\disk1
	CPL cycles, other cycles	Cycles for user programs	PNC Mount directory	automatically with setup type "Typical"
	CPL debugger	Debugging of CPL programs	Basic unit	activate the *Tools ▶ CPL-Debugger* option with setup type "Custom"
	Logic Analyzer	Logic analyzer	Basic unit	activate the *Tools ▶ Logic Analyzer* option with setup type "Custom"
	Oscilloscope	Axis oscilloscope	Basic unit	activate the *Tools ▶ Oscilloscope* option with setup type "Custom"
	PNC operating system	Control unit software	Basic unit	automatically, or manually with PNC-Control
	Documentation	All manuals for the control unit in PDF format	Basic unit	automatically with setup type "Typical"
	Logbook	Logging of system events	Basic unit	automatically with setup type "Typical"
Cycles Update	e.g. drilling	Update of Drilling CPL cycle in PNC	Basic unit	e.g. **Bohren.exe** in directory D:\cycles
Application software	Miscellaneous	• BOF (NC user interface)	• Basic unit	• automatically with setup type "Typical"
		• User-specific programs (APS modules, ..)	• Basic unit or external PC	• APS files in directory D:\aps\Winsps\iPCL
		• WinDP (programming software for PROFIBUS-DP)	• Basic unit or external PC	• **WinDP_220_final_700_set-up_D.exe** in directory D:\WinDP_2.20 (700) Final\WinZIP_setup
		• WinSPS (programming software for iPCL, separate license required)	• Basic unit or external PC	• **WinSPS_322_fi-nal_1507_setup_D.exe** in directory D:\WinSPS_3.22 (1507) Final\WinZIP_setup

Software installation

3.4   Data protection prior to update


☞

CAUTION
Loss of data.
Backup your data before the software update or before replacing the PNC-P adapter in an archive.

All programs installed, user functions and settings of the entire system should be backed up **before the update** in order to ensure that all original system functions can be restored afterwards.
The PNC Control function generates a joint archive file with the ".tar" filename extension for this purpose. This file contains all relevant data, it is saved in a mount directory.

☞ **The archives generated by the PNC-P on the hard disk drive should additionally be copied to external media (floppy disk, CD-ROM) or on a network drive.**

The following files may be optionally **backed up in the archive:**
- RAM file system of the PNC-P
  (files and directories in the RAM memory including active PLC program)
- User FEPROM of the PNC-P
  (directory "C:\pnc\<PNC name>\usrfep" on the hard disk drive of the basic unit containing, e.g., the backed-up PLC program, user data, etc.)
- Values of permanent CPL variables
- Tool tables (from database)
- MACODA parameters (from database)
- Data modules

The following will **not** be included in the backup:
- all files on mounted NFS file systems (except usrfep directory)
- all files in the FEPROM file system (pncfep.pxf)

Software installation

★   Select the menu sequence: *Commands* ▶ *Archive create* or

click on ![save icon]

![PNC Control window screenshot: ARCHIVE PAGE CREATE dialog with checkboxes — User - FEPROM, RAM - Filesystem, MACODA, Tool Tables, Permanent CPL-Variables, Rem. Data Modules and Markers; Create and Exit buttons]
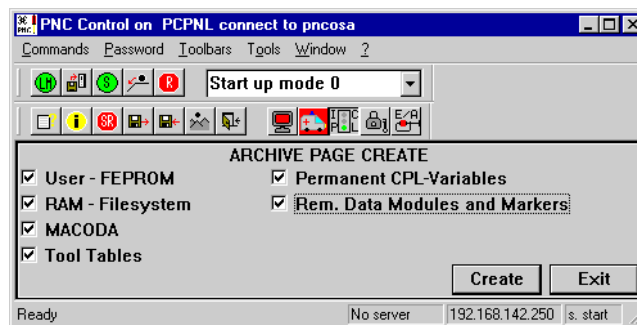
For details, refer to section 4.4.7.

☞   **The archive function can also be invoked using the NC user inter-face (BOF).**

After a software update or hardware replacement, you may restore se-lective data from the archive (refer to section 4.4.7).

Please not the following for the **PLC program** after having restored pre-viously backed-up data:
● Boot the controller with the last active PLC program from the RAM file system with startup mode = 0 (default setting)
● Boot the controller with the PLC program stored in the user FEPROM with startup mode = 2 or 6
● The PLC program must be executable, however, it may be necessary to modify the program after a software update. For more information, refer to, e.g., the Release Notes on the installation CD-ROM.

☞   **When using the PLC program after an update, please make sure whether the update requires modifications in the PLC program, or whether the PLC program will continue to be executable without any restrictions**
For more information, refer to the Release Notes on the installation CD-ROM.

Software installation

3.5   Performing the update

The actual installation process for the Software update is initiated by the **Setup** routine (e.g. in the path **D:\V7xx\pncsw\disk1**).

The Setup comprises the standard installation of the **most current version of the software components** which may be executed on the PNC-P and the basic unit.

☞ **For a convenient installation, you should connect a mouse to the PC basic unit.**

**CAUTION
Possibility of data loss, damages to the machine and/or workpiece!
You should first complete all current processes before stopping any applications (e.g. BOF, CPL, ...) or services (NFS server, ...)!**

**Step
1** Finishing current applications
and services

Applications and **services** on the PC basic unit, which are linked to the PNC-P and have to be finished before calling up the Setup program on the CD, are shown on the task bar:
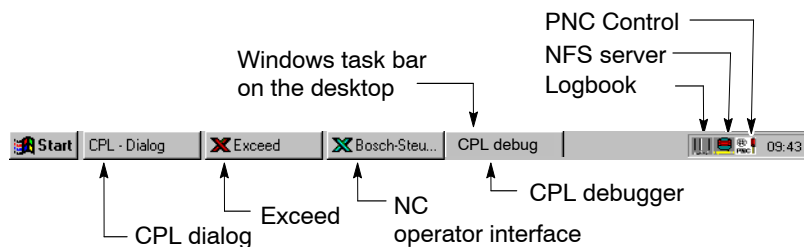
Finishing applications

★ The following applications should be ended prior to the update:

● Close **NC operator interface**
   Press keys **<ALT> + <F4>** and confirm the message
   "This will end your MMI-Application" by hitting *OK*.

● Close **Exceed**:
   Press keys **<ALT> + <F4>** and confirm the message
   "This will end your X Window session" by hitting *OK*.

● Close **CPL Dialog**:
   Press keys **<ALT> + <F4>** and close the application.

Software installation

- Close **CPL Debugger**:
  Press keys **<ALT> + <F4>** and close the application.

- close all other **active programs (Windows applications, ...)**:
  Press keys **<ALT> + <F4>** and close the respective application.

Initiate a PNC RESET

Before the update, the entire memory of the PNC-P adapter must be cleared in order to ensure that the new program can be loaded when booting.

★ Select the following menu from the PNC Control: *Commands* ▶ *Reset PNC*

or click on [R]

Step
2⟍ Calling the Setup program

★ Insert the installation CD into the CD-ROM drive, start the Windows Explorer, and select the CD-ROM path

D:\V7xx\pncsw\disk1

and the "**Setup.exe** "program. Start the program with a double-click.
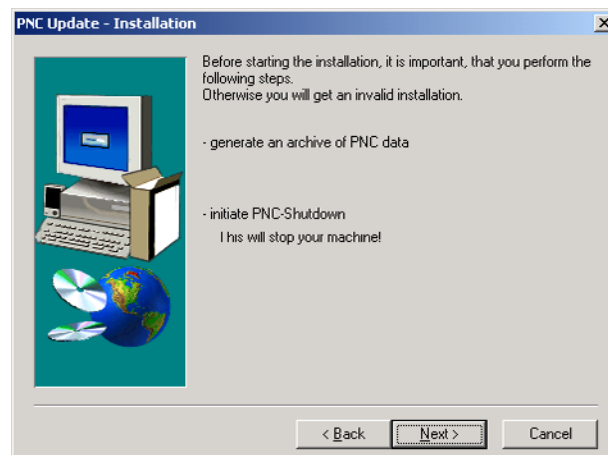
In the first information window, you are requested:
- to backup all data in an archive
- to shut down the PNC-P.

☞ **If you do not observe these instructions, the installation may fail.**

★ You may still cancel the installation at this point without making any changes to existing directories or files.
To continue, click on *Next*.

Software installation

Step
3 ⫟   Selecting the Setup type
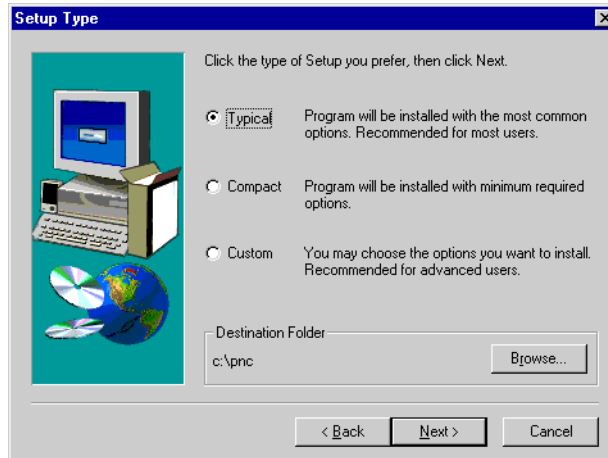
Select the installation directory

★   By selecting the directory name, you decide whether or not the old version is to be replaced.

Default directory: **c:\pnc**
To search for another directory, click on "Browse..".

Setup types

★   You may choose between three setup types:

- **Typical (Default)**
  Contains all relevant software components.
  This option requires only very few settings, and all programs necessary for a complete update will be installed**.**

- **Compact**
  Like "Typical Setup", however, without the logbook and documentation.

- **Custom**
  Using the "Custom" setup option, you can determine the installation components yourself. In this case, you should mark the components you want to install. Additional tools may be installed in another dialog using "Tools" (refer to table).

Software installation
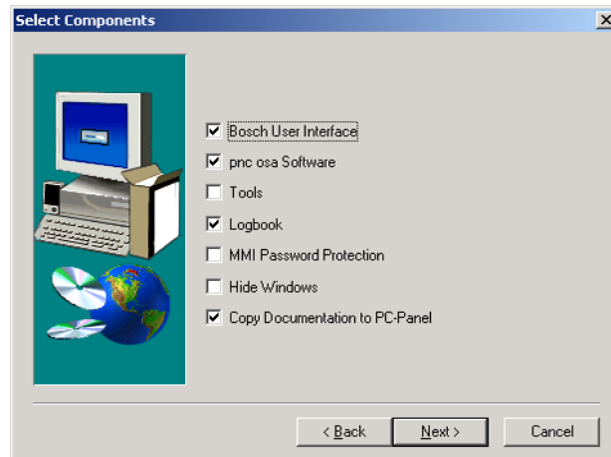
Designation	Description	Installation type		
		Typical	**Compact**	**Custom**
Bosch User Interface	PNC Control, BOF, INI files, CPL	✓	✓	✓
pnc osa software	PNC-P software	✓	✓	✓
Tools	▶ Logic Analyzer Logic analyzer	–	–	optional
	▶ Oscilloscope Axis oscilloscope	–	–	optional
	▶ Cpl Debugger Debugging of CPL and DIN programs	–	–	optional
Logbook	The logbook links the PNC error administration with the PC's event display.	✓	–	✓
MMI Password Protection	Password protection for directory access	–	–	optional
Hide Windows	Access to Windows desktop is denied	–	–	optional
Copy Documentation to PC Panel	Copy complete documentation to the PC basic unit	✓	–	✓

☞ **You should check at least the components "Bosch User Interface" and "pnc osa Software" in order to obtain an operative system.**

Software installation

Step
4 ⌐   Creating "Bosch PNC PC Panel"
      program group

> In the next step, a program group will be created for the PNC-P applica-
> tions. You may accept the proposed group name "Bosch PNC PC
> Panel".
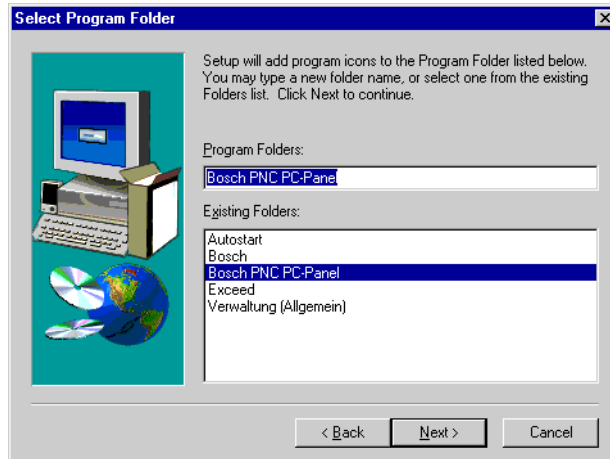
> ★   Click on *Next*.

Step
5 ⌐   Naming the PNC

> In the next step, the **symbolic name** of the PNC-P adapter will be de-
> fined. Each PNC-P can thus be identified by its own name.
>
> If the default name is changed, the system checks whether the new
> name is already available in the file "hosts" in the Windows system folder.
> If this is not the case, it will be entered in the file "hosts" in a user dialog,
> and you will be prompted to enter the IP address of the PNC-P adapter
> (also refer to initial installation, section 3.7).
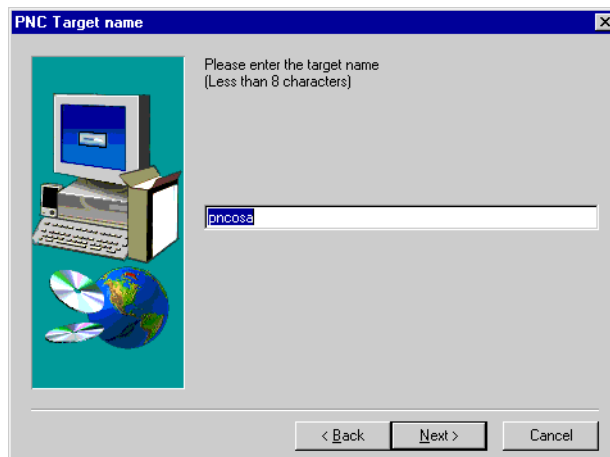
> ★   Click on *Next*.
>   The files are copied from the CD onto the hard disk.

Software installation

If the update also includes a new driver for the PNC-P adapter, this driver will be automatically copied to the proper directory when the installation has been completed. Reboot the system to activate the driver. In this case, the following message will be displayed:
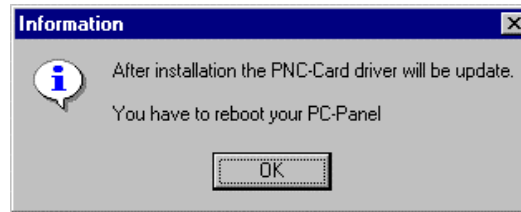
★ Click on *OK*.

The installation program creates the program icons as well as various information files in the **program group "Bosch PNC PC Panel"**:
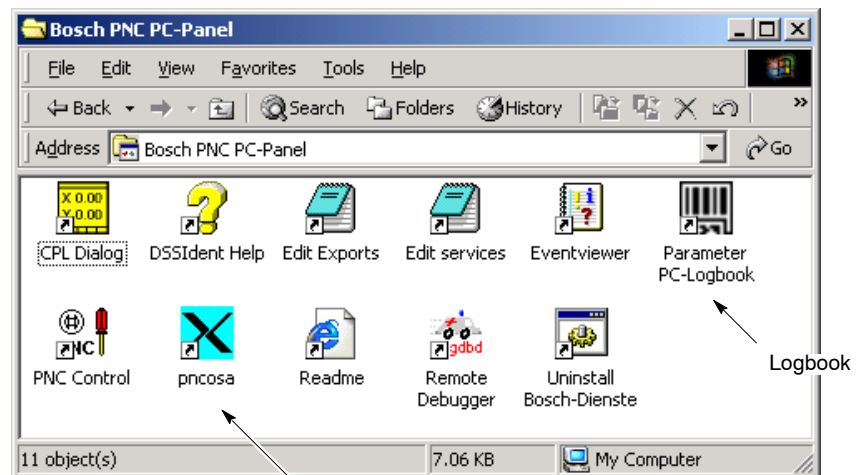
NC operator interface
(the icon is marked by the se-
lected symbolic name of the PNC)

★ Close the "Bosch PNC PC Panel" program group to continue.

Step
6⟩ Defining the Autostart

In the next step, you define whether or not the following components should be automatically started when the system is booted:

	Name	Description
✓	PNC BOF	NC operator interface
✓	CPL Dialog	CPL Dialog program

Delete the appropriate markings if the application should not be automatically started after booting.

Software installation
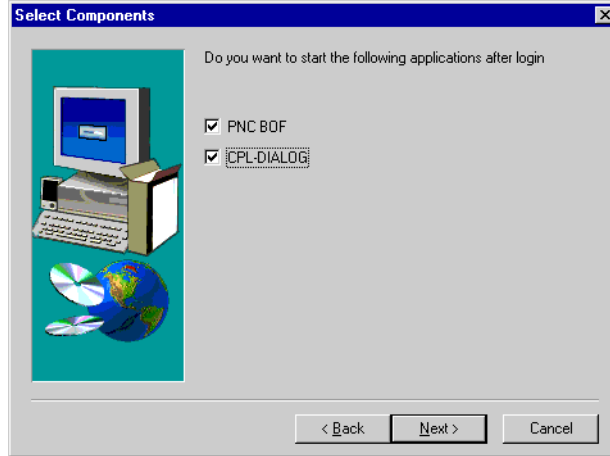
★   Click on *Next*.
Afterwards, the system displays a message that the "NFS Server" for
mounting the directories (default: c:\pnc\cncfiles and user FEPROM:
c:\pnc\<pnc_name>\usrfep) has been successfully installed on the ba-
sic unit.

Step
7   Finishing the Setup

★   Choosing "No, I will restart my computer later" will finish the installation
without rebooting the controller. Thus, you can first configure the PNC-P.
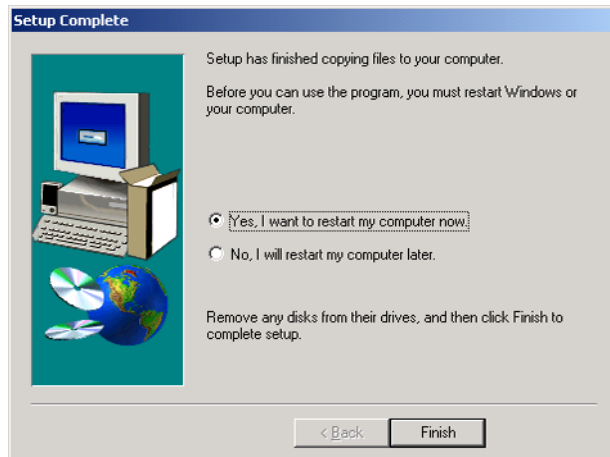
★   Hit *Finish* to finish the installation.

Software installation

Re-booting

When the system is booted:

- Windows is started
- a new driver of the PNC-P is activated, if necessary,
- the new PNC software is loaded into the PNC-P
- the PNC-P is started, and the Rexroth applications defined in the autostart group (PNC BOF, CPL Dialog) are also invoked.

After booting, the installation files are available in folder "pnc":
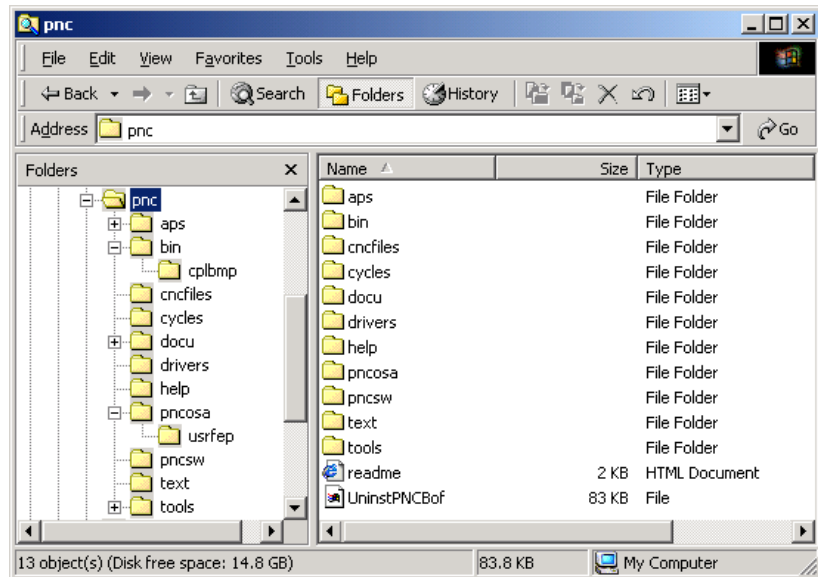
☞ **If the controller is not booted properly, you may additionally choose between various start-up options displayed in an additional selection window. For details, refer to section 5.1.**

★ First restore all data by selecting PNC Control, Option **Archive restore** (refer to next section, 3.6).

★ Then perform a soft RESET ![SR] using PNC Control in order to make the data available to the PNC-P (refer to section 4.4.5).

Software installation

3.6 Making the system operational

3.6.1 Restoring user data (Archive restore)

When the PNC-P operating system has been successfully installed, you may restore the data saved in an archive to the PNC-P.

☞ **Only those archives may be restored which had previously been created from the PNC.**

The following can be restored:
- User FEPROM (user data, PLC program, ...)
- the RAM file system of the PNC
- the MACODA parameters
- the tool table
- CPL variables
- Data modules

★ Select the menu sequence: *Commands* ▶ *Archive restore* or

click on ⬛⟶
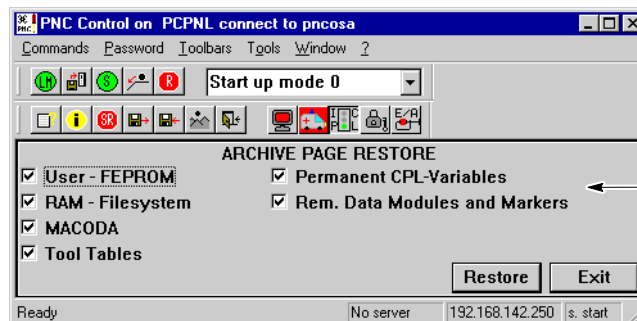
Options of the archived data

For a detailed description, refer to section 4.4.7

Please note the following for the **PLC program** after having restored previously backed-up data:
- Restored RAM file system:
  Boot the controller with the last active PLC program available in the RAM file system using Start up mode = 0 (default setting)
- Restored user FEPROM:
  Boot the controller with the PLC program stored in the user FEPROM using Start up mode = 2 or 6
- The PLC program must be executable, however, it may be necessary to modify the program after a software update. For more information, please refer to the Release Notes on the installation CD-ROM.

Software installation

☞ **When using the PLC program after an update, please make sure whether the update requires modifications in the PLC program, or whether the PLC program will continue to be executable without any restrictions.**
For more information, please refer to the Release Notes on the installation CD-ROM.

★ Then perform a soft RESET using PNC Control in order to make the data available to the PNC-P (refer to section 4.4.5).

Software installation

3.6.2   Setting up the logbook

The Logbook is installed as a Windows service:

- Initial installation requires administrator privileges.
- This service is automatically started when the PC basic unit is booted.
- The parameter settings may be activated, and the service can be stopped, via a symbol in the task bar.

☞   **No settings of the Logbook are changed by an update. In the event of a new installation, the logbook has to be configured.**

Functions

The logbook builds up a network link with the PNC and signs up with the error administration of the PNC:

- The status stored in the PNC error administration is retrieved for the filter classes selected in the filter setting of the logbook and displayed in the event display of the PC basic unit.
- The software release version of the PNC is scanned and displayed in the event display under "Source".
- The PNC informs the Logbook whenever errors, warnings, messages, and instructions occur, or are deleted. Furthermore, the system is scanned cyclically for system errors in the PNC.
- The establishment and disconnection of the link between the PC control panel and the PNC is also recorded in the Logbook. This entry also lists the hardware components (e.g. Ethernet address) of the PNC.
- The data supplied is presented chronologically in the event display (refer to page 3–19).
- The error texts are available in German and in English (Default setting: English).

Calling up the logbook

The input window of the Logbook is automatically started when the system is booted.
Open the input window while the system is running by a left click on the

PC Logbook icon   in the task bar.

Task icon "PC Logbook"

or with

- *Start ▶ Programs ▶ Bosch PNC PC Panel ▶ PC Logbook*

Software installation

Parameter settings
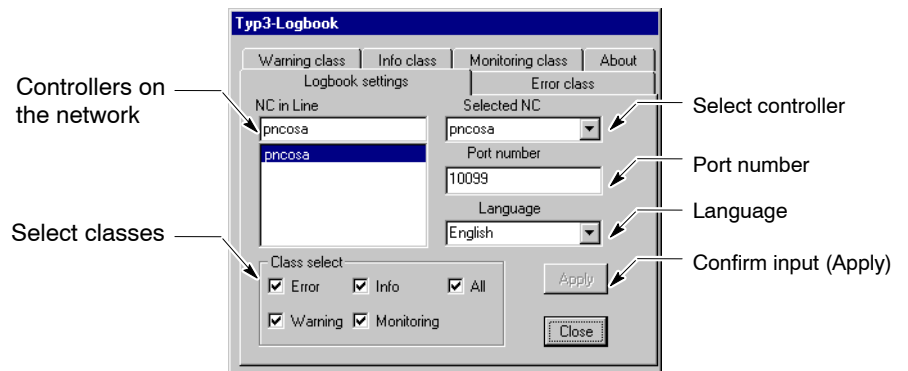
Parameter settings	Meaning
NC in Line	Shows the controllers on the network selected for logging events in the Logbook (symbolic names of PNCs).
Selected NC	Select another controller for logging events in the Logbook. Delete controllers: first select controller in the field "Selected NC", then delete with <Del> key.
Port number	The port number is always assigned to the name of the controller in the field "Selected NC". It usually has the value 10099.
Language	Change over the language of the error texts in the event display (Default setting: English).
Class select	Define the event classes to be logged: • Error • Warning • Info • Monitoring Filters may be set within the classes in order to restrict the display to certain statuses or errors (refer to next page).

Hit *Apply* to accept all settings.

☞ **You should log all changes possibly made to the logbook settings at any time in order to draw the proper conclusions concerning all subsequent error messages.**

Software installation

Filter settings

Filters may be defined for any class of event in order to restrict the events to be logged.

Fault
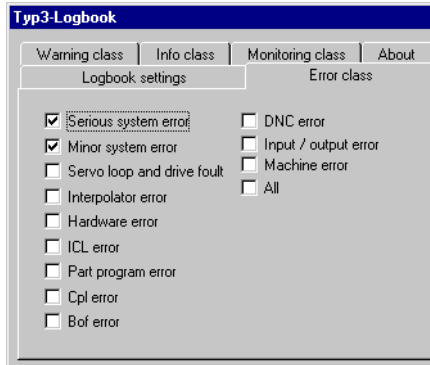
Warnings
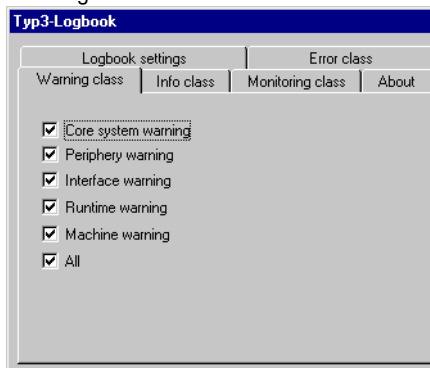
Messages
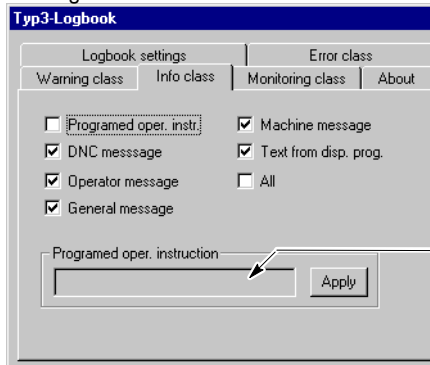
For "Programed operating instructions" furthermore a search string may be entered.

Monitoring
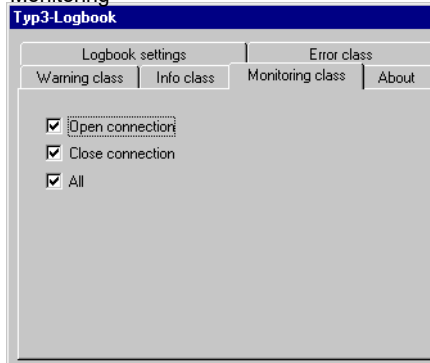
Software installation

Visualization

To display the logged events in the logbook, select:

Start ▶ *Programs* ▶ *Administration (General)* ▶ *Event display*

★ Select "Application" for the logbook settings.
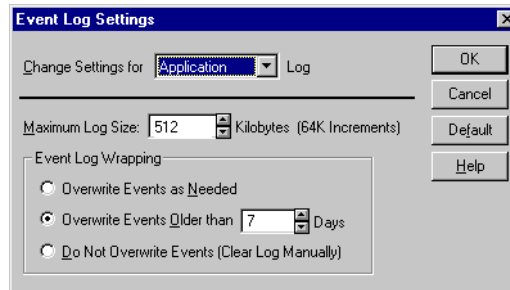
The event display lists the events occurring in chronological order, according to the filter setting.

Example of an event display:

For detail information, double-click on an event in the list:
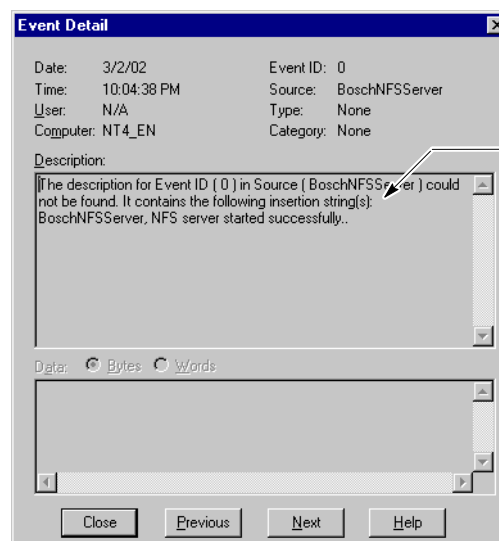
Software installation

The following information is available:

Feature	Meaning
Date, time	Date and hour of the event
User	Active user
Computer	Name of PC control panel
Event ID	Error number (1..n):
Source	Name of controller_software version
Type	Name of class the event belongs to
Category	Internal feature
Class	Detailed information on "Type"
Text	Text message explaining the event
Time	Date and hour of the beginning of the event
Channel	Channel on which the event occurred
Status	Internal feature
Binary data	Number of data, software version, text number, auxiliary text number, variable data for the error text (parameter)

☞ **The logs of all areas (system, security, application) can be saved, however, only the current log selected will be saved.**

To save the log, select in the event display:

Protocol ▶ *Save as*.

The log can be saved as event files (*.evt) or text files (*.txt). Log files may be scanned and displayed by the event display, whereas text files can be viewed in a text editor.

Software installation

3.6.3   Setting up the application software

Updating APS, CPL,...

On the installation CD you will find applications such as CPL cycles, APS, which are not installed automatically.

For more information on the installation, refer to the Readme files on the CD-ROM. Please observe the installation instructions given in these files.

Setup folder of the
PNC software CD, Version 7.3.5
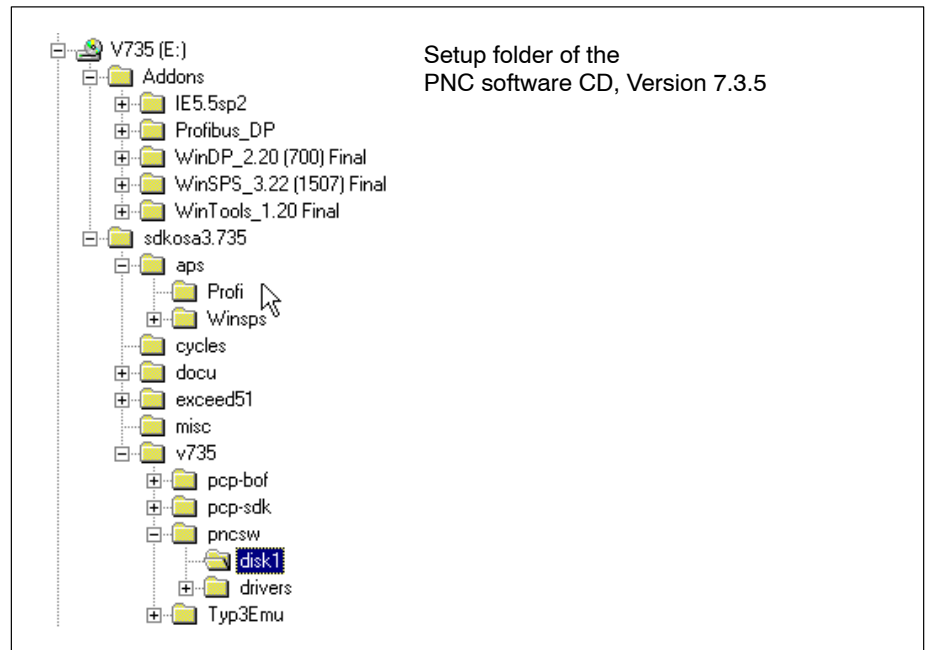
NC operator interface and CPL dialog

If no automatic start of the NC user interface and CPL dialog has been selected during installation, you should start these applications with the menu sequence:

- *Start* ▶ *Programs* ▶ *Bosch PNC PC Panel* ▶ *<PNC name>* (Default: "pncosa"

and

- *Start* ▶ *Programs* ▶ *Bosch PNC PC Panel* ▶ *CPL Dialog*

Software installation

3.7   Initial installation

An initial installation contains additional queries and instructions. This special case will only be present of no PNC-P adapter has been installed before on the PC basic unit.

Condition

The following has to be installed on the PC basic unit:

- Windows NT and Service Pack 5 or higher, or
  Windows 2000 and Service Pack 2
- TCP/IP protocol
- Exceed 5.1 (X-Server for NC user interface (BOF), may also be installed later).

Any PNC-P software components that might exist on the hard disk have to be uninstalled as follows:

- First, stop all active services via:
  Start ▶ *Programs* ▶ *Bosch PNC PC Panel* ▶ *Uninstall Bosch-Dienste (Services)*

- Then uninstall PNC-P software with
  Start ▶ *Control panel* ▶ *Software* ▶ *Bosch PNC PC Panel BOF* ▶ *add/delete*.

Windows 2000 message

When fitting a PNC-P adapter for the first time to a PC with Windows 2000, Windows will detect the new hardware when the PC is booted.
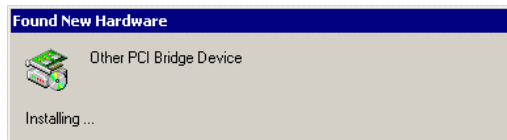
The hardware wizard is opened automatically, however, it has to be terminated at this point because the necessary PNC-P driver will not be available before the PNC-P software has been installed.

Software installation
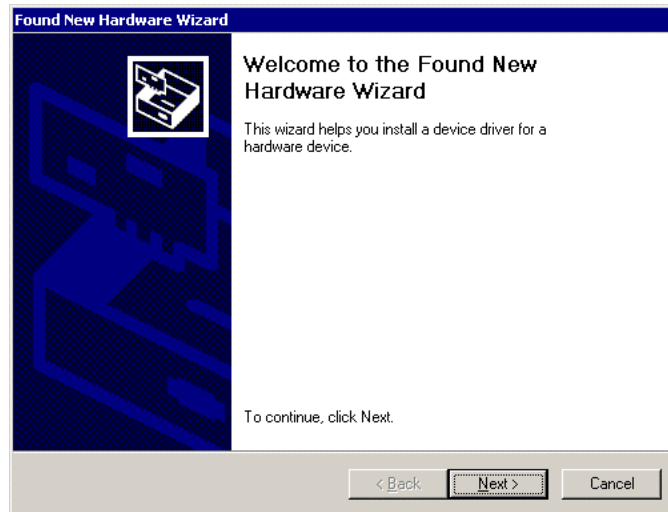
★   Click on *Cancel*.

Step
2 ◻ to Step 6 ◻ of the update installation process

First, you should perform installation steps 2 to 6 of the update installa-
tion (refer to section 3.5, starting on page 3–7).
During the installation, **additional queries** and **instructions** are dis-
played, as compared to the update.

Checking Exceed

In step 5 (page 3–10) the system checks whether the X-Server (Exceed
5.1) has been installed for the "NC user interface" application.
If the X-Server is missing, the following message will be displayed:
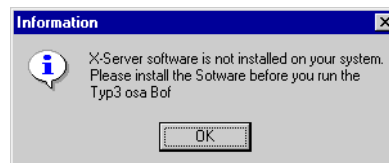
If the NC user interface PNC-BOF is started by the autostart group al-
though Exceed has not been installed, the following message will be dis-
played:
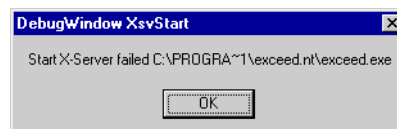
★   Install Exceed 5.1 from your CD-ROM. This installation may still be car-
ried out once the setup has been completed (refer to section 3.8).

Software installation

Setting the IP address of the PNC-P adapter

Furthermore, you assign a symbolic name to the PNC-P in step 5 (page 3–10). This name, as well as the related IP address, are automatically entered into the "**hosts**" file (in the Windows folder). The file will be generated as follows:
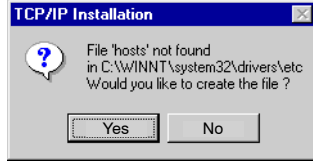
★ Press *Yes* to create the "Hosts" file.

Afterwards, the installation suggests the following IP address for the PNC-P adapter: 192.168.142.250.

☞ **The PNC-P forms its own subnet that has to be different from the existing subnet.**

Example
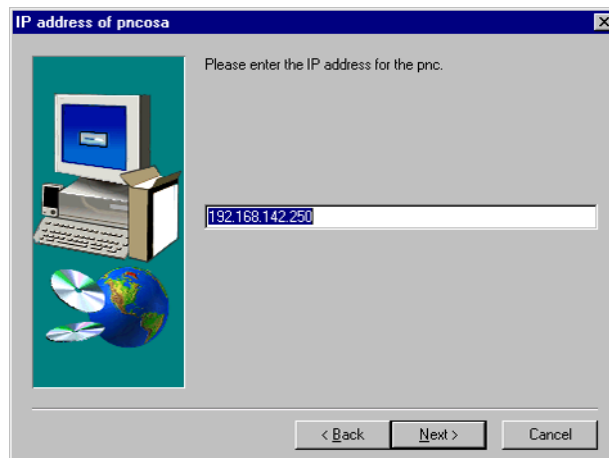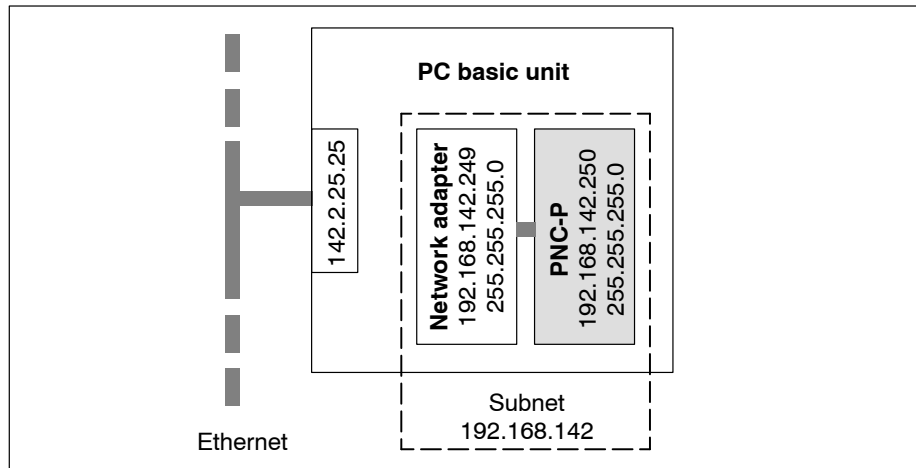
★ Click on *Next*.

Software installation

A message will be shown that the PNC-P controller has been added to the network, and that the network adapter for the IP address 192.168.142.249 has to be installed after the setup.

Windows NT:

Windows 2000:
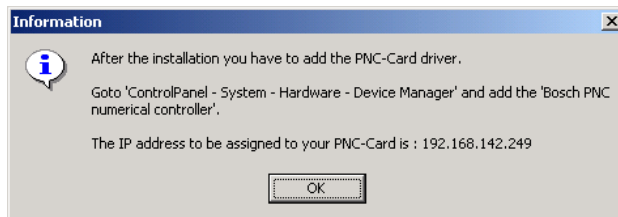
★   Press "OK".

Afterwards, you may choose whether Windows should be booted with automatic user log-on, i.e. without a repeated user input.
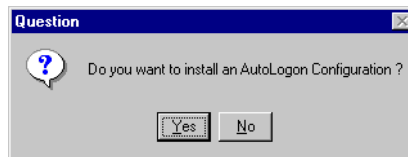
☞   **Only those users can be entered in the automatic user-logon who have been set up including a valid password in the Windows user manager windows.**

Software installation

Step
7 Finishing the Setup

The network adapter for IP address 192.168.142.249 has to be installed before the system is rebooted.

★   Therefore, you should accept the default setting "No, I will restart my computer later" and click on *Finish*, to make sure that the system is **not** booted.
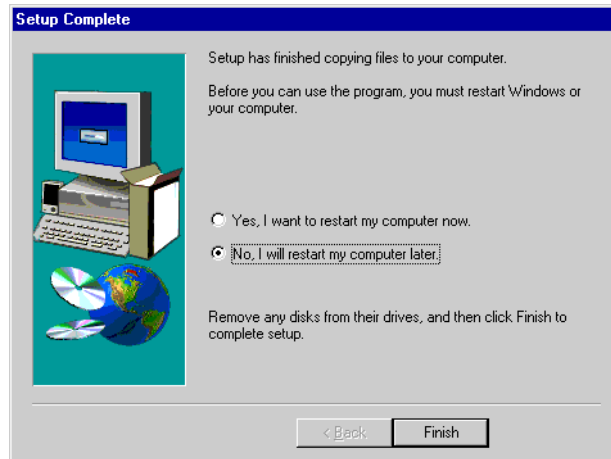
☞   **The procedure for installing the network adapter in Windows NT differs from that in Windows 2000.**
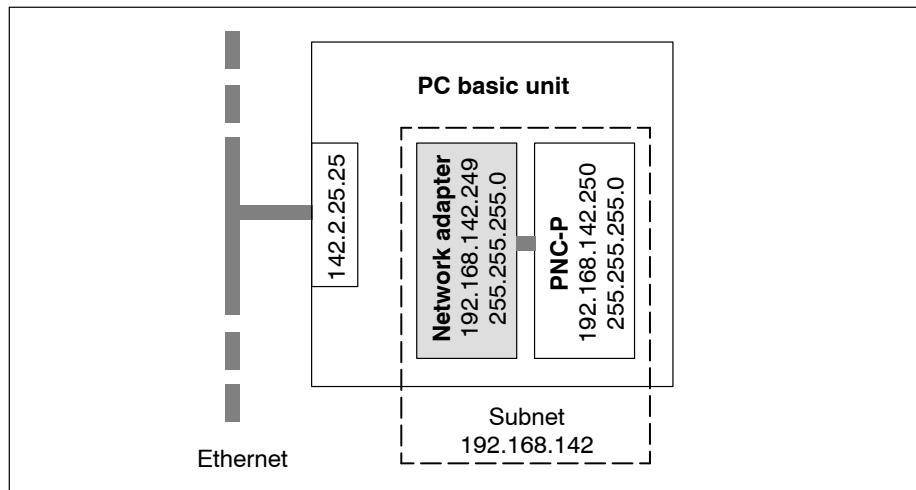
Software installation

Windows NT

Step
8   PNC-P adapter sign-on

★ To install the network adapter, select:
Start▶ *Settings* ▶ *Control panel*▶ *Network*▶ *Network adapter*▶
Add...
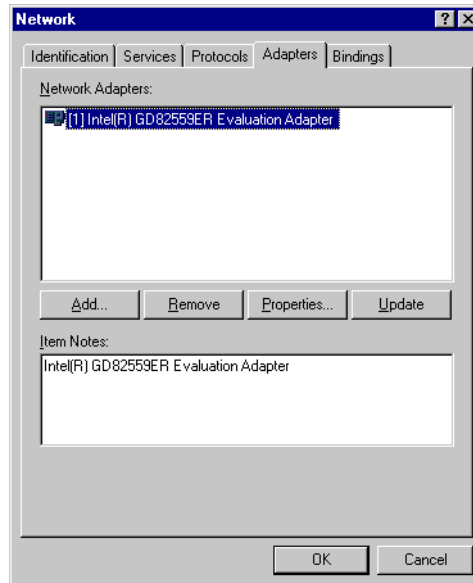
The network adapter for the PNC-P controller (Bosch PNC numerical
controller) is not yet available on the system. Therefore, you should se-
lect the path for the driver file with the command button *Floppy disk...* .

★ Enter the following path for the drivers for the network adapter:

c:\<Installation folder>\drivers
(Default setting: c:\pnc\drivers)
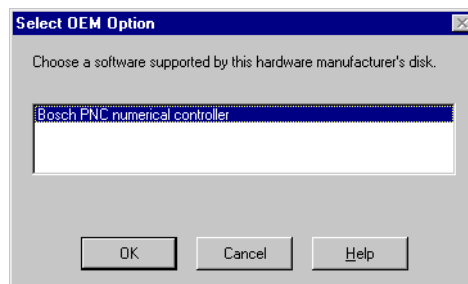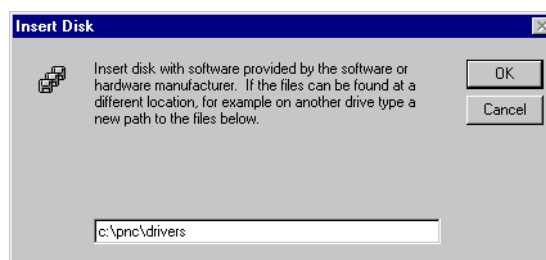
Software installation

★   Accept the driver "**Bosch PNC numerical controller**" by hitting *OK*.
The system returns to the "Network" window, the PNC-P adapter has
been added as a network adapter.
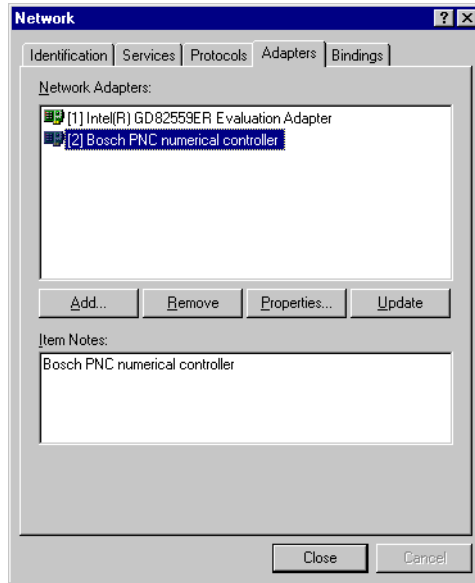
★   Click on *Close*. The following window is opened in order to configure the
new network adapter.

Step
9   Setting the IP address
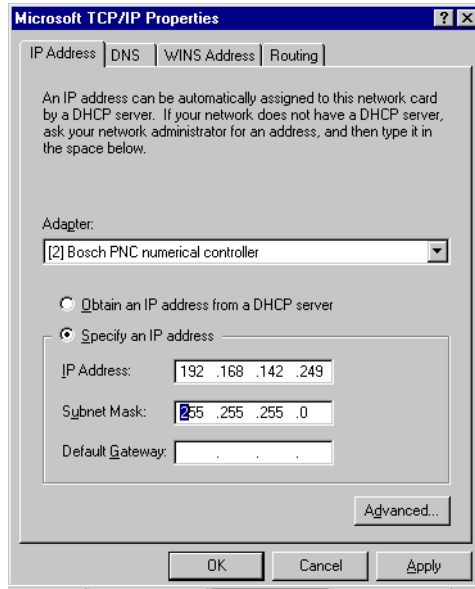
Software installation

★   Select the "Bosch PNC numerical controller" as network adapter and en-
ter the following data for the network adapter (default setting):

IP address :   **192.168.142.249**
Subnet mask: **255.255.255.0**

☞   **The IP address of the network adapter and the PNC controller must
be located in a separate subnet together with the internal IP ad-
dress of the PNC controller (Default: 192.168.142).**

★   Furthermore, you should select *Routing*, option *IP forwarding acti-
vated*.

If necessary, you can find the internal IP address of the PNC-P controller
in the window "Network", option *Network adapter* ▶ *Bosch PNC numer-
ical controller* ▶ *Properties* ▶ *Continue*.
The IP address of the network adapter set above may be viewed in the
window "Network", option *Protocols* ▶ *TCP/IP* ▶ *Properties*.

★   In order to activate all settings, you should restart your system, as de-
scribed on page 3–35.

Software installation

Windows 2000

Step
8☞   PNC-P adapter sign-on

★   To install the network adapter, select:
Control Panel ▶ *System* ▶ *Hardware* ▶ *Device Manager*
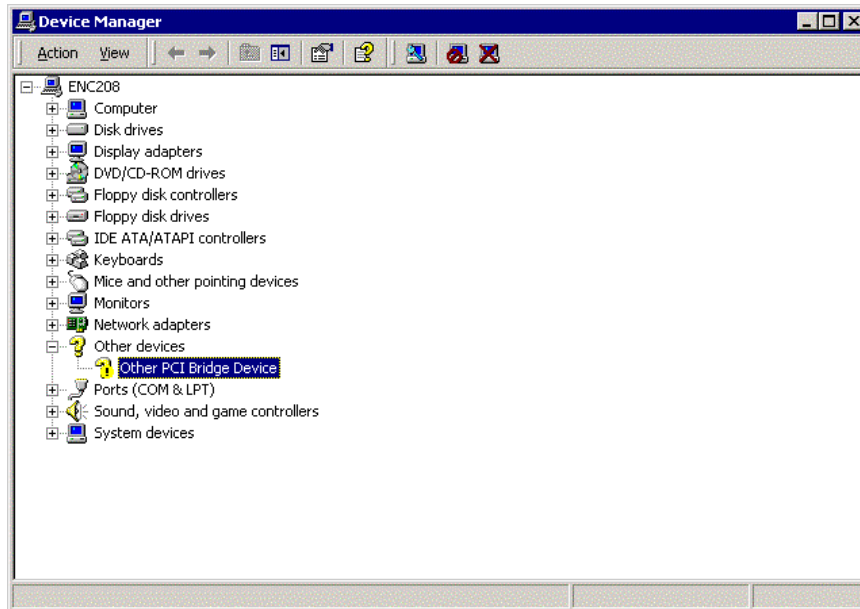
★   Click on "Other PCI Bridge Device" and call up the properties by *Action*
▶ *Properties*.
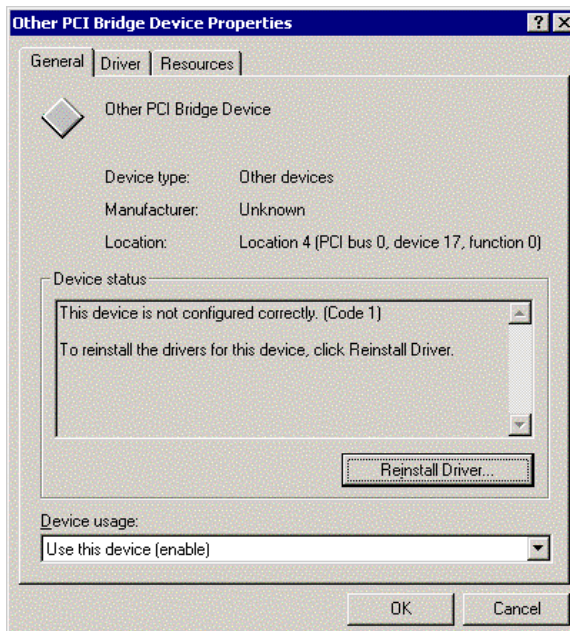
★   Click on *Reinstall Driver* to call up the driver wizard:

Software installation

★   Hitting *Next* will open the following window:
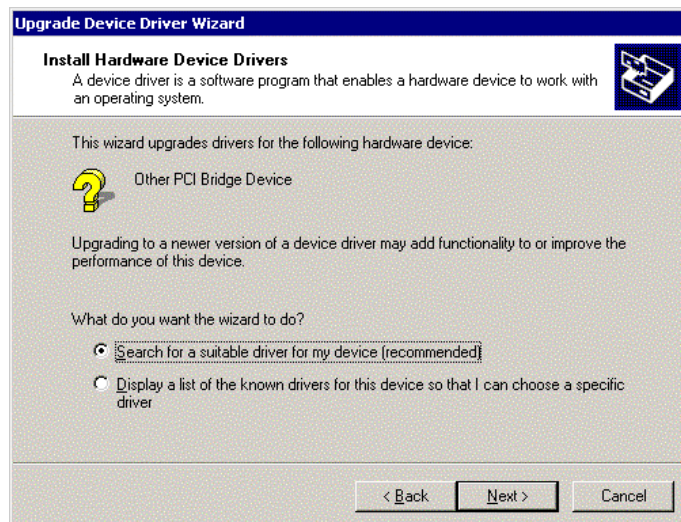
★   Activate the driver search as shown. Hitting *Next* will open the next win-
dow.

Software installation
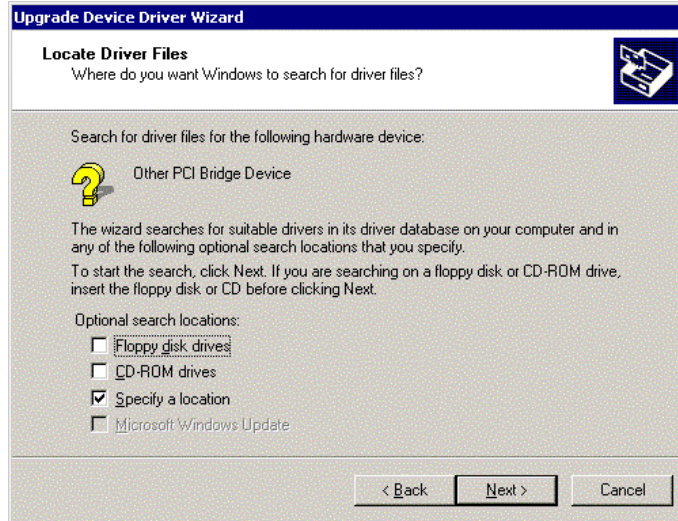
★   Activate "Specify a location" and enter the following path for the driver:

c:\<Installation folder>\drivers
(Default setting: c:\pnc\drivers)
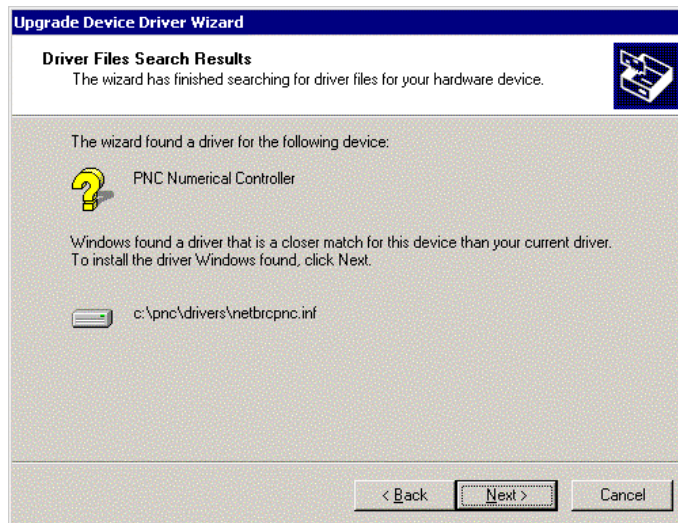
Software installation
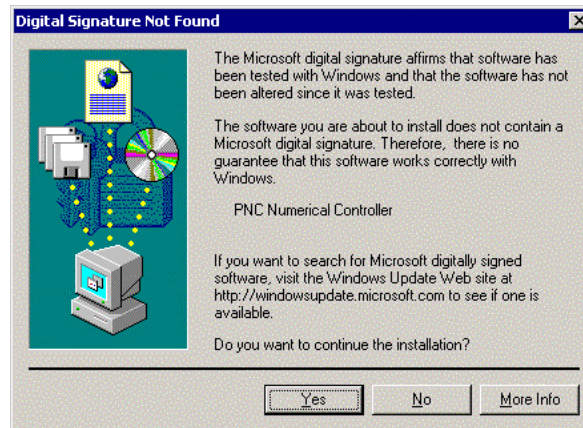
★   Confirm by hitting *Yes* in order to install the driver.

If the error message "The device cannot start. (Code 10)" is displayed in
the last window of the driver wizard, the PNC Control Windows service is
already active. In this case, you should reboot your PC after hitting *Fin-
ish*.
If no error is displayed, rebooting is not necessary after *Finish*. The net-
work link can be configured immediately afterwards.

Software installation

Step
9

Setting the IP address

★   Select *Start* ▶ *Settings* ▶ *Network and Dialup Connections*.
Select *Local Area Connection 2* and click on *Properties*.
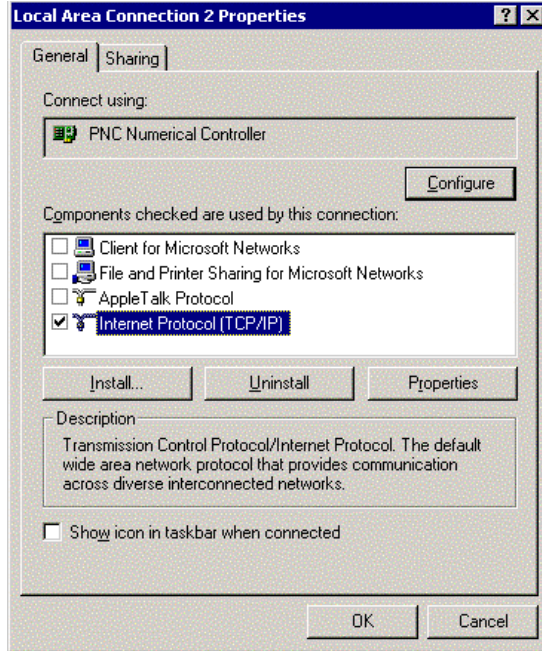
★   Only select "Internet Protocol (TCP/IP)" and click on *Properties.*
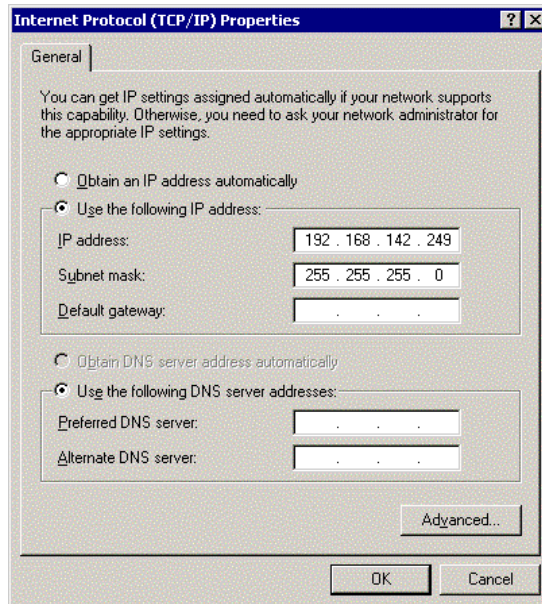
Software installation

★   Enter the following data for the network adapter (default setting):

IP address :   **192.168.142.249**
Subnet mask: **255.255.255.0**

☞   **The IP address of the network adapter and the PNC controller must
be located in a separate subnet together with the internal IP ad-
dress of the PNC controller (Default: 192.168.142).
"IP forwarding" will be automatically activated in Windows 2000.**

Step
10   Re-booting your system

★   In order to activate **all** settings, you should restart your system.
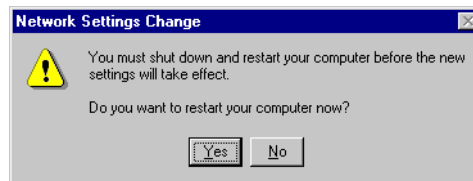
★   Confirm by hitting *Yes*.

When Windows has been booted, the following services and applica-
tions must be active (standard installation), which can be recognized by
the icons in the task bar:
●   NFS Server
●   Exceed
●   PNC BOF
●   CPL Dialog
●   Logbook
●   PNC Control

☞   **If the controller is not booted properly, you may additionally
choose between various start-up options displayed in an addi-
tional selection window. For details, refer to section 5.1.**

★   Set up your application software, refer to section 3.6.3.

Software installation

3.8   Installing Exceed

Exceed 5.1 has to be available on the PC basic unit as an X Server for the "Bosch Standard user interface" application. If Exceed has not yet been installed, you should proceed as follows.

Starting the installation

★ Call up the **Setup.exe** program located in path D:\EXCEED51\WINNT on your CD-ROM.

The software may be installed
- completely (with new installation only) or
- as an update.
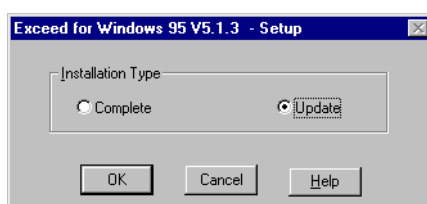
Please accept all default settings in the dialog windows and follow the instructions of the installation program.

Defining a password

When the installation is complete, you will be prompted to enter a password. The password prevents unintentional or intentional modifications to the Exceed settings by unauthorized persons.

A password may **only** be defined **in the course** of the installation process.

Testing Exceed

The program is automatically configured once the installation has been completed.

PNC Control

4　PNC Control

PNC Control is a monitoring program of the PNC-P. The information received from the controller is logged and can be displayed on request.

The program has been installed as a Windows service on the PC basic unit and is automatically started when the PC is booted.

When PNC Control is active, the task bar will contain the icon ⬛.

4.1　Opening the PNC Control window

In order to display the information received from the controller, the PNC Control window must be opened via:

- *Start* ▶ *Bosch PNC PC Panel* ▶ *PNC Control*
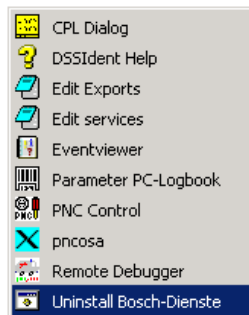
　　or

- by double-clicking on the icon ⬛ in the task bar

　　Task icon "PNC Control"

　　or

- right-click on the icon ⬛ in the task bar.
  In this case, a context menu will be opened for controlling the PNC Control (refer to section 4.2).

PNC Control

4.2 Context menu

Right-clicking on the icon ⬛ in the task bar will open the context menu. This menu offers the following options for controlling the PNC Control:

Commands	Meaning
View	Opens the start screen of the PNC Control window. In this window, the initial statuses of the PNC-P can be tracked, and control inputs can be set for the PNC controller. Changes are password-protected.
Help	Calls up the online help function of PNC Control.
Exit	Quit PNC Control. The controller continues to be active, even if PNC Control is exited. This function is password-protected and should not be used in normal operation. In the event of faults, data may be lost, because back-ups can no longer be made. Restarting PNC Control will immediately return the current status of the PNC-P.

4.3 Control and operating elements

When PNC Control has been opened, the following start screen will be displayed, which contains the key operating and diagnostics displays of the PNC-P. Many functions are password-protected and thus protected against unauthorized access. Inaccessible functions appear dimmed.
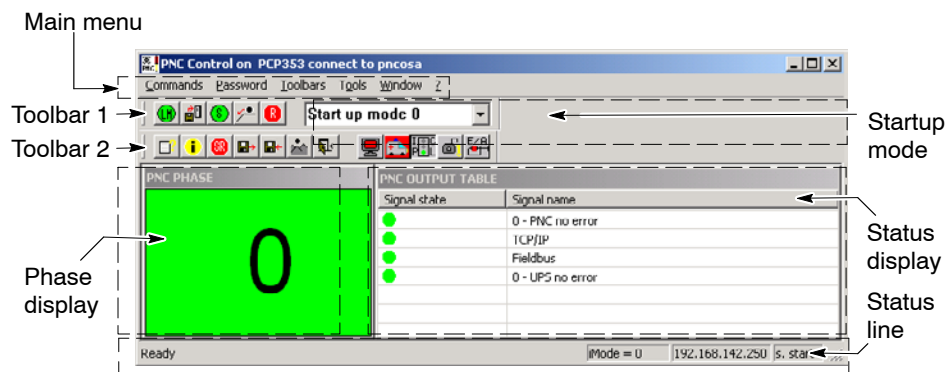
Window size

The window size can be changed in any direction using the mouse pointer. The default size set up during installation is restored by selecting menu item:

Window ▶ Default size.

PNC Control

4.3.1   Main menu

The main menu provides access to the control and monitoring functions for the PNC-P.

Menu group	Commands	Access via icon	Meaning
Commands			This group contains control commands for the PNC-P. Access to these commands is password-protected, thus preventing unauthorized interventions.
	Load Monitor		Loads and starts the monitor of the PNC-P.
	Download PNC		Loads the operating system software from the PC basic unit to the PNC-P in monitor operation.
	Start PNC		Starts the PNC-P operating system.
	Shutdown PNC		Controlled shut-down of the PNC-P. All files open in the PNC-P are closed and saved in backup files, and the entire memory is deleted afterwards. The monitor and operating system have to be re-loaded before the unit can be operated again.
	Reset PNC		Hardware RESET of the PNC-P without data back-up! The monitor and operating system have to be re-loaded before the unit can be operated again.
	Save Filesys-tem		Creates backup files for the PNC-P, refer to section 5.1. By selecting "Download PNC" or rebooting the PNC-P, the contents of the backup files are taken over into the controller.
	Soft Reset		Soft RESET of the PNC-P and subsequent booting in preset start-up mode. All data remains stored in the PNC-P.
	Archive re-store		Restores application data by reading an archive. This function is password-protected.
	Archive create		Saves application data in an archive.
	Mount		Sets up a mount directory for the PNC-P. The mount directory may be stored on the hard disk of the basic unit or on a network drive.
	PLC run/stop		Starts or stops the PLC (iPCL).
	Delete fixed inputs		Deletes the fixed signals in the iPCL.
	Output disable		Disables or enables the outputs of the iPCL.
	Display Crit. Errors		Displays the last critical system errors occurred when booting the PNC-P.

PNC Control

Menu group	Commands	Access via icons	Meaning
Password			This group contains commands for processing password properties.
	Set Level 0		Activates access to the lowermost level. This access remains available until 24.00 hrs of the current day, unless it is reset by specifying "Set Level 0". No access is granted for the functions of the "Commands" group.
	Change		Opens the window for changing passwords.
Toolbars			This group contains control commands for visualizing the two toolbars.
	Develop bar		Displays/hides toolbar 1 for developers.
	M.builder bar		Displays/hides toolbar 2 for machine manufacturers.
Tools			This group contains commands for independent applications.
	Remote Debugger		Starts the Remote Debugger as an independent application.
Window			This group contains control functions for the window properties.
	Hide Window		Closes the PNC Control window. Double-clicking on the icon in the task bar or selection via the context menu of the right-hand mouse button will re-open the window.
	Foreground		Toggles the PNC Control window between foreground and background.
	Default Size		Resets the PNC control window to its original size.
?			This group contains control information concerning PNC Control.
	Info about PNC Control		Current version of PNC Control.
	Module Version		Current versions of the PNC-P software modules.
	Software Options		Displays the software options applied (currently not used).
	Info Hardware		Returns the pc board number, the hardware version number and the serial number of the PNC-P adapter.
	Online Help		Starts the online Help function (as of Microsoft IE 5.0)

☞ **You may also call up individual commands using your mouse and toolbars 1 and 2.**

PNC Control

4.3.2   Toolbar

Various functions for operating and controlling a PNC-P are available by a simple mouse-click or shortcut in toolbar 1 and 2.

Toolbar 1 (developers)

Toolbar 1 contains 6 elements which are only active if the developer's password (level 2) has previously been entered.

☞ **The individual elements can be operated with the mouse or by means of shortcuts, i.e. by pressing <Shift> + <Function key> (F1 – F6).**

Loading and starting the monitor in the PNC-P (also refer to Section 4.4.1)

Loads the operating system software from the PC basic unit into the PNC-P in monitor mode.

Starts the PNC-P operating system.

Controlled shut-down of the PNC-P.
All files open in the PNC-P are closed and saved, and the entire memory is deleted afterwards. The monitor and operating system have to be re-loaded before the unit can be operated again.

Hardware RESET of the PNC-P without data back-up!
The monitor and operating system have to be re-loaded before the unit can be operated again.

Start up mode 0 ▼   Defines the start-up mode for the PNC-P (refer to Section 4.4.3).
The PNC-P will be booted in this mode after a soft RESET or a restart. Right-clicking on the arrow symbol within the window will display information concerning the start-up mode setting. A new mode selection is immediately transmitted to the PNC-P.

PNC Control

Toolbar 2 (set-up personnel)

Toolbar 2 comprises 12 elements.

☞ **The individual elements can be operated with the mouse or by means of the function keys <F1> – <F12>.**

Starts the online help function

Displays the current versions of the PNC-P software modules.

The following elements are only active if the machine manufacturer's password (level 1) has previously been entered.

Soft RESET of the PNC-P and subsequent booting in preset start-up mode. All data remains stored in the PNC-P (refer to section 4.4.5).

Restores application data from an archive. This function is password-protected (refer to section 3.6.1).

Saves application data in an archive (refer to section 3.4).

Sets up the mount directory for the PNC-P (refer to section 4.4.8).

Quits PNC Control. The PNC-P continues to be active, even if PNC Control is exited. This function is password-protected and should not be used in normal operation. In the event of faults, data may be lost, because back-ups can no longer be made.

Activates the remote mode in order to control a PNC-P on a remote PC (currently not active).

Starts the remote debugger. The debugger is an independent application that is started as a process by selecting this option.

Starts or stops the PLC (iPCL) (refer to section 4.4.11).

Disables or enables the outputs of the iPCL (refer to section 4.4.12).
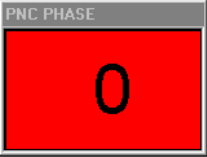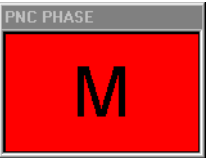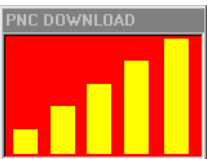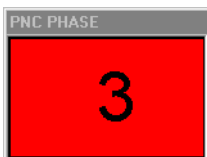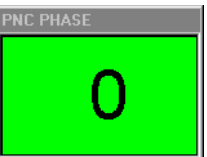
Deletes the fixed signals in the iPCL (refer to section 4.4.13).

PNC Control

4.3.3   Phase display

The phase display provides information concerning the operating status of the PNC-P:

Phase display	PNC status
PNC PHASE **0**	**No operation or error**: • PNC-P operating system has not been loaded. • Error when starting the PNC-P operating system • PNC-P running, but Ready failed. The display shows "**0**" on a **red** background.
PNC PHASE **M**	**Monitor operation**: The PNC-P is in monitor mode. The display shows "**M**" on a **red** background.
PNC DOWNLOAD (yellow bars)	**Loading process active**: The active loading process of the PNC-P operating system software is indicated by a periodic display of "**yellow bars**" on a **red** background.
PNC PHASE **3**	**Start-up mode**: Once it has been loaded, when the PNC-P operating system software is started, the individual start-up phases which are currently passed by the PNC-P, are indicated by numbers −3 ... 9. When the start-up has been completed (READY is available), "0" is displayed and the background color changes from **red** to **green**.
	Start-up mode, phase 2: The TCP/IP task is started and enabled
	Start-up mode, phase 4: • Starts and reads the MACODA • Preparations for starting the iPCL • The PROFIBUS-DP Server Task is started
	Start-up mode, phase 7: Mounting of the NFS filesystems entered in the start-up parameters or the "startup" file
	Start-up mode, phase 8: • Waiting for SERCOS interface start-up • Synchronization with PLC
PNC PHASE **0** (green)	**Normal operation** PNC-P operating system has been successfully booted. The display shows "**0**" on a **green** background.
PNC PHASE **?**	**After RESET**: PNC-P monitor not running. PNC-P software has not been loaded. The display shows "**?** " on a **red** background.

☞ **For details concerning the phases explained under start-up mode, please refer to the online help function.**

PNC Control

4.3.4   Status display

Error messages

In addition to the phase display, the status display shows error mes-
sages of the PNC-P together with a text.

PNC OUTPUT TABLE	
Signal state	Signal name
🟢	0 - PNC no error
🟢	TCP/IP
🟢	Fieldbus
🟢	0 - UPS no error

Line	Ready	Fault	Explanation
1	🟢 (green)		PNC-P initialized without any errors
		🔴 (red)	Initialization errors are shown in plain text. Refer to error messages in the Annex, page A−1
2	🟢 (green)		TCP/IP communication works
		⭕ (green)	TCP/IP communication interrupted
3	🟢 (green)		Field bus communication works
		🔴 (red)	Field bus communication interrupted
4	⚫ (gray)		No UPS (uninterruptible power supply) available
	🟢 (green)		UPS ready
		🔴 (red)	Battery pack defective or not charged.

PNC Control

Status display

| No server | 192.168.142.250 | s. start | |

Communication   IP address of the   Working mode
mode   linked PNC-P

The status display shows:

- the current **communication mode** of PNC Control:
  - No server
  - local
  - remote allowed
  - remote
- the **IP address** of the linked PNC-P. This address is provided as a parameter when the PNC Control is started.
- the current status of PNC Control:

m. stop	Monitor stopped
m. run	Monitor running
s. load	PNC-P operating system software is being loaded
s. load f.	The loading process of the PNC-P operating system software has been completed
s. start	The operating system was started, the PNC-P is running

PNC Control

4.4   Functions

4.4.1   Monitor operation

The **Monitor** is a program that offers minimum internal communication between a PNC-P and the "PNC Control" software program.

Monitor operation is necessary:

● when downloading the PNC-P operating system software, e.g. for a software update
● after RESET via PNC Control and loading the PNC-P software with subsequent start-up of the PNC-P.
● for a controlled shut-down of the PNC-P.

Monitor operation is indicated by "M" in the phase display of the PNC Control start screen.

Load Monitor

The PNC-P is switched into "Monitor mode".

CAUTION
Please note that the READY signal becomes low when the system is switched into monitor mode! This may influence the current operation of the PNC-P.

★   Click on ⬤ or select the menu sequence *Commands ▶ Load Monitor*.

This function is **password-protected**. Authorized persons receive the password from their local service department.

★   Enter the password (case-sensitive!) and confirm by hitting the Enter key.

PNC Control

All applications running in connection with the PNC-P are stopped if the system is switched into "Monitor mode". Please make sure that the applications have been properly stopped beforehand.
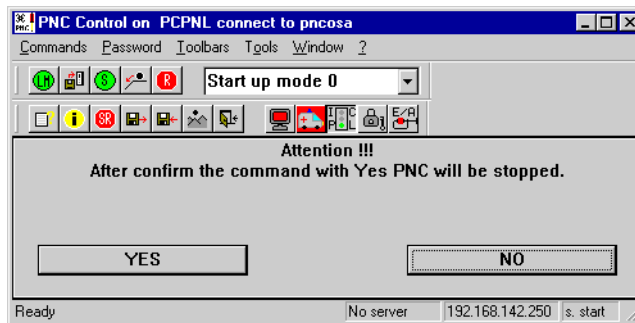
★   Press *YES*, if the PNC can be stopped without any problems.

Afterwards, the phase display will show **M** and the PNC Control window status line **m. run**.
The PNC-P is now in "Monitor mode" and is ready for the download of the PNC-P operating system software.
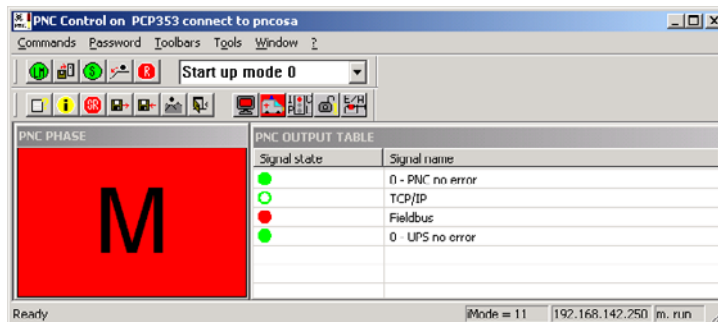
Monitor update

If it is necessary to update the monitor program, this update is carried out by selecting the software update included on the CD-ROM.

PNC Control

4.4.2   Loading the PNC-P operating system

Download

The operating system software for the PNC-P is loaded into the PNC controller from the hard disk of the basic unit by selecting the "Download" function. This process is initiated:

- during an update of the PNC-P operating system software
- whenever the Windows operating system has been booted
- after PNC reset
- after PNC shutdown

☞ **The download is automatically carried out whenever Windows has been booted.**

A **manual download** is performed in three steps:

1. Open the PNC Control window
2. Switch PNC-P into monitor mode
3. Download the PNC-P operating system.

Control displays during the download

| Sequence	Phase display PNC Control	Status line PNC Control	LED on PNC-P adapter
Reset PNC	"?" (red background)	m. stop	Ready: OFF Error: OFF TCP/IP: OFF ○
Switch PNC-P into monitor mode	M (red background)	m. run	Ready: OFF Error: OFF TCP/IP: OFF
Download the PNC-P operating system.	vertical bars are displayed periodically (red background)	s. load	Ready: OFF Error: OFF TCP/IP: ON ●
Download finished	M (red background)	s. load f.	Ready: OFF Error: OFF TCP/IP: OFF

PNC Control

Step 1 ☞   Opening the PNC Control window

★   Select, e.g. *Start* ▶ *Bosch PNC PC Panel* ▶ *PNC Control* (also refer to page 4–1)
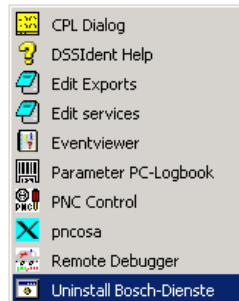
When PNC Control is started, the current status of the linked PNC-P is displayed. Therefore, the display in the "PNC PHASE" window may be different from the one shown.
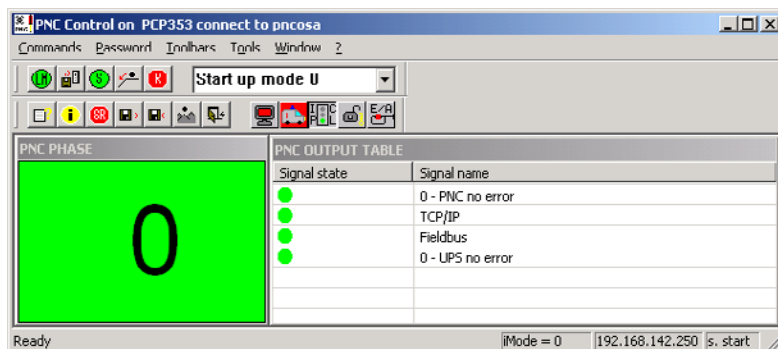
☞   **The download into the PNC-P is reserved to authorized persons, therefore, all of the following functions are password-protected.**

Step 2 ☞   Switching PNC-P into monitor mode

★   Click on or select the menu sequence *Commands* ▶ *Load Monitor*; in order to switch the PNC-P into monitor mode (refer to page 4–10).

PNC Control

Downloading the
PNC-P operating system software

★   Click on or select the menu sequence *Commands ▶ Download PNC*.

Yellow bars will be shown in the phase display during the loading pro-
cess. The loading phase is indicated by **s. load** in the status line.

☞   **The loading process has a duration of approx. 30 seconds.**
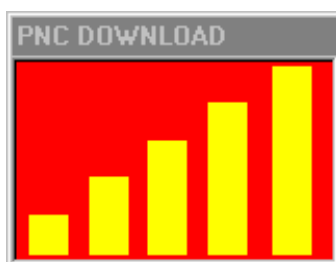
When loading is complete, the phase display will return to **M**, and the sta-
tus line to **s. load f**.
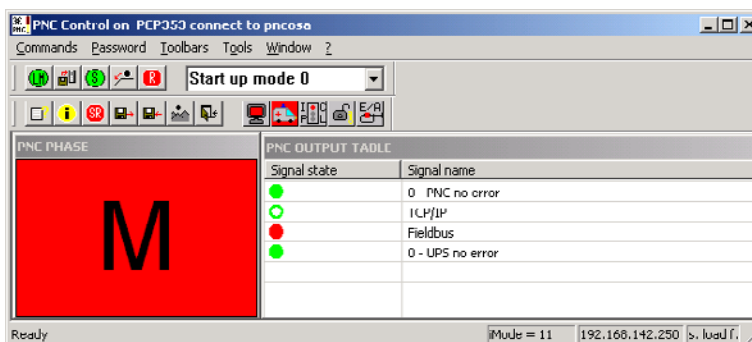
Even if loading has been completed, the PNC-P is not yet ready again:

●   the "Ready" LED on the PNC-P adapter is **off**.
●   the PNC-P operating system has not yet been started.

PNC Control

4.4.3   Start-up mode

Before starting the PNC-P operating system, a start-up mode is selected in the PNC Control window. This mode defines the way in which the PNC controller is started.

☞   **CAUTION**
Loss of data or disturbed functions!
Switching the start-up mode to positions other than "0" is re-served to service purposes and specifically trained service tech-nicians!

Settings

Start-up mode "0":   Switch position for normal operation.
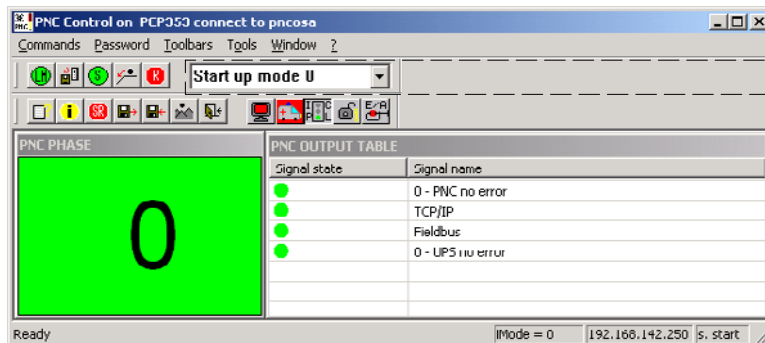The existing filesystem is retained, and is checked during the start-up. If the root filesystem is defective and cannot be automatically repaired, the controller will not start up and show "critical system error". During the next start-up, a new, empty filesystem is automatically generated.

Start-up mode "1":   The PLC (iPCL) remains in STOP condition after start-up, and the PLC user program is not executed.
The permanent data modules of the soft PLC (KNS) are deleted. Other-wise, the behavior is the same as start-up mode 0.

Start-up mode "2":   The PLC program in the root filesystem is deleted and loaded again from the user FEPROM. Debug mode, otherwise as start-up mode 0.

Start-up mode "3":   Start-up is guaranteed.
The controller is booted with a minimum configuration, independent of the MACODA parameter settings. The controller is set to minimum memory requirements, the PLC is not started, and the field bus remains deactivated. Furthermore, the init strings defined in MACODA are not used.
Thus, an incorrect configuration of the machine parameters can be by-passed which prevent a system start-up. Otherwise as start-up mode 0.

PNC Control

Start-up mode "4":   Not relevant for the PNC-P.

Start-up mode "5":   Not relevant for the PNC-P.

Start-up mode "6":   For initial start-up of a controller that has just been installed.
A new root filesystem is generated, and the PLC program and all necessary data are loaded from the user FEPROM.

☞   **CAUTION**
Loss of data!
Start-up mode "6" deletes all data of the old filesystem. You should not use this setting unless all important data (MACODA parameters, SERCOS files, etc.) have previously been saved in the FEPROM filesystem "usrfep".

Start-up mode "7" to "15":   This range has been reserved for internal purposes:

"8":   Similar to start-up mode 9. The PLC is running.

"9":   Debug mode
The hardware is initialized, the complete software is loaded. The PNC-P waits for debugging commands.

"11":   Debug mode
Activates the PNC-P monitor and loads individual software modules, if missing.

"13":   Debug mode
Deletes all software modules that were loaded later.

"15":   Debug mode
Activates the PNC-P monitor. The PNC-P communicates with the Debug PC via a virtual UART.

PNC Control

4.4.4   Starting the PNC-P operating system

Requirements

Starting the PNC-P operating system is subject to the following requirements:

- the operating system software has been loaded into the PNC-P
- the PNC-P is in **monitor mode**
- the proper **start-up mode** (refer to page 4–15) has been preset:
    - for an **update**:
      Start-up mode set to "0" prior to first start-up.
    - for an **initial installation**:
      Start-up mode set to "6" prior to the first start-up (when the system has been successfully started up, you should reset the start-up mode to "0").

If no PNC-P operating system has been loaded, this may be due to one of the following reasons:

- **Download** of the PNC-P software not performed after an update.
- **RESET** PNC-P.

☞ **After a soft RESET, the PNC-P will be automatically started up again.**
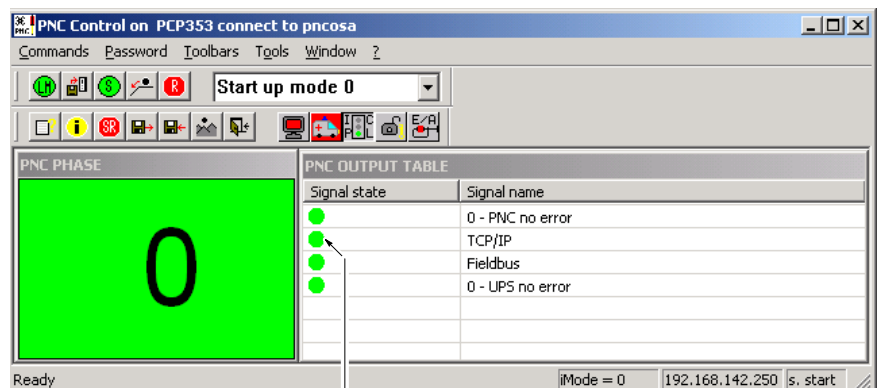
 Starting

★   Click on or select the menu sequence *Commands* ▶ *Start PNC*.

Numbers –3 to 9 are displayed one by one on red background in the phase display during the loading phase.

Once the start-up phase has been successfully completed, "0" will be shown on a green background in the phase display. The status line shows **s. start**.

Full circle (flashing):
Transmission via TCP/IP active

PNC-P running

PNC Control

Control displays during the operating system start

Se-quence	Phase display PNC Control	Status line PNC Control	LED on PNC adapter	
PNC-P start	–3 .. 9 (red background)	s. start	Ready: Error: TCP/IP:	OFF OFF green when accessed
PNC-P running	0 (green background if Ready is available. Otherwise red background)	s.start	Ready: Error: TCP/IP:	permanent green light OFF green when accessed

☞ **For more information concerning the phase sequences, please re-fer to the online help of PNC Control.**

When the PNC-P operating system has been started, you may call up your applications (refer to section 3.6).

PNC Control

4.4.5   RESET commands

CAUTION
When RESET commands are given, the PNC-P is stopped, and the Ready signal becomes low.
You should finish all applications concerned (e.g. NC program) be-fore triggering a reset!

The PNC Control offers two different RESET commands.

Reset PNC

This command corresponds to a hardware RESET without saving data. All applications in connection with the PNC-P are stopped without a pre-warning, the complete PNC-P memory is cleared.

★   Click on or select the menu sequence *Commands* ▶ *Reset PNC*.

The monitor and operating system have to be re-loaded before the unit can be operated again:

1. Switch PNC-P into monitor mode .
2. Initiate download of the operating system software into the PNC .
3. Start the PNC-P operating system .
4. If necessary, restart previously active application.

Soft Reset

This command will stop the PNC-P and all applications linked to it with-out any further warnings, and the system will be re-started afterwards according to the start-up mode setting.
All data remains stored in the PNC-P.

★   Click on or select the menu sequence *Commands* ▶ *Soft Reset*.

PNC Control

4.4.6   Shutdown command

☞   **CAUTION**
**When initiating "Shutdown PNC", the PNC-P is stopped, and the
Ready signal becomes low.**
**You should finish all applications concerned (e.g. NC program) be-
fore triggering a reset!**

"Shutdown PNC" initiates a controlled shut-down of the PNC-P. All files
open in the PNC are closed and saved in backup files, and the entire
memory is deleted afterwards. The monitor and operating system have
to be re-loaded before the unit can be operated again.

The backup data will be saved in the PC-P installation directory of the PC
basic unit. For this purpose, a directory

   c:\pnc\<PNC_name> (e.g. c:\pnc\pncosa)

is created to which the following backup files are saved (also refer to sec-
tion 5.1):
- Pncroot.pxf – filesystem of the PNC-P
- pncnldd.pxf – permanent CPL variables
- Pncpcld.pxf – permanent markers and data modules of the PLC

★   Click on [icon] or select the menu sequence *Commands* ▶ *Shutdown PNC*.

PNC Control

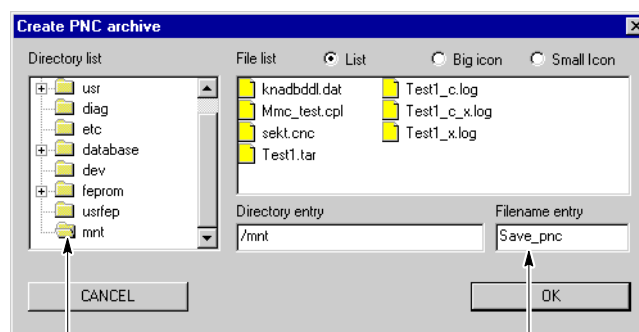## 4.4.7   Archives

 Archive create

☞ **In order to save data in an archive, the PNC-P filesystem must have access to an external mount directory because an archive can only be saved in a mount directory.**
The default directory name /mnt corresponds to the default path: c:\pnc\cncfiles on the hard disk drive of the PC basic unit.

★   Click on or
select the menu sequence *Commands* ▶ *Archive create*.

★   Highlight the data ranges to be saved in the archive:
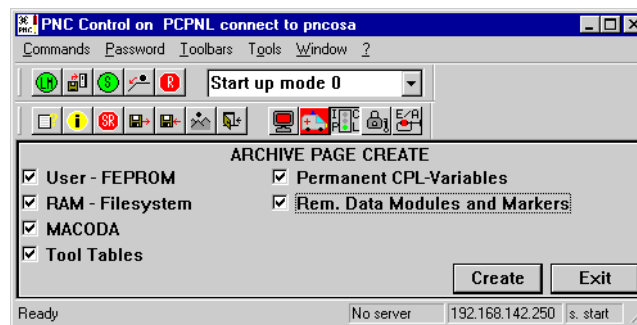
★   Confirm by hitting *Create*.

The name and storage location of the archive should be entered in the next window, the extension ".tar" will be automatically added.

"/mnt" corresponds to the default path   Name of archive
"c:\pnc\cncfiles" on the basic unit.

Confirm by hitting *OK*.
The storage of the data in the archive is started and indicated by yellow bars in the PNC SAVE ARCHIVE window area.
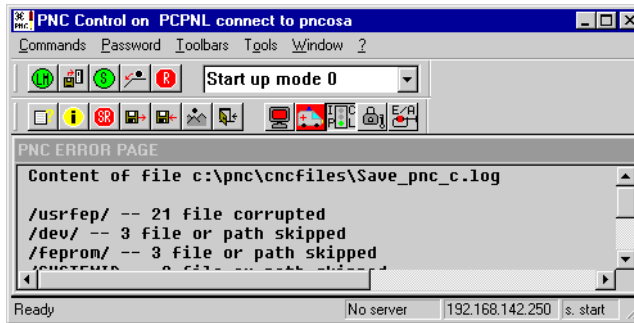
PNC Control

Archive log:

When the archive has been created, a log is created that contains the status and errors, if any, of the data transmitted, and displayed in the PNC Control window. The log file is saved to the same directory (c:\pnc\cncfiles) as the archive file and can be equally viewed in a text editor or the NC Editor.

Example:

Archive name: Save_pnc.tar
Log file name: Save_pnc_c.log

Saving the archive:

The archive created should be additionally saved on an external storage medium (floppy disk, writable CD-R) or in a network folder.
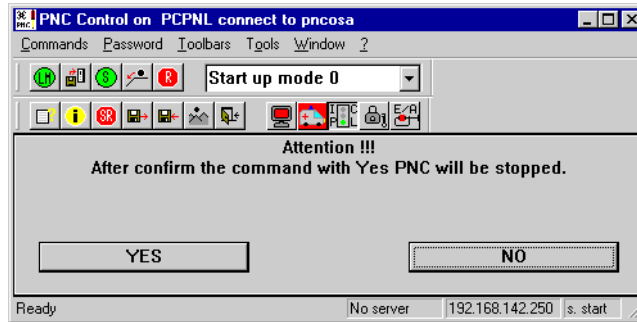
 Archive restore

☞ **In order to restore the user data, a shared mount directory has to be available in which the archive is stored.**

★ Click on or
select the menu sequence *Commands* ▶ *Archive restore*.
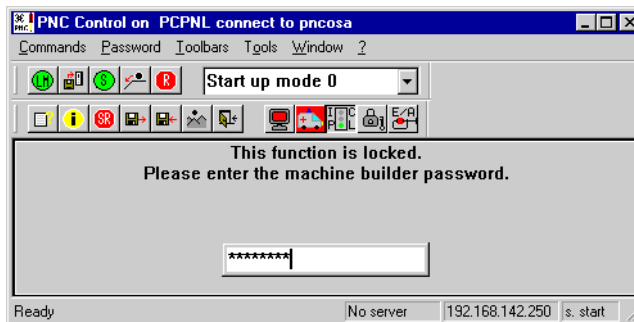
Restoring an archive is protected by a password for machine manufacturers (level 1). If necessary, contact your local service point.

PNC Control

The PNC-P has to be stopped, and the Ready signal switched off before calling up the archive function. Confirm by hitting *YES*.

★   In the next window, you should highlight the data ranges to be restored from the archive (initially none are highlighted):
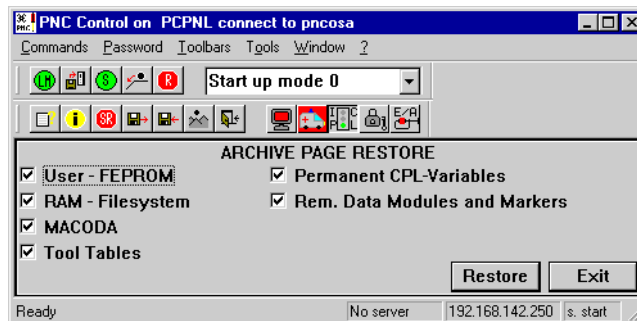
Confirm your choice by hitting *Restore*.

★   Select the folder (including network folders) as well as the archive file to be restored (filename extension: .tar).
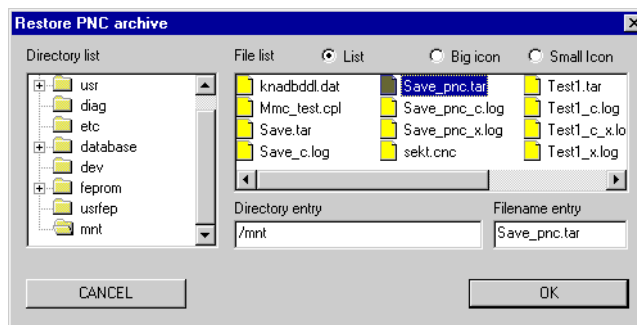
Hit *OK* to start restoring the archive. The process is visualized by yellow bars in the PNC READ ARCHIVE window area.

CAUTION
Unless write-protected, existing files in the RAM or in the user FEPROM of the PNC-P with the same names will be overwritten without a safety query when restoring data!

PNC Control

A successfully restored archive is confirmed by a message. Errors will
be saved in the log file "[Archive_name]_x.pro". This file can be viewed
in a text editor immediately after the data has been restored.

When the archive has been successfully restored, the PNC-P will be
switched back to Ready state. Check the restored data ranges.

☞ **A soft RESET of the PNC-P may be necessary in order to activate
the data, e.g. MACODA, CPL variables.**

PNC Control

4.4.8   Mount directories

The filesystem used by the PNC-P is available in the RAM of the PNC-P adapter. Nevertheless, the PNC-P can also access directories located outside the card, e.g., on the hard disk of the PC basic unit or in the network. These mount directories serve for backup and general data protection purposes. The NC user interface can access up to 10 mount directories directly.

Possible mount directories in the PC basic unit or a network computer must have been created and shared for mounting.

Default setting

The following mount directories are always available and cannot be deleted from the MOUNT LIST table.

- Mount item "User FEPROM":
  the name of the user FEPROM directory is /**usrfep** which is available in the path **c:\pnc\pncosa\usrfep** in the PC basic unit as a factory default.

- Mount item "Mount":
  the default name of the mount directory is /**mnt** which is available in the path **c:\pnc\cncfiles** in the PC basic unit as a factory default.

Directories in the PC basic unit

Any directories of the PC basic unit that have been shared for mounting can be displayed by clicking on the NFS icon in the task bar.
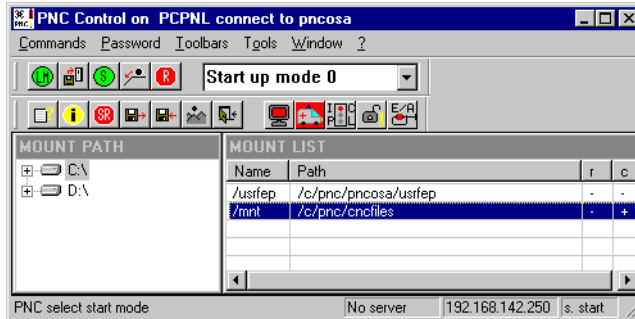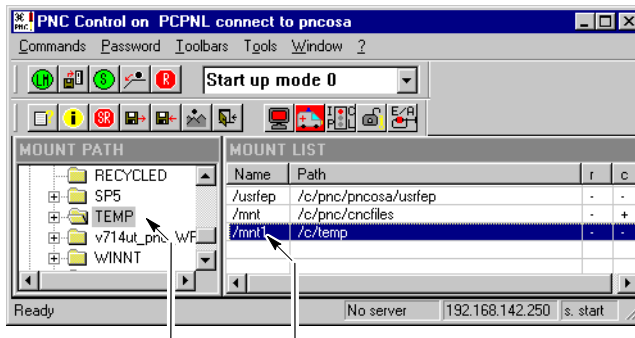
★   In the menu of the NFS icon select: ▶ *About*

PNC Control

![Mount icon]**Mount**
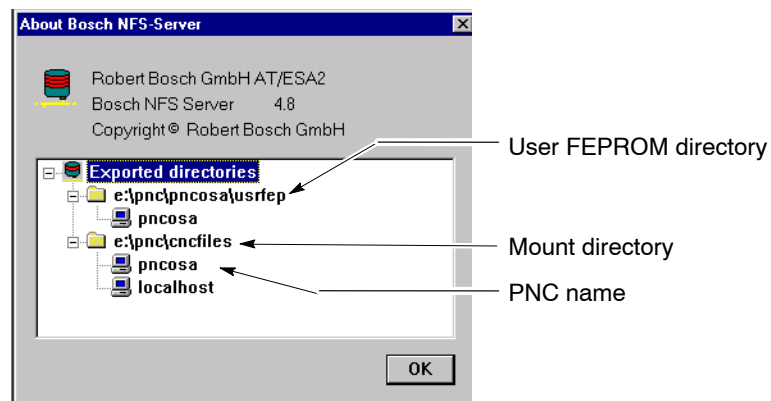
★ Click on ![icon] or select the menu sequence *Commands* ▶ *Mount*.

The "MOUNT PATH" window contains the drives and directories of the PC basic unit.
The "MOUNT LIST" window displays all mount directories currently linked in tabular format.

e.g. selected folder: Mount name
c:\temp

★ To **link a mount directory** double-click with the right mouse button on a directory in the "MOUNT PATH" window. This directory will be automatically entered in the "MOUNT LIST" window under the next unoccupied Mount name (e.g. mnt1 ... mnt8).

☞ **The path will only be taken over if the mount table contains less than 10 entries.**
If an entry had already been highlighted in the MOUNT LIST before taking the directory over, this entry will be automatically overwritten by the new path. Only the first two entries cannot be overwritten.

★ To **unlink a mount directory** double-click with the right mouse button on a mount directory in the "MOUNT LIST" window. The directory will be removed from the "MOUNT LIST" table.

PNC Control

★　To **edit mount names and attributes** select an entry in the "MOUNT LIST" window. By left-clicking you will enter an Edit window in the position of the mount name.

When changing the mount name, you should make sure that it always begins with a slash "/", and that the name has not yet been assigned to another entry. Otherwise, suitable error messages will be output.

If necessary, attributes can be changed in the Edit window of the mount name. For this purpose, you should enter a space after the mount name, followed by one of the options listed below. <Enter> will set the attribute:

- "**r+**" :marks the path as read-only
  "**r–**" :marks the path as read/write path
  (factory setting)

- "**c+**" :activates the cache for this path
  "**c–**" :deactivates the cache for this path (factory setting).

Example:
/mnt1　r+　　　C:\temp
The mount name must be separated from the command by a space.
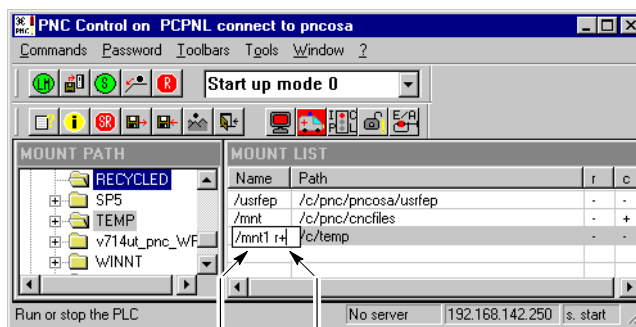
Name of the mount di-　　"read-only access" to the
rectory in the PNC:　　　mount directory in the
/**mnt1**　　　　　　　　PNC:　**r+**

You may also navigate within the mount window with the keys without using the mouse. The following table shows an overview of all navigation options:

<Key>	Mouse	Meaning
F2	Single click with left button in MOUNT LIST	Open edit window for mount name
F5		Update MOUNT PATH table
Esc		Exit Mount menu. Any changes made will **not** be accepted.
Enter		Exit Mount menu. Any changes made will be taken over.
Tabs		• Alternating between the two tables • Close edit window for mount name

PNC Control

<Key>	Mouse	Meaning
Ctrl s	Double-click with right mouse button in MOUNT PATH	Take over selected path from the MOUNT PATH table into the MOUNT LIST
Ctrl x	Double-click with right mouse button in MOUNT LIST	Delete the selected entry from the MOUNT LIST
Cursor: → , ← , ↑ , ↓		Cursor navigation within the MOUNT PATH and MOUNT LIST tables

★   Exit the mount menu by pressing <Enter> (accept changes).

The mount directory information is saved in the "export.us" file in the c:\pnc\bin directory as well as in the "pncboot79809.ini" or "pncboot84406.ini" files in the c:\pncosa directory of the PC basic unit.

A new mount directory will not become active before a **system restart**. After the start-up, the mount directory is available from the PNC user interface.

Network directories

In order to link a directory of a network computer as a mount directory, the NFS server must be installed and started on this computer as well, thus providing for the export of the desired directory.

★   Perform the steps described in the following example to link a mount directory in the network:
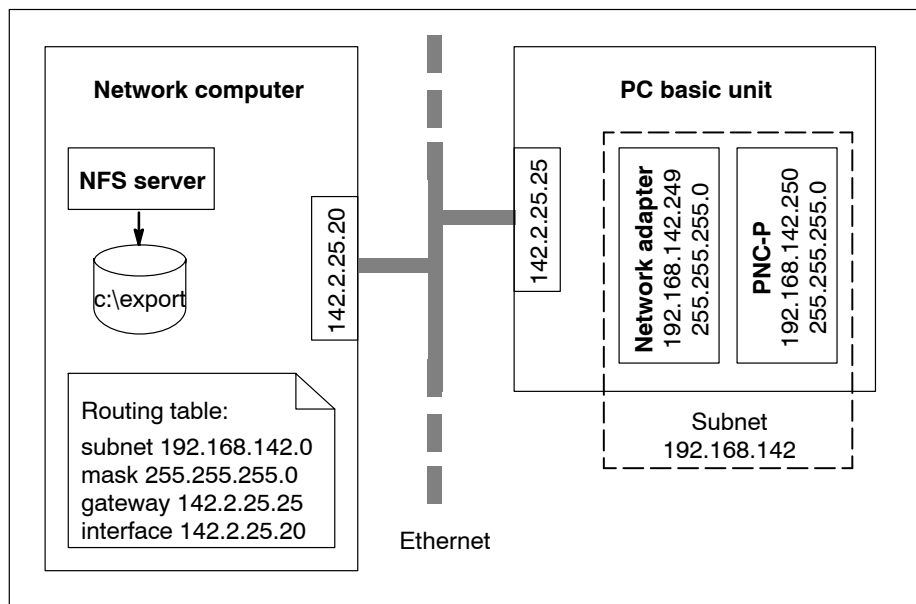
PNC Control

On the network computer:

- Install NFS server in c:\pnc\bin.
  the directory c:\export to be exported is located in file
  c:\pnc\bin\export.us (entry c:\export pncosa)
- Share the name of the PNC-P "pncosa",
  e.g., by entering "192.168.142.250 pncosa" in
  c:\winnt\system32\drivers\etc\hosts
- Enter route for subnet 192.168.142.0,
  e.g., by starting the MSDOS input prompt
  "route add –p 192.168.142.0 MASK 255.255.255.0 142.2.25.25

In the PC basic unit:

- Install PNC-P software (c:\pnc) and assign name "pncosa".
- for mounting, the file must be extended to
  c:\pnc\pncosa\pncboot79809.ini or c:\pnc\pncosa\pncboot84406.ini.

  Enter the desired additional mount information between the lines
           #STUPFILE
           #ESTUPFILE
  and the lines with the 'NFSMOUNT' keyword already available there
  (refer to highlighted line in the following example).

  Example:
  #BPAR
  #STUPFILE
  UFEPMOUNT   192.168.148.249:/c/typ3pcp/pncosa/usrfep   /usrfep
  rw
  NFSMOUNT 192.168.148.249:/c/typ3pcp/cncfiles /mnt rw c+
  NFSMOUNT 142.2.25.20:/c/export /mnt2 rw
  #ESTUPFILE
  #EBPAR

  Where:
  - "mnt2": Mount directory and serial number
  - "rw": Access privileges – read/write

☞ **In the PC basic unit"IP forwarding" must be activated.
For setting for Windows NT, refer to page 3–29, whereas Windows
2000 will automatically perform a registry entry during installation
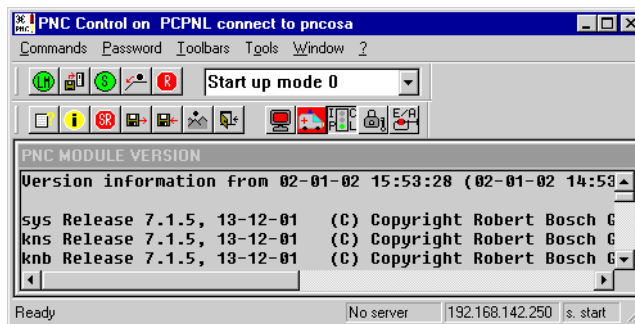of the PNC-P software.**

PNC Control

4.4.9   Software version

★   Click on or select the menu sequence *?* ▶ *Module Version*

The following service information will be displayed for the selected PNC-P:

- PNC-P Software Version, date
  (e.g.: sys Release 7.1.5, 13-12-01 © Copyright...)
- software modules included
  (KNS, NCS,...)
- Server and DLL versions

4.4.10   Displaying help

★   Click on or
Select the menu sequence: *?*   ▶ *Info about PNC Control..*

The online help (Internet Explorer 5.5 or higher) contains information concerning the menu items and the operation of the "PNC Control" software program:
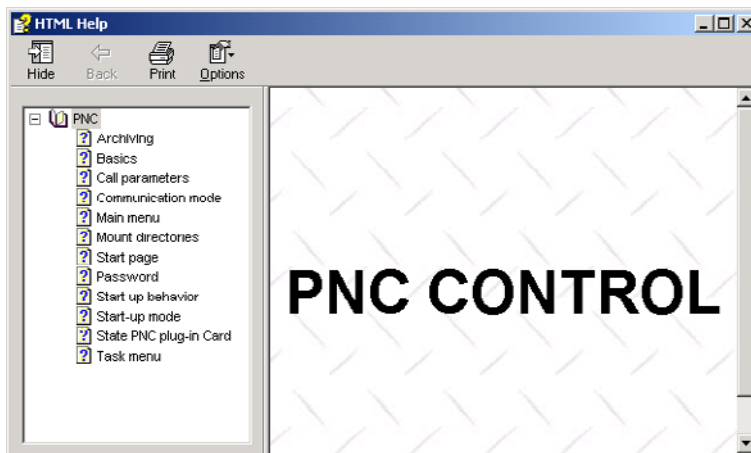
PNC Control

4.4.11   iPCL Run/Stop

This function stops and restarts the integrated PLC, refer to icon displayed.

☞ **When the PLC is stopped, the Ready signal of the PNC-P adapter becomes low.**

★   Click on or select the menu sequence *Commands* ▶ *PLC run/stop*

iPCL stopped (red)

iPCL running (green)

4.4.12   Disabling/enabling iPCL outputs

★   Click on or
select the menu sequence *Commands* ▶ *Output disable*.

This inhibits or releases the outputs of the integrated PLC, refer to icon displayed.

iPCL outputs are enabled

iPCL outputs are disabled

4.4.13   Delete fixed iPCL inputs

★   Click on or select the menu sequence *Commands* ▶ *Delete fixed Inputs*.

Deletes the fixed signals in the iPCL.

PNC Control

4.4.14   Password protection

In order to prevent unauthorized interventions in the PNC-P, the PNC
Control is protected by three different password levels:

- Level 0 (user):
  comprises functions any user may use.

- Level 1 (machine builder):
  comprises commands for controlling the PNC-P and the integrated
  PLC.

  The machine builder allocates his own password (refer to figure be-
  low).

- Level 2 (developer):
  comprises commands for stopping and starting the PNC-P deliber-
  ately (data loss possible).

☞ **Level 1 functions can also be activated via the Level 2 password.**

Once a password has been entered, the related functions may be ac-
cessed until 24.00 hrs on that same day.

To **Reset** the password, select menu item *Password* ▶ *Set level 0* and
change back to Level 0.

PNC Control

Changing a password

The passwords assigned by Rexroth may be redefined at any time.

★　Select the menu sequence *Password* ▶ *Change*

★　Select the desired password level.
The password level can be selected with the mouse or the keyboard
(tab, cursor). At the first call, Level 1 will be active in this case, and the
respective last level in all subsequent calls.

★　Enter old password
A password can only be changed by entering a valid old password. An
incorrect input will change the words above the input field from "Enter old
password" to "Wrong old password", and the text written in the input field
will be selected. A correct input will automatically set the cursor to the
second input window.

★　Enter new password
When the new password has been entered, this new password has to be
entered again to confirm **in that same window**. Above the input field, the
words will be changed from "Enter new password" to "Verify new pass-
word". If both inputs were identical, the focus will be set to *OK*. Pressing
<Enter> or clicking on *OK* will take over the new password, together with
the confirmation "Password was changed". The window is closed.

☞　**Entry of a new password can be cancelled at any time by pressing
<ESC> or clicking on** *Cancel*.

PNC Control

4.4.15 Remote Debugger

The Remote Debugger is an independent application for remote diagnosis of a PNC-P. It is only used if Rexroth is to perform a remote diagnosis.

★ Click on or select the menu sequence *Tools* ▶ *Remote debugger*.
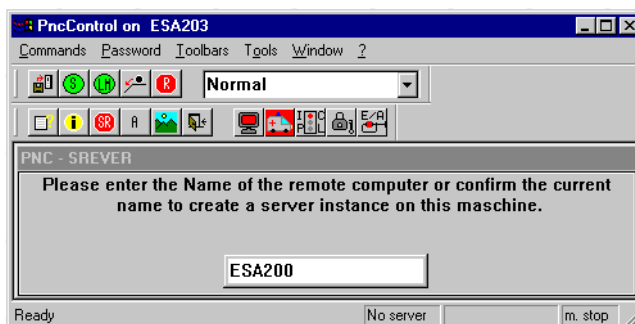
★ Enter the name of the desired controller.

The application will run in a separate window, the background color of the symbol will change from red to green ( ).

Data protection and error files

5 Data protection and error files

5.1 Backup files

When the PC basic unit is turned off by a faultless UPS or by entering the commands "Shutdown PNC" and "Save Filesystem", the current files will be saved in 3 backup files in the specific PNC-P subdirectory on the PC's hard disk, e.g.:

c:\pnc\<PNC_name> (e.g. c:\pnc\pncosa)

The following backup files will be saved:

- **pncroot.pxf**
  contains the complete RAM filesystem of the PNC-P
- **pncnldd.pxf**
  contains the permanent CPL variables
- **pncpcld.pxf**
  contains the remanent PLC data (permanent markers and data modules).

By selecting "Download PNC" or rebooting the PNC-P, the contents of the backup files are taken over into the controller. They are given the filename extension ".bak" and will be available as backup files in the event the controller is not properly booted.

Controller not properly booted

If some of the backup files are not available, or if one of these files is defective, booting is aborted, and PNC Control will output a suitable error message (error numbers 100 to 102 or 116 to 118).

☞ **All error messages will also be written to the "pncerrstate.log" file and the event display.**

Furthermore, a selection window containing status information for all backup files at the time of the loading process is opened.

Data protection and error files

A table shows the time stamp and status of the boot back-up files (*.pxf) and the back-up files (*.bak) generated when the controller was booted without errors for the last time.

⎯⎯: File does not exist

Σ :   Checksum error of the file, which cannot be used.
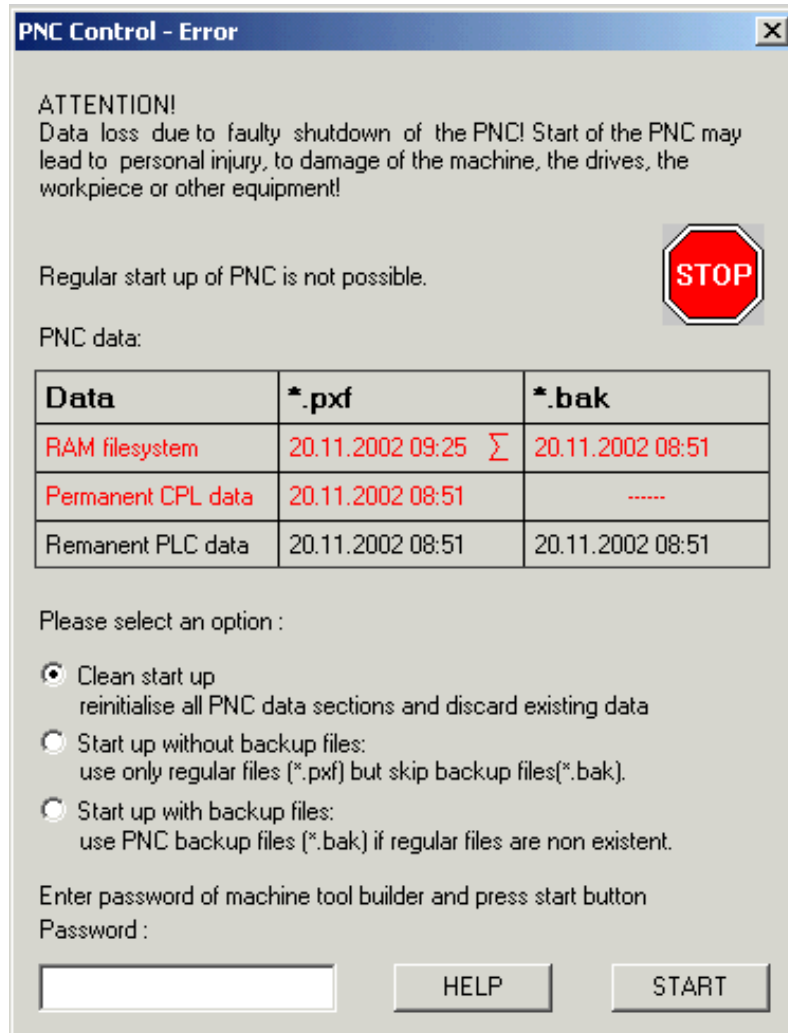
☞ **A table line containing a defective file is displayed in red letters.**

The aborted booting process for the controller can be resumed using one of the following three alternatives. The password for the "machine manufacturer" level is required for this purpose:

● **Clean start up:**
The controller is booted without using the existing backup files. The controller has to be reconfigured.

● **Start up without backup files:**
Only the faultless *.pxf files will be used for booting the controller. All *.bak files are ignored.

Data protection and error files

- **Start up with backup files:**
  The faultless *.pxf files will be used for booting the controller. In the event of an error, the corresponding *.bak file will be used instead.

DANGER
Possibility of damages to persons, machines, drives, or work-pieces!
After booting the controller you should first check, regardless of the booting alternative selected, the part program, compensation, ZS and tool tables, permanent CPL variables and remanent PLC data.

★ *START* will resume the booting process.

In this case, you should note that the controller behavior will change because other backup files were used.
This may result in personal injury or damages to the machine, the drives, or the workpiece.
A window containing a relevant warning, which opens after *START* , therefore offers the opportunity of aborting the booting process at this point again with *Cancel* and returning to the selection window.

☞ **In the course of a software update of the PNC-P, the "pncroot.pxf" file containing the entire RAM filesystem will receive the filename extension ".sav" and will thus be retained.**
For future backups, a new, empty file with the filename extension ".pxf" will be created simultaneously.

Data protection and error files

5.2   Error files

The PNC control uses further files to visualize information and error sta-
tuses, which are available in directory

c:\pnc\<PNC_name> (e.g. c:\pnc\pncosa)

within the installation directory of the PC basic unit.

- **pncncserror.log**
  This file contains the errors that were produced by PNC Control com-
  mands during NCS calls. These commands include:
  - Enabling or disabling PLC outputs
  - Starting or stopping the PLC
  - Deleting the fixed signals in the PLC
  - Querying the module version

- **pncvers.log**
  This file contains information concerning the software modules of the
  PNC-P as well as information on the hardware of the PNC-P adapter.
  The file is created when the module version is queried, and is visual-
  ized by the PNC Control.

- **pnccontrol.tlg**
  This file documents errors that occurred when loading and starting
  the monitor and when loading the PNC-P operating system. It only
  contains the errors that occurred last, because the file size is limited
  to 128 KB. All entries are supplemented by time stamps which indi-
  cate the time the errors occurred.

- **pncbootXXXXX.ini**
  This file contains information about the linked mount directories. It ex-
  ists in two versions:
  - **PncBoot79809.ini** for the PROFIBUS-DP hardware and
  - **PncBoot84406.ini** for the DeviceNet hardware.

- **pnccriterr.log**
  This file contains the following information about critical system er-
  rors:
  Type of error, error number, time stamp, software/hardware release
  version, and call chain (subsystem calling structure).
  The file should be sent to the Rexroth Service division for an analysis
  of the system errors.

- **pncerrstate.log**
  This file logs the error messages of the PNC and UPS which are dis-
  played in line 1 and 4 of the PNC Control.
  It only contains the errors that occurred last, because the file size is
  limited to 32 KB. All entries are supplemented by time stamps which
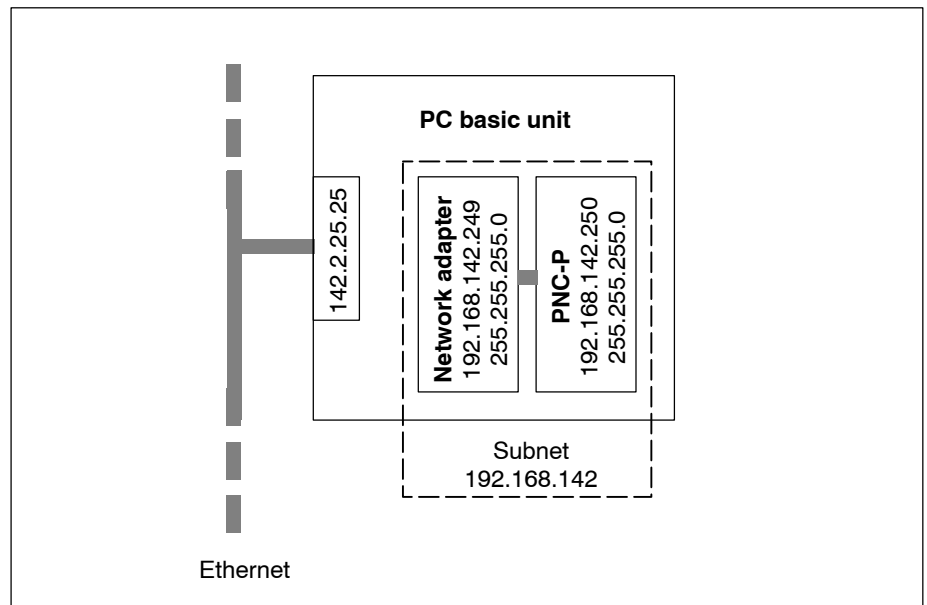 indicate the time the errors occurred.

IP addresses

6   IP addresses

Each PC basic unit is equipped with

- a PNC plug-in adapter with internal network link in a separate subnet
- an Ethernet adapter on basic unit

Example

6.1   PNC-P subnet

The entire data exchange between the PC basic unit and the PNC-P adapter is handled by the **TCP/IP** protocol.
The plug-in PNC-P adapter and the network adapter are treated as an internal subnet with fixed IP addresses.

During system configuration, the PNC-P adapter is assigned a permanent IP address by which this adapter is accessed by the PC basic unit. Furthermore, the symbolic name of the PNC-P adapter has to be defined.

★   Check and record the settings before making any **changes** to the current IP address settings.

☞   **All settings on the following pages correspond to the default values allocated during the set-up.**

IP addresses

Setting the IP address of the network adapter

In order to make the TCP/IP settings for the network adapter of the PNC-P adapter, please select the following Windows menu sequence:

Windows NT

Start ▶ *Settings* ▶ *Control panel* ▶ *Network* ▶ *Protocols* ▶ *TCP/IP protocol*

Click on *Properties..* and select the "Bosch PNC numerical controller" network adapter.

Windows 2000:

Start ▶ *Settings* ▶ *Network and Dialup Connections*.
Select *Local Area Connection 2* and click on *Properties*.

Select "Internet Protocol (TCP/IP)" and click on *Properties.*

Its IP address is: 192.168.142.249
The subnet mask has the address: 255.255.255.0

☞ **If these IP addresses are not identical with the default settings of the standard installation, please note down the current IP addresses in order to readjust your PNC to your local network after the next software update.**

Setting the IP address of the plug-in PNC-P adapter

The PNC-P adapter is known to the system as the "Bosch PNC numerical controller".

Windows NT:

★   Select the menu *Start* ▶ *Settings* ▶ *Control panel* ▶ *Network* ▶ *Network adapter*

★   Select the "Bosch PNC numerical controller" network adapter and click on *Properties...*

The screen shows the **symbolic name** of the PNC-P adapter installed during the "Setup" (Default: "pncosa").
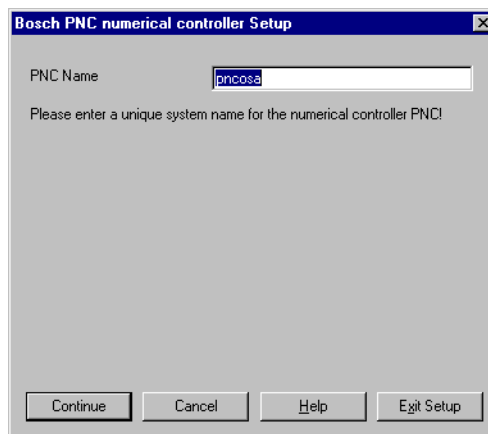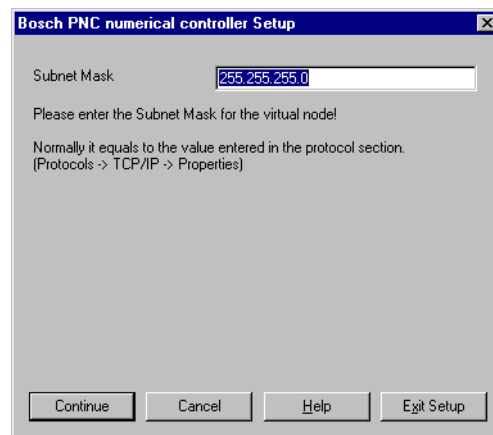
IP addresses

★ Confirm selection by hitting *Continue*.

The default IP address of the "Bosch PNC numerical controller" is:
192.168.142.250
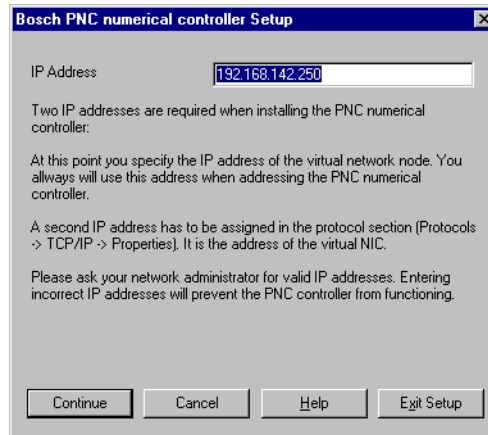
★ Confirm selection by hitting *Continue*.
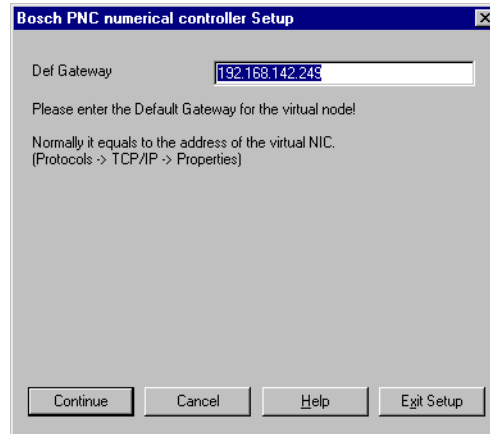
The default subnet has the address: 255.255.255.0

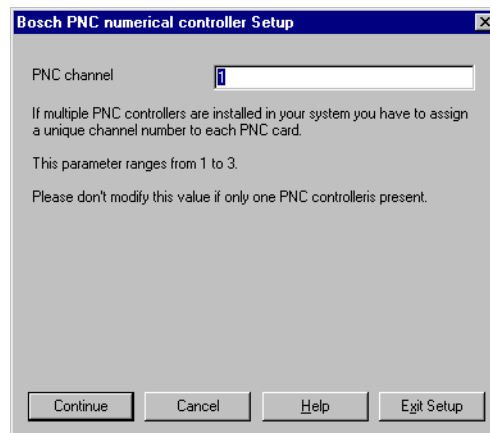

★ Confirm selection by hitting *Continue*.

IP addresses

The default gateway is identical to the IP address of the network adapter: 192.168.142.249

☞ **The IP address of the network adapter must be available in the subnet. Example: "192.168.142"**

★   Confirm selection by hitting *Continue*.

Channel 1 is always assigned to the PNC-P.

★   Confirm selection by hitting *Continue*.
This takes you back to the "Network" window. Press *Close* to accept changes.

IP addresses

Windows 2000:

★   Select *Start* ▶ *Settings* ▶ *Network and Dialup Connections*.
    Select *Local Area Connection 2* and click on *Properties*.
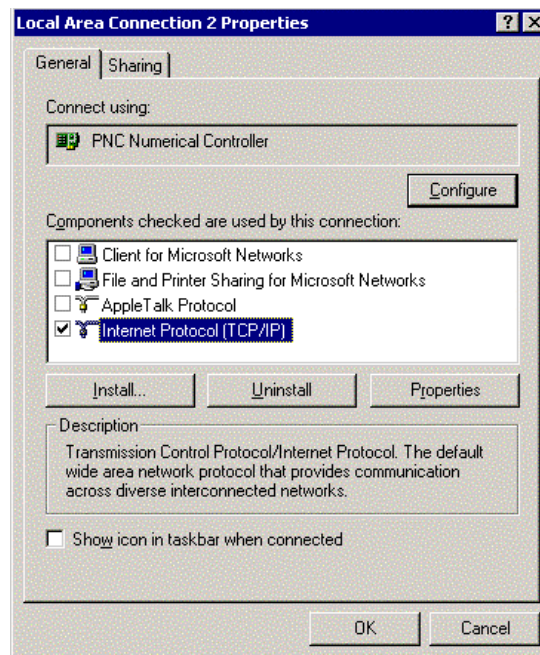
★   Click on *Configure* ▶ *Advanced* below the "PNC Numerical Con-
    troller" field.

In the next window, the following properties of the PNC Numerical
Controller are selected, and the settings are made.

●   **PNC Default Gateway:**
    This is the address of the network adapter:
    Default 192.168.142.249.
    It must always be located in the following subnet.

●   **PNC IP Address:**
    The default IP address of the "Bosch PNC numerical controller" is:
    192.168.142.250

●   **PNC Name:**
    Symbolic name of the PNC-P adapter installed during the "Setup" (De-
    fault: "pncosa").

●   **PNC Subnet Mask:**
    The default subnet has the address: 255.255.255.0

☞   **Channel 1 is always assigned to the PNC-P in the PNC Channel op-
    tion.**

IP addresses
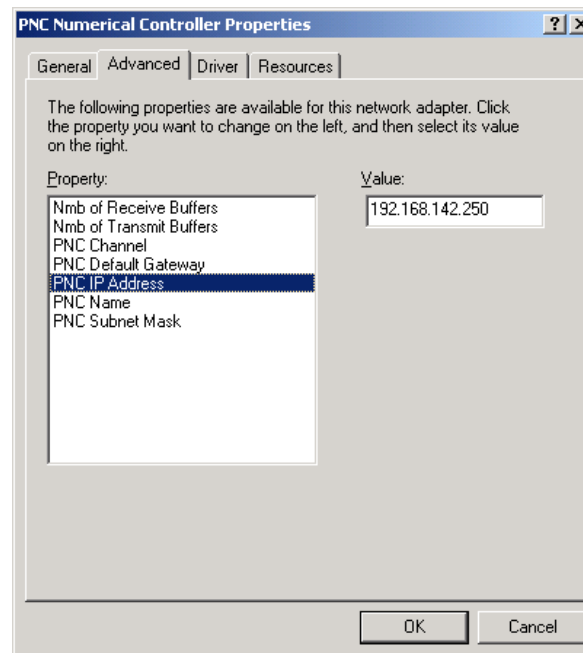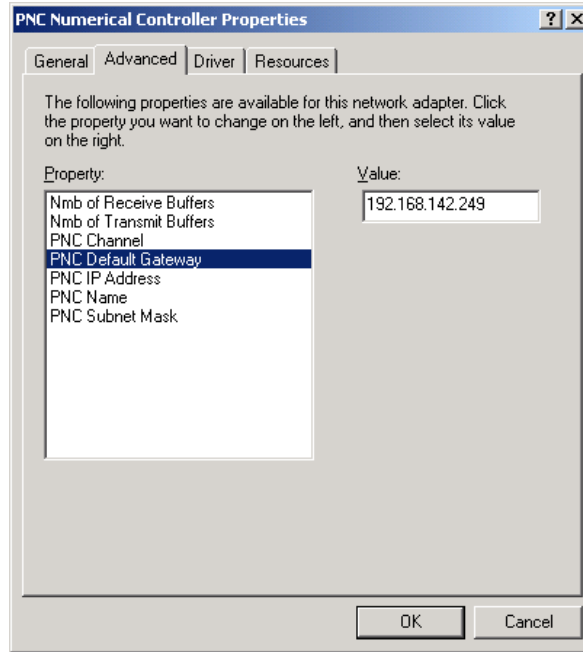
★   Confirm settings by hitting *OK*.

IP addresses

6.2   Ethernet adapter on PC basic unit

If the basic unit is additionally connected to a network, communication again takes place through the Ethernet link via TCP/IP. Again, a permanent IP address is needed for this link.

★ Please check and note the TCP/IP and network adapter settings on the existing hardware components if **changes** are to be made to the current IP addresses.

The IP addresses may have to be set if:

- another IP address is desired for the PC basic unit in the event of a PNC software update.
- several PC basic units are connected to a company network, and more basic PC units with PNC-P are to be added.
- the network address of the company network has changed.
- the entries were overwritten after a reinstallation of Windows on the PC basic unit.

In order to enter the TCP/IP settings for the PC basic unit, please select:

Windows NT

Start ▶ *Settings* ▶ *Control panel* ▶ *Network* ▶ *Protocols* ▶ *TCP/IP protocol*

Click on *Properties..* and select your network adapter, e.g. " Intel(R) GD82559ER".

Windows 2000:

Start ▶ *Settings* ▶ *Network and Dialup Connections*.
Select *Local Area Connection 2* and click on *Properties*.
Select "Internet Protocol (TCP/IP)" and click on *Properties.*

Its IP address is: 142.3.0.2 (**Example**)
The subnet has the address: 255.255.0.0 (**Example**)

IP addresses

Notes:

7   Accessing a network drive

For more information concerning the TCP/IP protocol or the network set-
tings, please contact your network administrator and/or refer to the
Microsoft operating system documentation.

☞ **We recommend reserving all network settings to your network ad-
ministrator.**

7.1   Sharing a network drive

Access privileges

In order to enable any computer on the network (client PC) to access a
CD–ROM drive, this drive has to be **shared**, i.e. the **permission to use**
this component has to be granted by the computer on which the drive is
installed (server PC).

In **Windows NT** the administrator may set up "groups" comprising users
with a "user profile" that allows them to share network drives. If no such
"group" has been defined, only the administrator can define which com-
puter may share its components with others.

★   Insert the CD containing the software program "SW PNC V7.x.x.x" into
the CD-ROM drive of the server PC.

★   Click on the icons: My computer ▶ CD-ROM ,

select the menu sequence *File* ▶ *Sharing...* ▶ *Shared as* and

enter the following network name: "CD".

The **shared** CD–ROM drive can be recognized by the icon .

Accessing a network drive

7.2   Connecting to a network drive

The computer that wants to access the CD-ROM drive (client PC) has to connect the shared CD-ROM drive on the server PC to its own filesystem (directory).

Searching the shared CD directory "CD" on the server PC:

★   Select: Network environment

search the "Entire network" option for the "Working group of the server PC". In this group, select "Network PC" and search for the "CD" folder.

★   Click on "CD" and select *File* ▶ *Link network drive....*
Now you should assign the "CD" a drive letter (e.g. "D:").

☞ **If configured accordingly, a password has to be entered to access the server PC before a network link can be established.**

★   Insert the CD–ROM into the drive.
Check in Windows Explorer whether the contents of the CD can be accessed.

Accessing a network drive

7.3   Access to the PNC-P adapter from an external PC (routing)

Applications such as WinSPS or PNC BOF can access a PC basic unit equipped with a PNC-P adapter from any network PC through the Ethernet network. In this case, a route has to be entered on the network PC.

Example
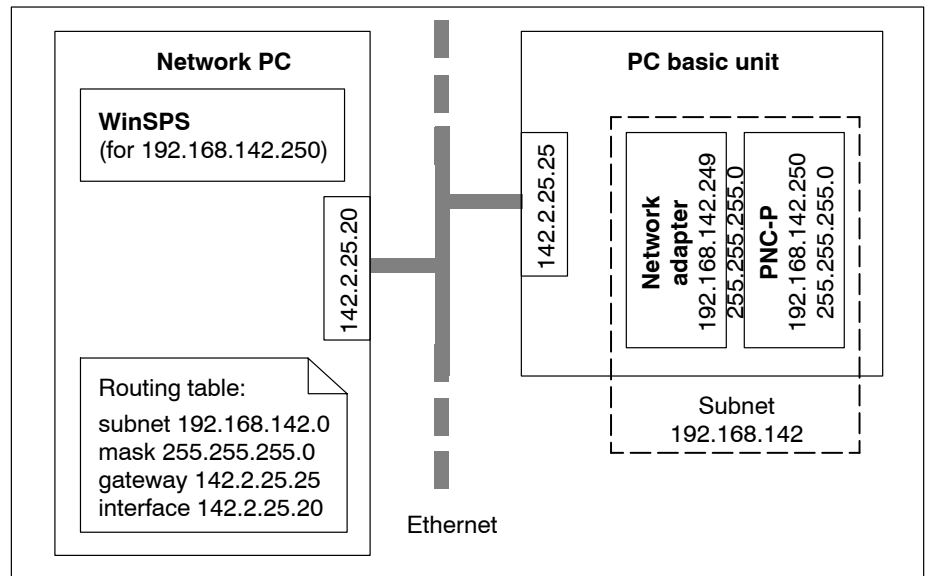
Condition

- The network PC and the PC basic unit must be located **in the same subnet**.
  Example (subnet 142.2.25.0):
     Network PC: IP address 142.2.25.20
     PC basic unit: IP address 142.2.25.25

- In the PC basic unit "IP forwarding" must be activated.

  Windows NT:
  Select *Start* ▶ *Settings* ▶ *Control panel* ▶ *Network* ▶ *TCP/ IP protocol* ▶ *Properties* ▶ *Routing*

  Windows 2000:
  Automatic entry in the registry during installation of the PNC-P software.

Enter route

A route has to be entered on the network PC for the PNC-P subnet 192.168.142.0, e.g., by starting the MSDOS input prompt:

   route add −p <Subnet Address> MASK <Subnet Mask> <IP Address of PC basic unit>

Example:
route add −p 192.168.142.0 MASK 255.255.255.0 142.2.25.25

Accessing a network drive

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A　Annex

A.1　Error messages

If errors occur during initialization of the PNC-P controller, the unit will not be operative. For more details of the errors, please refer to line 1 of the status display on PNC Control.

The texts displayed consist of one of the following references to the source of the error and an error name (refer to table).

Source of error:

- error windriver:　Windows driver fault
- error init:　　　　Initialization fault
- error card:　　　　Error on the PNC-P adapter

Error text	Meaning
0 - pnc no error	No error detected
1 - cannot open pnc for access	PNC-P adapter cannot be opened or accessed.
2 - pnc not opened for access	PNC-P adapter is not open for access.
3 - no pnc found	PNC-P adapter was not found.
4 - invalid vendor id	PNC-P adapter has the wrong manufacturer ID.
5 - invalid address space of the plx controller	Access to the PNC-P adapter with an incorrect PCI address range.
6 - pnc not found; too few pnc cards	PNC-P adapter with the specified number was not found.
7 - pnc monitor not loaded	Error when loading the PNC-P monitor.
8 - windriver is not running	The kernel driver "windriver" is not active.
9 - pnc bootloader not loaded	Error when loading the bootloader.
10 - pnc error by soft reset monitor	Soft RESET of the PNC-P is not possible, the PNC-P monitor is not active.
11 - pnc monitor not running	Faulty monitor operation.

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Error text	Meaning
12 - error while hard reset of the pnc	Error with hard RESET of PNC-P. Hard RESET is not possible.
13 - error in dualport ram test	RAM test was not completed without errors.
14 - invalid sysname or ipaddr	PNC Control tries to open a PNC-P adapter with an incorrect symbolic name or incorrect IP address.
15 - invalid windriver handle id	Error in PNC Control: inadmissible ID for communication with kernel driver "windriver".
16 - invalid windriver version	Incorrect version of the kernel driver "win-driver". The PNC DLL "cntldl" does not match the driver.
17 - invalid pnc state struc-ture	The data structure in the PNC memory for the PNC status has not been initialized.
18 - ethernet driver incompatible	NDIS driver of the PNC-P is not compatible with the PNC-P hardware and/or software.
19 - invalid pcl state	The status data of the PLC in the PNC-P memory has not been initialized.
20 - communication timeout	Communication between the PNC-P adapter and the basic PC unit is disturbed.
21 - invalid parameter	Incorrect parameter
22 - sysname is longer	Error in PNC Control: symbolic name of PNC-P is too long
23 - invalid shutdown state	Status after shut-down of PNC-P is not permitted.
24 - shutdown not possible	PNC-P cannot be shut-down.
25 - invalid dualport address	Inadmissible memory address when accessing the PNC memory.
26 - pnc cpu hang; bus cycle time-out	The PNC-P CPU is stopped because of a hardware access conflict.
27 - configuration data in plx eeprom invalid	Incorrect data in the EEPROM of the PNC-P.
28 - error by set reset mode	The start-up mode for booting the PNC-P after RESET cannot be set.
29 - shutdown not possible, application not running	The PNC cannot be shut down, because PNC Control is not running.
30 - cannot open file	File cannot be opened.
31 - cannot get file state	File status cannot be obtained.
32 - file not in coff format	File is not in COFF format.
33 - invalid header magic	Modified MAGIC in the file header.
34 - cannot clear bss section	BSS section cannot be deleted.

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Error text	Meaning
35 - cannot copy section	Section cannot be copied.
36 - cannot read from file	File cannot be read.
37 - cannot open pnc access	Access from PNC-P not possible.
38 - access to pnc dualport not allowed	Access to PNC memory is not permitted.
39 - card is already opened	PNC-P adapter is already open for access.
100 - start not possible, "pncroot.pxf" not found (file system)	Starting the PNC is not possible. "pncroot.pxf" was not found (file system).
101 - start not possible, "pncnldd.pxf" not found (cpl data)	Starting the PNC is not possible. "pncnldd.pxf" was not found (CPL data).
102 - start not possible, "pncpcld.pxf" not found (pcl data)	Starting the PNC is not possible. "pncpcld.pxf" was not found (iPCL data).
103 - save corrupt "pncroot.tmp" not found (file system)	Incomplete backup, "pncroot.tmp" was not found (file system)
104 - save corrupt "pncnldd.tmp" not found (cpl data)	Incomplete backup "pncnldd.tmp" was not found (CPL data)
105 - save corrupt "pncpcld.tmp" not found (pcl data)	Incomplete backup "pncpcld.tmp" was not found (iPCL data)
106 - error shutdown intern state "inactiv"	Shutdown fault, internal status: shutdown not active.
107 - error shutdown intern state "time-out"	Shutdown fault, internal status: Time-out
108 - error shutdown intern state "finished"	Shutdown fault, internal status: shutdown not properly terminated
109 - error shutdown intern state "control reset"	Shutdown fault, internal status: Control RESET has been set
110 - error shutdown intern state "not started"	Shutdown fault, internal status: shutdown not started.
111 - ups temperature	Excessively high ambient temperature signaled via UPS.
112 - ups battery	Battery pack of the UPS defective or not charged.
113 - ups temperature and battery	Ambient temperature too high and battery pack of the UPS defective or not charged.
114 - "pnccontrol.tlg" could not open	"pnccontrol.tlg" cannnot be opened.

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Error text	Meaning
115 - "pnccontrol.tlg" was again created	"pnccontrol.tlg" was generated again.
116 - "pncroot" checksum error	Checksum of the file "pncroot.pxf" or "pncroot.bak" is incorrect.
117 - "pncnldd" checksum error	Checksum of the file "pncnldd.pxf" or "pncnldd.bak" is incorrect.
118 - "pncpcld" checksum error	Checksum of the file "pncpcld.pxf" or "pncpcld.bak" is incorrect.

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Bosch Group