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Rexroth Bosch Group

Rexroth IndraMotion MTX Software Installation

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Installation Instructions

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Purpose of Documentation This documentation describes the installation and updating of the Rexroth IndraMotion MTX NC control and the network settings.

Record of Revision

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1 General Information About Setup

1.1 The Setup Program and this Documentation

What is installed? Who installs the program?

The setup program installs the Rexroth IndraMotion MTX user interface. Installing the user interface requires experience in working with PCs and with the operating system. Administrator privileges are required for installation.

☞ Setup may be executed only by an experienced user with knowledge of operating systems and with administrator privileges.

Setup program

The setup program decompresses and installs the user interface and the associated files from the CD-ROM onto your hard disk.
The user interface cannot be operated without this installation. Furthermore, it is possible to update and uninstall the software.

Documentation

This documentation informs you about how to install and set up the user interface on your hard disk, how to execute an update and how to remove the user interface.

☞ Read these installation instructions and, if necessary, additional documents **before** you install the software.

1.2 System Requirements

1.2.1 Control Modules IndraControl P40 and IndraControl P60

Brief description

The Rexroth IndraMotion MTX control system as scalable system consists currently of the three system variants:

- IndraMotion MTX compact, based on the IndraControl L40 control module
- IndraMotion MTX standard, based on the IndraControl P40 control module
- IndraMotion MTX performance, based on the IndraControl P60 control module

All the control modules provide both CNC and PLC functions. The highest configuration provides CNC performance allowing activation of up to 64 axes in 12 independent CNC processing channels. The standard equipment of control modules includes interfaces allowing the activation of I/Os via PROFIBUS-DP, of intelligent drives via the SERCOS interface and of peripheral assemblies via Ethernet. A High-Speed interface permits the module to be supplemented by additional field buses or interfaces.

The IndraControl L40 control module in terminal format has been designed on a switch cabinet for top hat rail assembly. The control modules IndraControl P40 and IndraControl P60 are performed as PCI slot modules and will be used in a free slot of an industrial PC.

Performance data

Designation	IndraControl L40	IndraControl P40	IndraControl P60
Number of axes	max. 8	max. 8	max. 64
thereof spindles	max. 2	max. 2	max. 8
Number of interpolated axes/ channel	max. 4	max. 4	max. 8
Number of NC channels	max. 2	max. 2	max. 12

General Information About Setup

Designation	IndraControl L40	IndraControl P40	IndraControl P60
SERCOS cycle time	min. 6 ms (for 8-axis configuration, 4-axis interpolation)	min. 6 ms (for 8-axis configuration, 4-axis interpolation)	min. 250 µs (for 8-axis configuration, 4-axis interpolation)
Block cycle time	min. 6 ms	min. 6 ms	min. 250 µs

Fig.1-1: Power data IndraControl L40, P40, P60

1.2.2 Industrial PCs

General

Plug-in cards IndraControl P40 and IndraControl P60 are inserted into a free PCI slot in Bosch Rexroth standard industrial PCs and high-end industrial PCs, as well as in third-party PCs.

Overview of industrial PCs

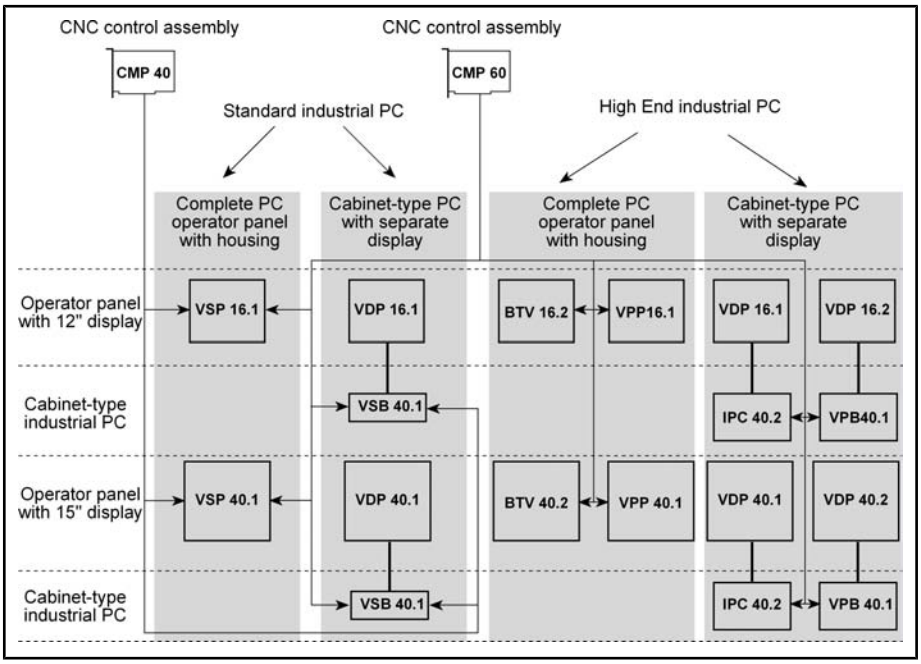

Fig.1-2: Overview of Industrial PCs

Documentation references

Documentation	Type	Material number
Rexroth IndraControl VSP 16.1/40.1	DOK-SUPPL*-VSP*16/40**-PRxx-EN-P	R911308264
Rexroth IndraControl VDP 16.1/40.1/60.1	DOK-SUPPL*-VDP16/40/60-PRxx-EN-P	R911307654
Rexroth IndraControl VPP 16.1/40.1/60.1	DOK-SUPPL*-VPP*XX.1***-PRxx-EN-P	R911311820
Rexroth VSB 40.1	DOK-SUPPL*-VSB*40.1***-PRxx-EN-P	R911310079
Rexroth IndraControl L40	DOK-CONTRL-IC*L40*****-PRxx-EN-P	R911308429
Rexroth VAM 11.1/41.1	DOK-SUPPL*-VAM*11/41**-PRxx-EN-P	R911308619
Rexroth VAM 10.1/40.1	DOK-SUPPL*-VAM*10/40**-PRxx-EN-P	R911306781
Rexroth VAK 10.1/40.1	DOK-SUPPL*-VAK*40.1***-PRxx-EN-P	R911311650
Rexroth VAK 11/41	DOK-SUPPL*-VAK*11/41**-PRxx-EN-P	R911310336

Documentation	Type	Material number
Rexroth RECO Inline, PROFIBUS-DP	DOK-CONTRL-R-IL*PBSSYS-AWxx-EN-P	R911289597
Rexroth RECO Inline, PROFIBUS-DP Terminal and Module Power Supply	DOK-CONTRL-R-IL*PB*-BK-FKxx-EN-P	R911289587
Rexroth RECO Inline, Digital Input/Output Terminals	DOK-CONTRL-R-IL*DIO***-FKxx-EN-P	R911289589
Rexroth Fieldline, PROFIBUS Devices	DOK-CONTRL-RF-FLS-PB**-PRxx-EN-P	R911298518

Fig. 1-3: Documentation references

1.3 Before You Start Installing the User Interface

If you have ordered a completely configured operator terminal with control modules, the user interface and the related firmware are already installed when the unit is delivered.

For user access, the following values are preset (depending on the operating system):

Windows XP access:

- User name: Rexroth
- Password: Rexroth

User interface:

- User name: Admin
- Password: Admin

The preinstalled operator terminal requires the following chapters only for updating the software. The user interface must be installed according to the following description if you use the operator terminal or a third-party PC with external control hardware or if you want to use the IndraControl P40/P60 control module on a third-party PC.

1.4 Using Virus Scanners

During the Rexroth IndraMotion MTX system installation, Java scripts are used for special tasks (embedded setups such as .NET Framework ServicePatch, IndraLogic, WinStudio). These are executed by MsiExex.exe. Some virus scanners, such as Norton Antivirus, see this as possible virus activity and issue a corresponding message.

If such a message appears, it can be ignored.

2 Carrying Out Setup

2.1 Administrator Privileges

2.1.1 General

☞ Administrator privileges are necessary for making operating system settings and for installing the user interface.

2.1.2 Access Data

Preinstalled operator panels supplied by the manufacturer have the following access data:

Windows XP:

- User name: Rexroth
- Password: Rexroth

2.1.3 Log on as Administrator

Log in as administrator:

Windows XP:

- User name: Administrator
- Password: - (none)

2.2 Initial Installation of Rexroth IndraWorks

2.2.1 CD-ROM

General

Rexroth IndraWorks software is supplied only on CD-ROM. For that reason, a CD-ROM drive or network connection must be available for setup.

Local CD-ROM Drive

Internal CD-ROM drive Certain Rexroth industrial PCs (e.g. those in a switch cabinet) include a CD-ROM drive.

External CD-ROM drive To execute Setup, a portable CD-ROM drive can be connected to the USB port of the industrial PC.

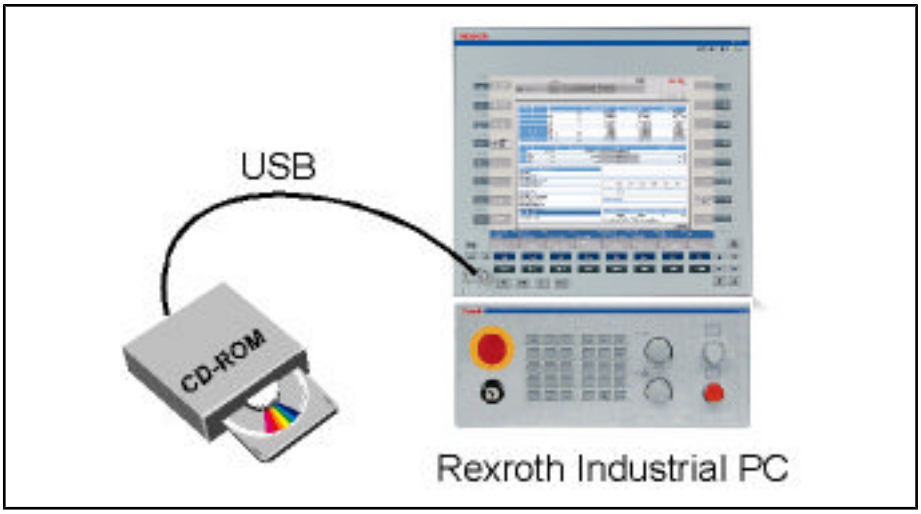

Fig.2-1: Locally connected CD-ROM drive

CD-ROM drive in a network

If the industrial PC is connected to a network, the CD-ROM drive of any PC incorporated in the network can be used for setup (see "Network settings" chapter).

1. Install the Microsoft network.
2. Enable the CD-ROM drive of the connected PC.

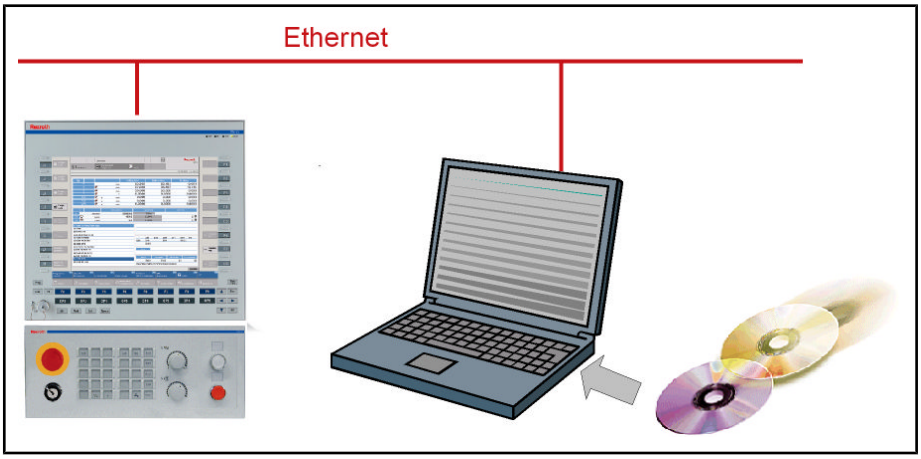

Fig.2-2: CD-ROM drive in a network

2.2.2 Installation from Hard Disk

If it is necessary to copy the data carrier (CD1, CD2) on the hard disk to install from there, the following must be observed:

1. Create a directory with a name on the hard disk: CD1
2. Create on this level another directory with a name: CD2

   IMPORTANT: The directory names must be named into CD1 and CD2!
3. Copy the content of the first CD into directory CD1
4. Copy the content of the second CD into directory CD2
5. Start SETUP.EXE from the directory CD1 from the hard disk

The installation runs automatically without demanding a CD change.

2.2.3 Installing Rexroth IndraWorks

In this description, we assume that you use CD-ROM drive "E" for setup.

1. Insert the CD into the CD-ROM drive.
2. Click **Execute** in the Start menu.
3. Type the letter for the drive together with ":\SETUP.EXE".

   When you install your system from a CD-ROM, enter, for instance, "E:\SETUP.EXE".

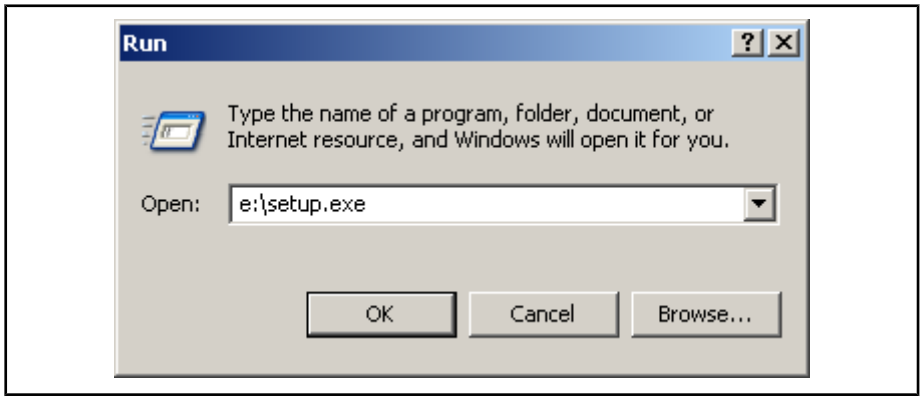

Fig.2-3: Windows XP "Run" dialog box

4. Then click **OK** or confirm with **<<Enter>>** .
5. Select the language for the setup program.

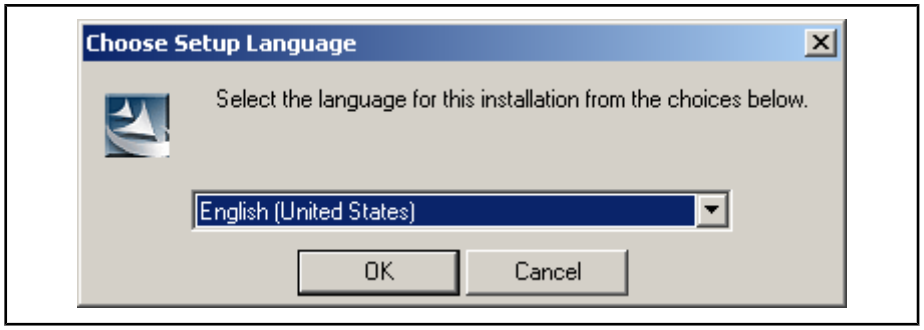

Fig.2-4: Language selection

   The setup program is loaded.

6. A message appears if release notes exist for the current version. If you select "Display Release Notes", the corresponding PDF document opens after you press **Next >**.

Carrying Out Setup

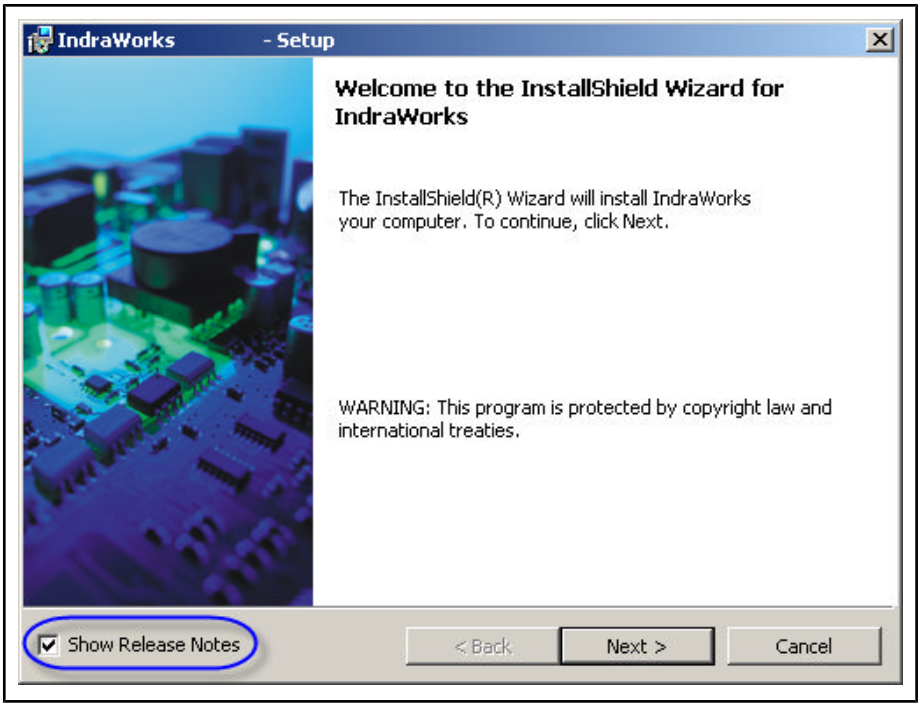

Fig.2-5: Note to release notes

7. Exit Acrobat Reader after reading the release notes and heed the remaining setup instructions.
8. Accept the conditions of the license agreement.

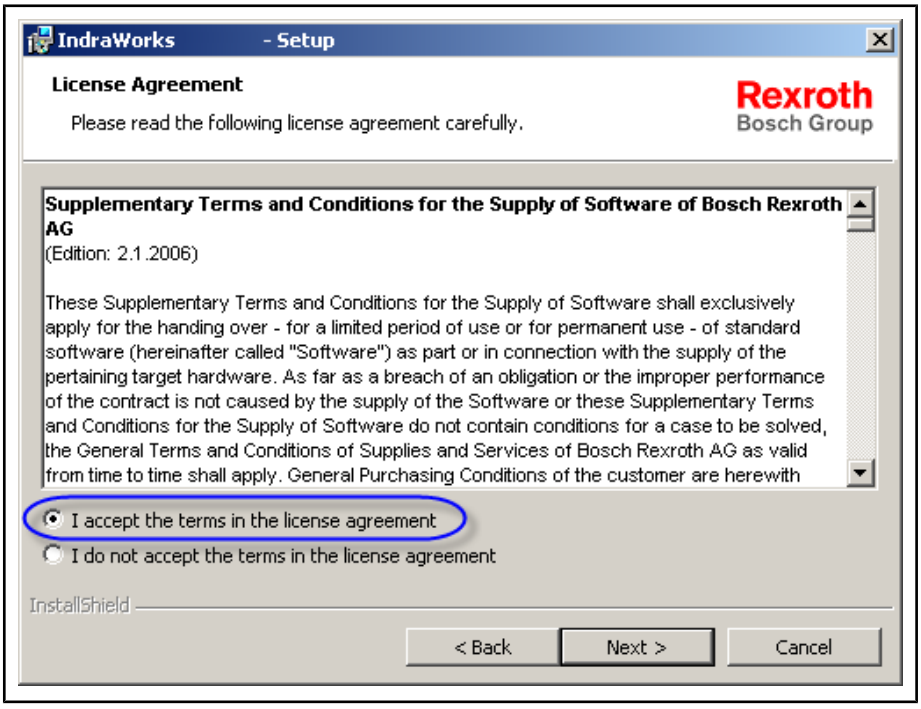

Fig.2-6: License agreement

9. Confirm by pressing **Next >**until the "Customer Information" dialog box is displayed.

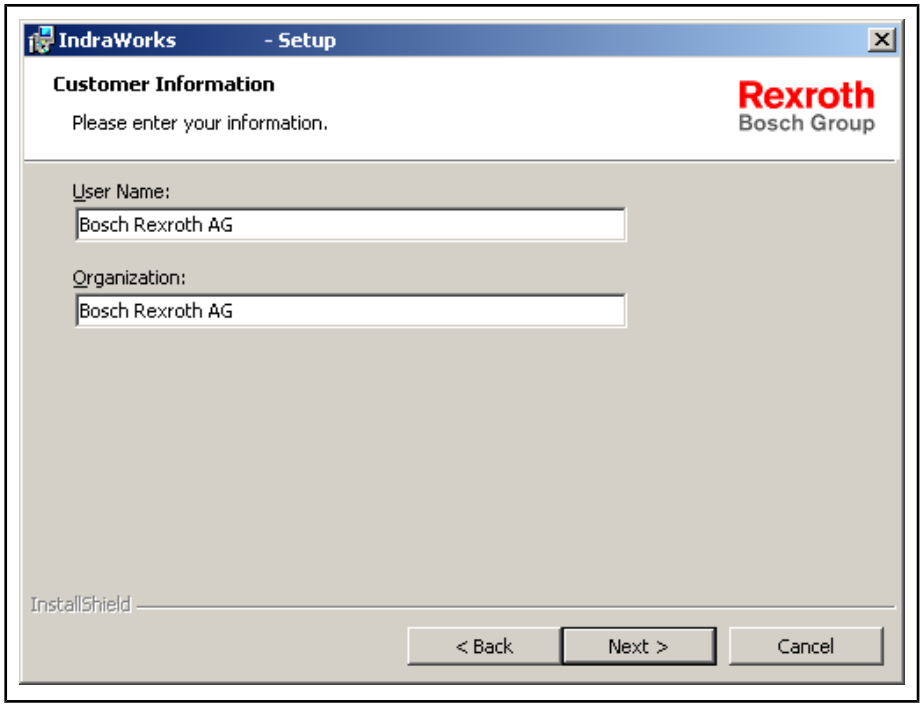

Fig.2-7: Customer information

10. Enter the name and company of the rightful user and press **Next>,**; this brings you to the selection of the desired setup directory (target folder).
11. In the dialog box, select the drive and the destination folder where the user interface is to be installed.

☞ The hard disk of a standard VPP has two partitions (C: NTFS file system, D: FAT32 file system). The interface must be installed on drive C.

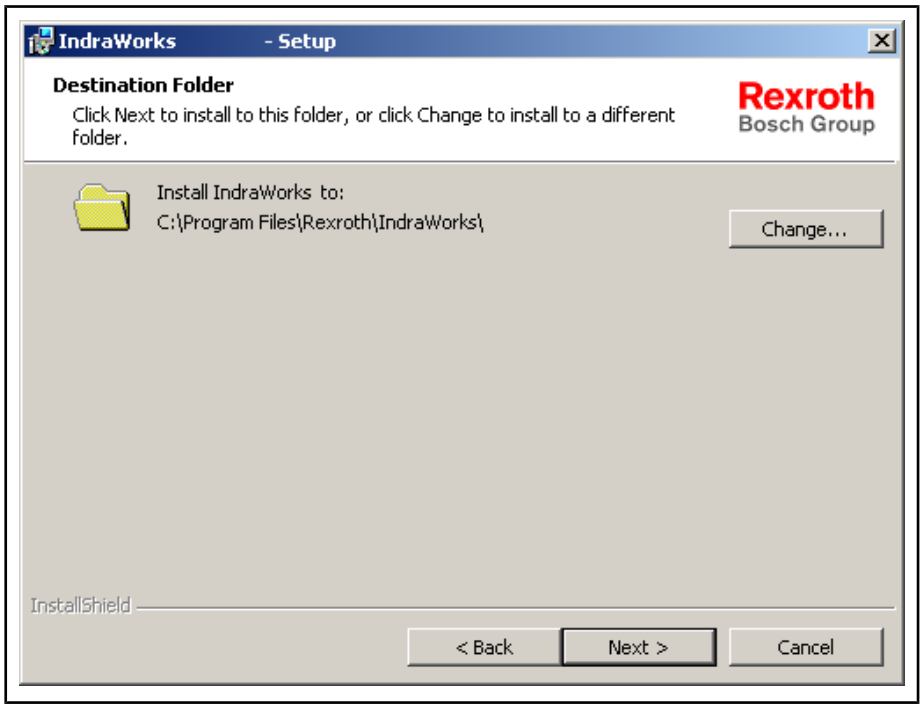

Fig.2-8: Selecting the type of installation

By pressing the **Next >** button, you reach the “Installation type” dialog.

12. Select “Extended”, if you would like to select single components.

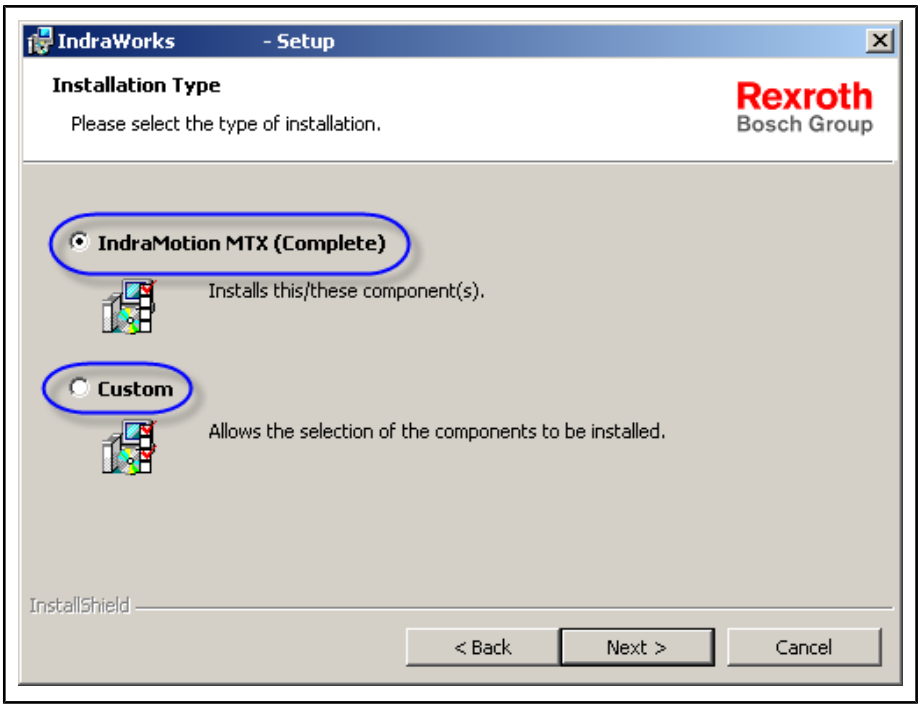

Fig.2-9: Select installation type

13. Please select the component which should be installed.

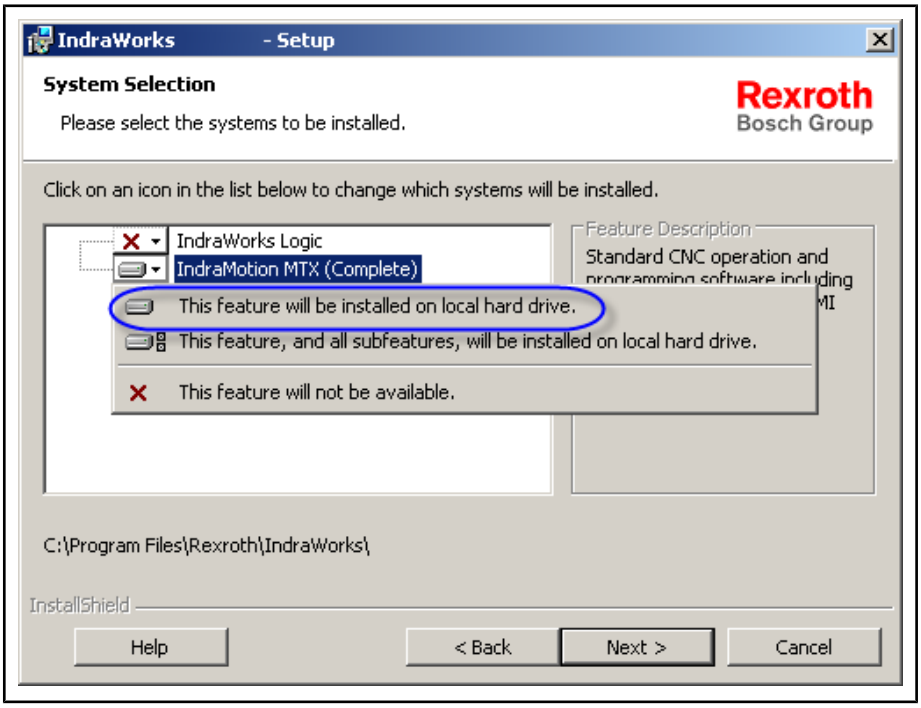

Fig.2-10:

Press **Next >**.

14. Entry dialog box for the MTX target name. “mtxctrl” is offered as default entry. The MTX target name can have max. 7 characters. Pressing **Next >** brings you to the IP input dialog box.

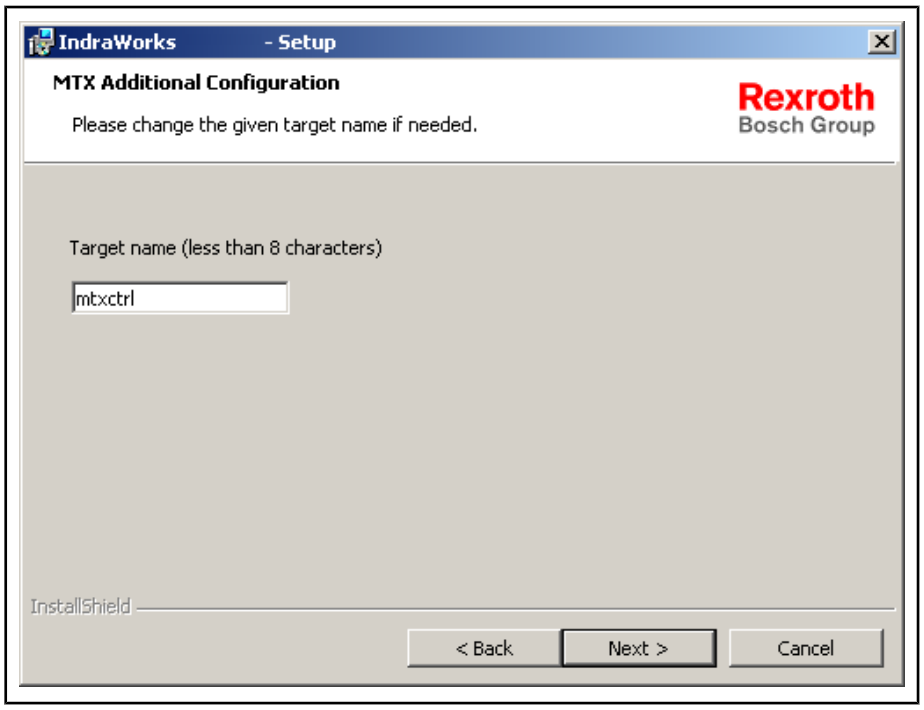

Fig.2-11: Entering the target name

15. Enter the IP address for the control card. Default: 192.168.142.250. Pressing **Next >** brings you to the Start dialog box for the actual installation procedure.

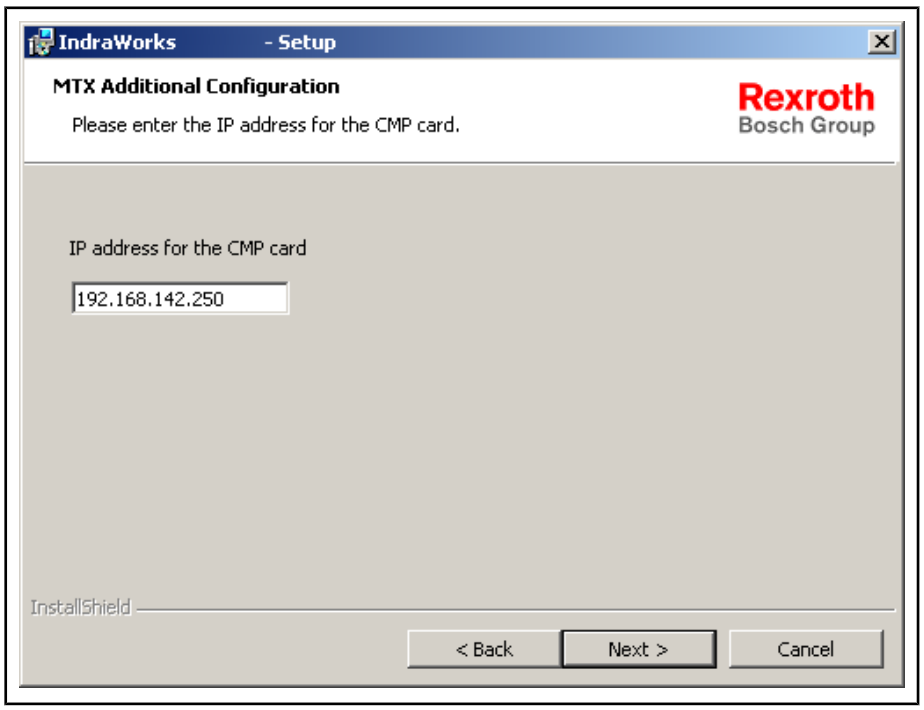

Fig.2-12: IP address of IndraControl P40/P60

16. Start the installation procedure by pressing **Install**

Carrying Out Setup

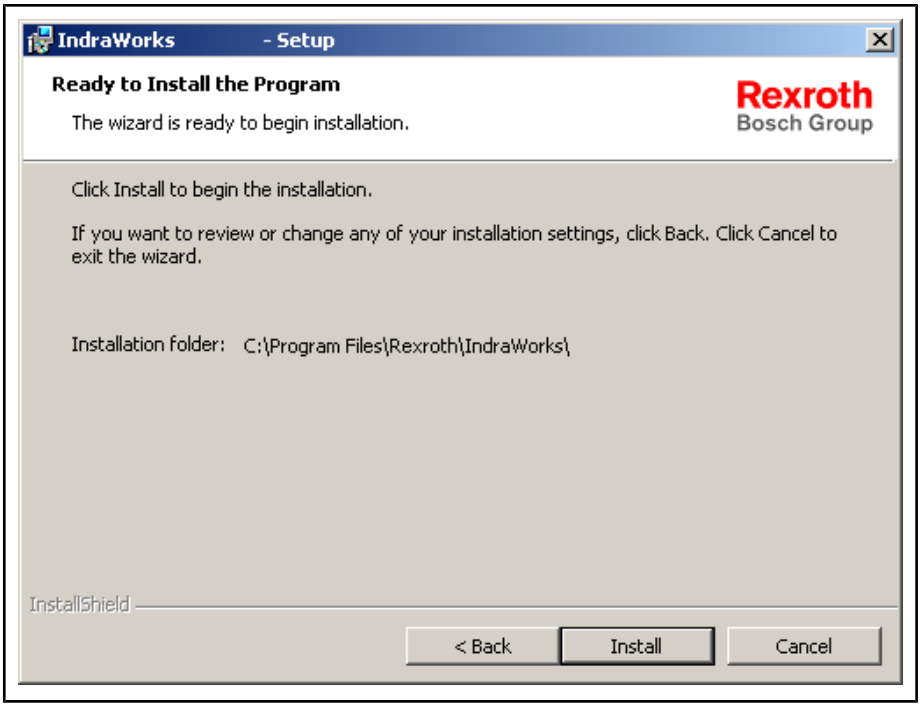

Fig.2-13: Starting the installation procedure

The installation procedure now starts. The progress of installation is displayed in a progress bar.

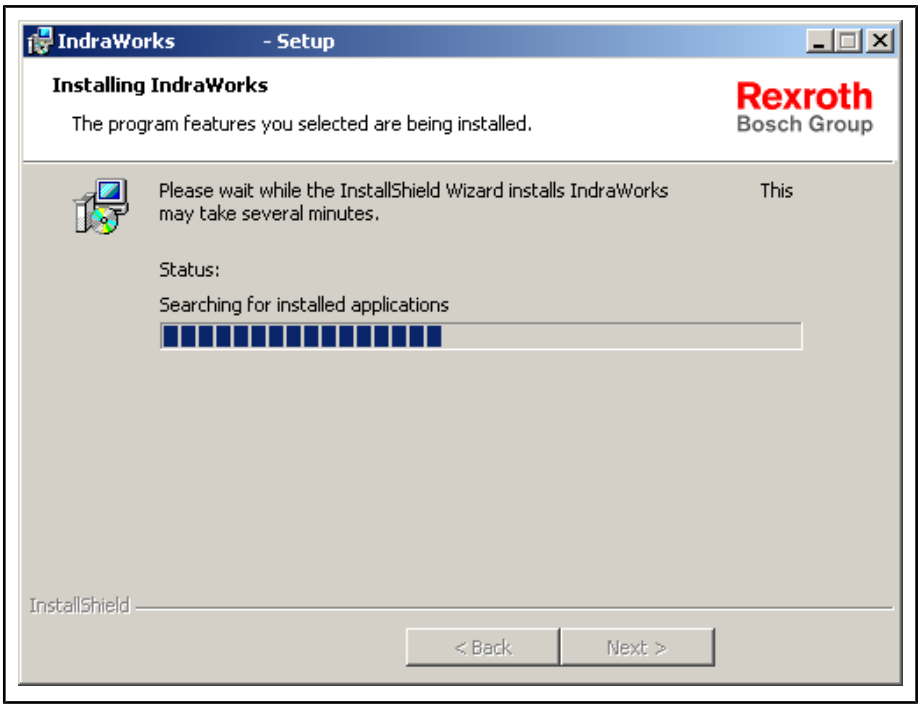

Fig.2-14: Progress of the installation procedure

17. During installation, you are asked to change the CD.
18. When requested, complete the setup by clicking **Finish**.

    After completion of the copying process, you will be prompted to restart Windows.

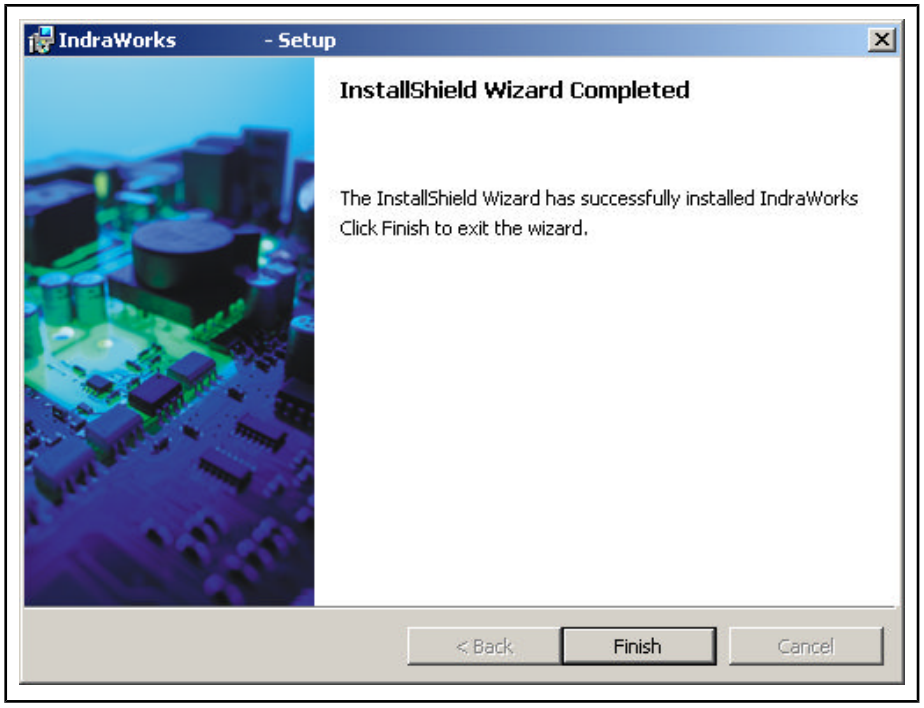

Fig.2-15: End of the installation procedure

☞ You must restart Windows and/or your computer before you can use the program.

After startup, the system files are updated and registrations, if required, are executed.

This completes the setup.

2.2.4 Installation of System Variant IndraControl L40 (Emulation)

Rexroth IndraMotion MTX is installed as emulation in connection with IndraControl L40. The installation is executed as described previously. The only difference is that the dialog boxes for entering the target name and the IP addresses do not appear.

2.3 Further Steps Before Commissioning an MTX Control

2.3.1 Firewall Settings

Windows firewall

☞ The service “Windows Firewall/ common utilization of internet connection” must not be exited! Otherwise the MTX emulation crashes without error message after booting the PC.

NFS Server and TeleBugger

Firewall settings must be made before commissioning. To permit the mounting of directories on third-party computers and to allow remote debugging if errors occur, exceptions must be set for these programs. These programs are “bnfsser.exe” and “TeleBug.exe” in directory ...\Rexroth\IndraWorks\mtx\bin.

The exceptions are set as follows:

Carrying Out Setup

1. In the Start menu, open **Start – Settings – Control Panels – Windows Firewall**.
2. Activate tab “Exceptions” and click “Program ...”.
3. Click “Browse” and switch to directory “...\Rexroth\IndraWorks\mtx \bin”.

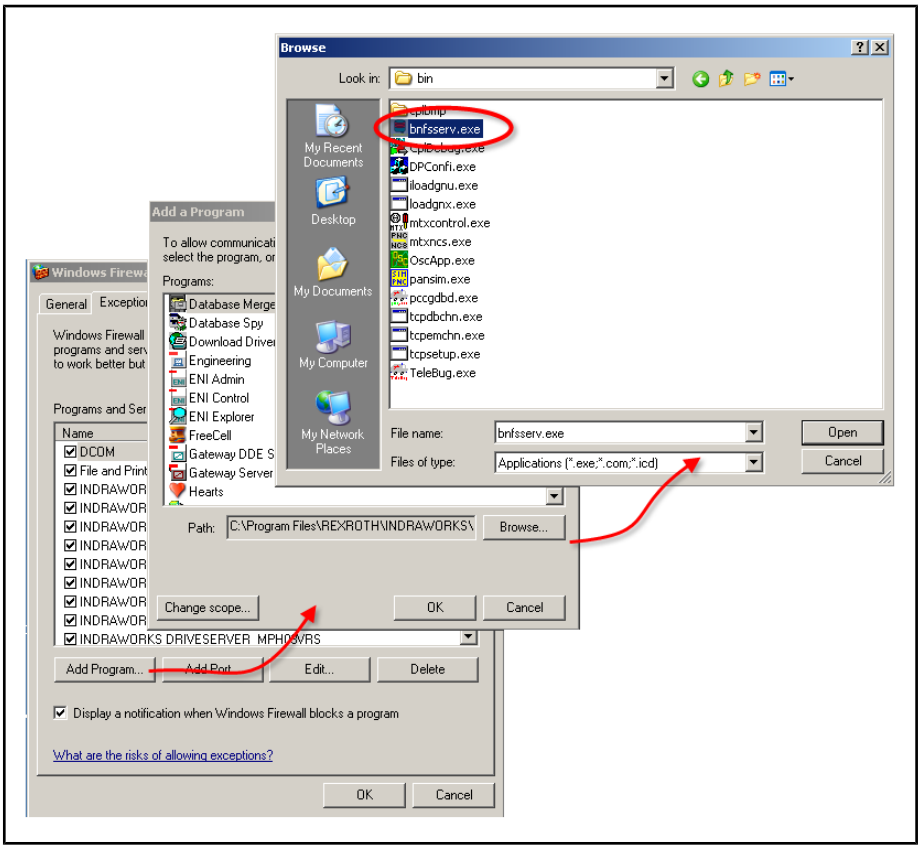

Fig.2-16: Setting “bnfsser.exe” as an exception

4. Select file “bnfsser.exe” and open it.
5. Confirm the dialog box by pressing “OK”.

   This transfers the file to the list of exceptions.
6. Use the same procedure for file “TeleBug.exe”.

   This removes these programs from the firewall.

IndraControl P40/IndraControl P60

Control card IndraControl P40/P60 must be taken from the firewall manually.

1. In the Start menu, open **Start – Settings – Control Panels – Windows Firewall**.
2. Select tab "Advanced".

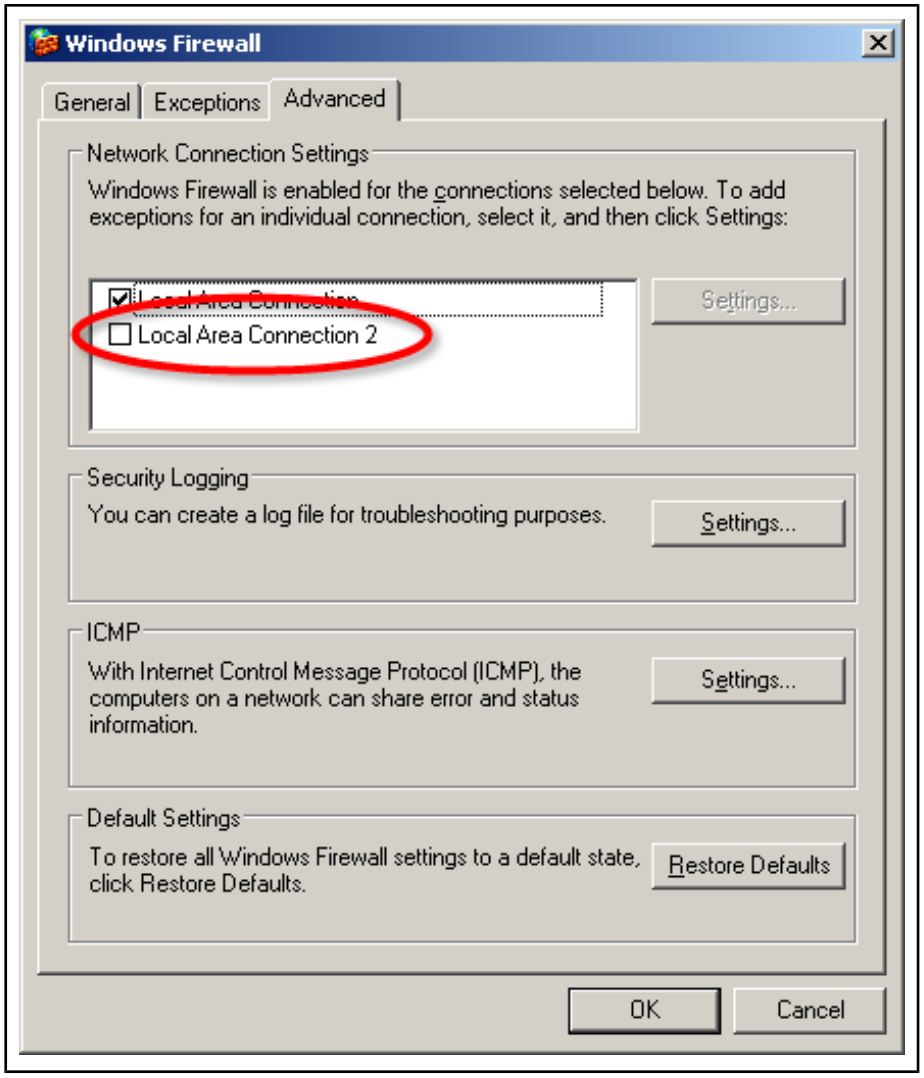

Fig.2-17: Advanced firewall settings

3. Deactivate entry “LAN connection 2” by removing the checkmark.
4. Accept the settings by pressing “OK”.

   Therewith the IndraControl P40/P69 is taken from the firewall.

2.3.2 Update Network Driver

The network driver for IndraControl P40/P60 establishes communication between the CPM60 control card and the IPC. The driver for IndraControl P40/P60 is installed as follows:

- Open the Windows **"Device manager" via "Start – Settings – Control Panel – System, tab "Hardware"**.

  The new hardware "Network adapter" which was detected by Windows should be marked with a yellow exclamation mark in the Device Manager.
- Click the right mouse button on the network adapter and select menu "Update driver...".

  The "Hardware update wizard" opens.
- Select the option "Install software from a list or certain source" in the hardware update wizard and press ”Continue”.

- Then select the option "Find a corresponding driver in this source" in the "Search and installation options" and enter path "LW\Program Files \Rexroth\IndraWorks\MTX\drivers" in "Find also in following sources". Exit the dialog box by pressing "Next".

  The driver is now installed; after installation, it is entered under Network adapters as "PCC-P Numerical Controller".

☞ The control absolutely must be restarted after installation of the network driver.

Afterwards, the IP address for the network adapter must be entered. See sections "Network Settings" and "IP Addresses".

☞ If the control was started for the first time after installation of control hardware IndraControl P40/P60, the assistant ”New hardware found” is opened automatically (same procedure as described above!).

After updating the IndraMotion MTX, the network driver should be updated.

2.3.3 Firmware Download

It is necessary to check if downloading firmware is necessary. The firmware version already installed must be compared with the version to load and, if necessary, the new firmware must be loaded. You can view the currently installed firmware version in the menu of the CMP 60 control under "**? - Firmware Version**".

Firmware Download is executed with the CMP 60 control. The control can be opened via "**Start – Program Files – Rexroth – CMP60 – CMP60 Control**".

- Firmware Download can be executed with the menu bar via command "**Commands - Download**". Alternatively, the icon for Firmware Download (topmost icon line, at the extreme left) can be used to call the Download Manager.
- Select the entry "**Monitor - Bootloader**" in the Firmware Download dialog box. The password is "Software". Then exit the dialog box by clicking “OK".
- Select the entry "**Firmware**" in the Firmware Download dialog box. Then exit the dialog box by clicking **YES**.
- After a successful download, execute a reset.

After the software reset has been triggered, the CMP control starts up and stops at a "red zero".

2.4 Uninstallationof Rexroth IndraWorks

Uninstallation using operating system

Rexroth IndraWorks is uninstalled using the operating system (via **Start Menu - Control Panel - Software**). Select "IndraWorks" as the program to be uninstalled. The Rexroth IndraWorks installation CDs are not required for this. After uninstallation, you are asked whether ALL the data within the Installation folder are to be moved to the trash.

CAUTION

Loss of user data!

⇒ Make sure that you save the user data before uninstalling the software if you want to keep them.

Fig.2-18: End of the uninstallation procedure

After completion of the uninstallation process, you will be prompted to restart Windows.

☞ In order to update the system files, restart Windows and/or your computer.

After startup, the system files are updated. This completes the uninstallation process.

3 Data Archival/Backup

3.1 Archiving the IndraWorks Project

☞ Archiving the IndraWorks project also includes the archiving of NC data.

- Start archiving in IndraWorks in **Project - Archiving**.
- Select the project to archive (normally the last active project) and press "Continue".
- Determine the name and path of the archive and press "Continue".
- Check the details and continue with "Finish" if all settings are correct.
- MTX archiving is now started.
- Acknowledge the welcome dialog box with "Continue".
- Select the portions to be archived and confirm with "Continue".

☞ If archive part "Remanent data of PLC" is selected, the PLC should be stopped via CMP60 control before starting archiving. "Software" is the password to stop the PLC by pressing the "PLC" button.

- Confirm the information by pressing "Finish".
- Now the MTX archive is created.
- Exit the dialog box "Create MTX archive - summary" with "Close".
- Now the project archive is created.
- After successful archiving, a dialog box with a summary is displayed.

☞ Note: The project path of the archived IndraWorks project, as well as the name and path of the archive, should be noted! This information is necessary for subsequent restoring.

3.2 Archiving of Data that are Not Project-Specific

☞ These data are PLC data as well as GSD files and PLC libraries if they are not saved project-specifically but target-specifically.

- Special GSD files go to folder "C:\Program Files\Rexroth\IndraWorks\ IndraLogic\Targets\<target name>\userconfig"
- Special PLC libraries go to folder "C:\Program Files\Rexroth\ IndraWorks \IndraLogic\Targets\<target name>\lib" or "C:\Program Files\ Rexroth \IndraWorks\IndraLogic\Targets\Config"

4 Executing a Software Update of IndraWorks

4.1 Executing an Update of IndraWorks

CAUTION

Loss of user data!

Save the user data **before** a software update.

In this description, we assume that you use CD-ROM drive "E" for installing the update.

Then click **OK** and confirm with <Enter>>.

1. Insert the CD into the CD-ROM drive.
2. Click **Execute** in the Start menu.
3. Type the letter for the drive together with ":\SETUP.EXE".

   When you install your system from a CD-ROM, enter, for instance, "E:\SETUP.EXE".

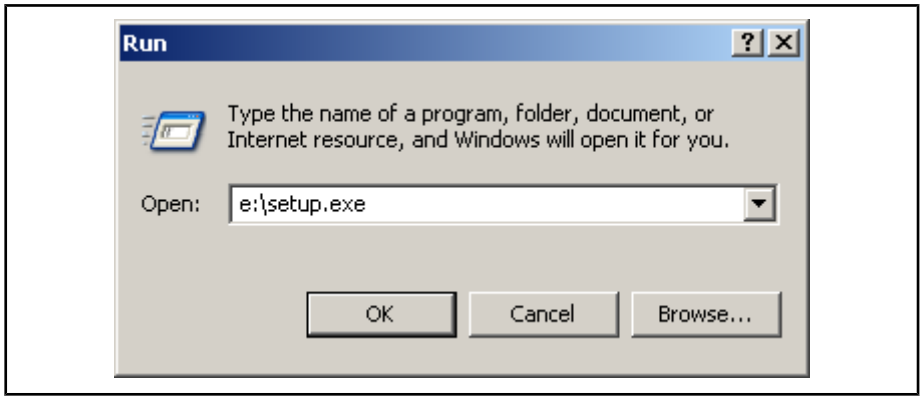

Fig.4-1: Windows XP "Run" dialog box

4. Then click **OK** and confirm with <Enter>> .
5. Select the language for the setup program.

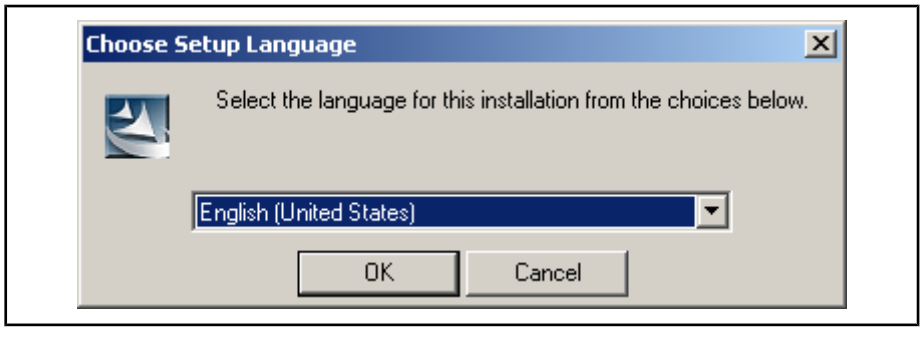

Fig.4-2: Language selection

The setup program is loaded.

6. There will be a note that a former version of IndraWorks was found. If you answer the query with **Yes**, the Info screen for executing the update appears.

Executing a Software Update of IndraWorks

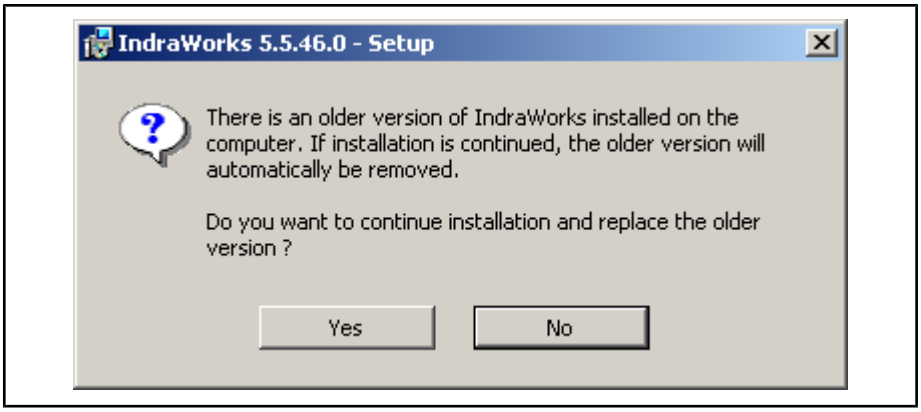

Fig.4-3: Message indicating IndraWorks update

7. Pressing **Next>** g brings you to the actual initial screen of the update procedure.

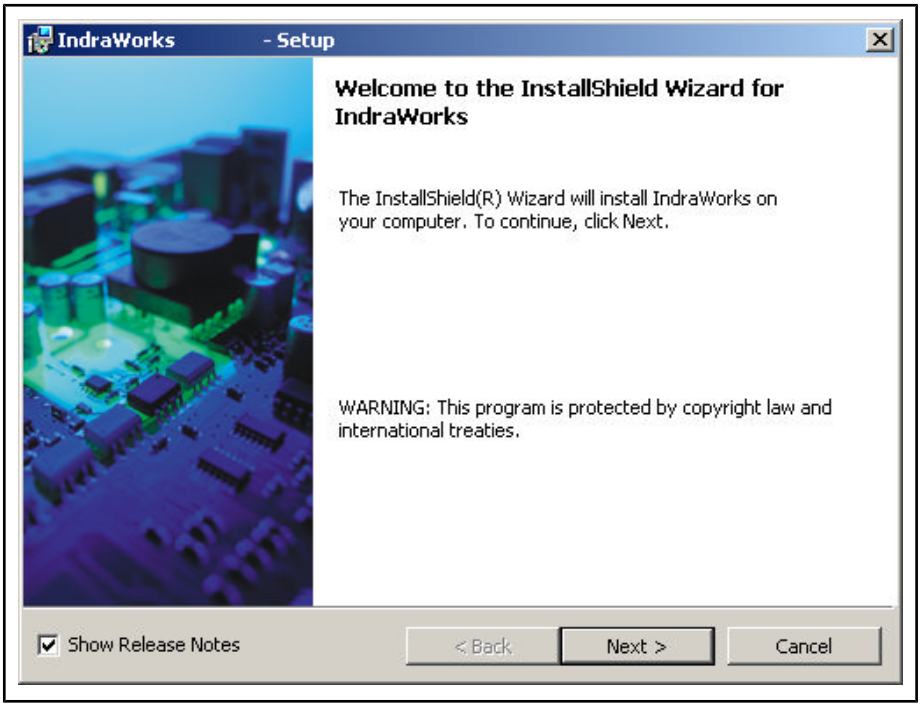

Fig.4-4: Info screen for updating IndraWorks

The further procedure is the same as for an initial installation. Please follow the instructions on the screen.

8. When requested, complete the setup by clicking **Finish**.

   After completion of the update process, you will be prompted to restart Windows.

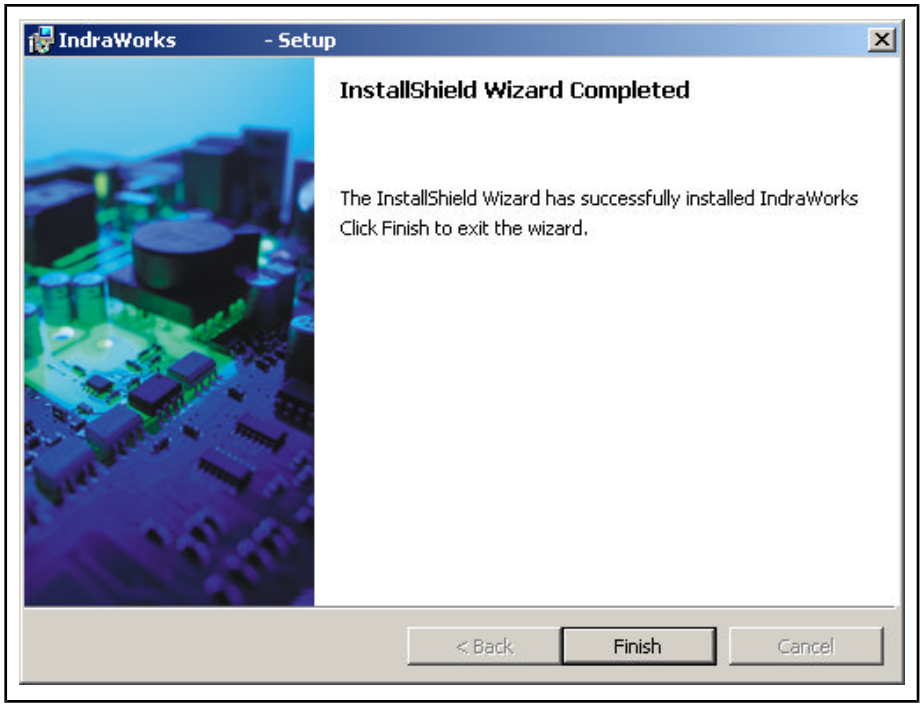

Fig.4-5: End of the update procedure

☞ You must restart Windows and/or your computer before you can use the program.

After startup, the system files are updated and registrations, if required, are executed.

This completes the setup.

5 Restoring Data

5.1 Restoring Data That Are Not Project-Specific

☞ These data are PLC data as well as GSD files and PLC libraries if they are not saved project-specifically but target-specifically.

- Copy these special GSD files from the backup folder to folder "C:\Program Files\Rexroth\IndraWorks\IndraLogic\Targets\<target name>\usercon-fig".
- Copy these special PLC libraries from the backup folder to folder "C:\Pro-gram Files\Rexroth\IndraWorks\IndraLogic\Targets\<target name>\lib".

5.2 Restoring the IndraWorks Project

- Start IndraWorks Engineering.
- Execute in IndraWorks in **Project - Restore**.
- Select the project to restore and press "Continue".
- Determine the destination directory and press "Continue".

☞ The destination directory for the IndraWorks project must corre-spond with the source directory of archive. The project paths must be identical before archiving and after restore. See" ERROR:LINKED ELEMENT HAS NO LABEL! " on page 19

- Check the details and continue with "Finish" if all settings are correct.
- Project restoring is now started.
- After successful restoring, a dialog with a summary is displayed.
- Confirm this dialog with "Close".
- Open the restored project immediately with IndraWorks.
- Start "Restore..." in IW project in **Motion**.
- MTX archive restoring is now started.
- Acknowledge the welcome dialog box with "Continue".
- Select the MTX archive to restore (here, select only archive part "User FEPROM") and confirm with "Continue".
- Confirm the information by pressing "Finish".
- Now the MTX archive is restored.
- Exit the dialog "Restore MTX archive - summary" with "Close".
- Trigger "NC restart" in IW project in **Motion**.
- Start "CMP60 Control" after complete restart.
- Switch to "Start up mode 6" and trigger a soft reset (SR).
- Switch to "Start up mode 0" and stop the PLC via "PLC button". The pass-word to stop the PLC is "Software".
- Exit the "CMP60 Control".
- Start "Restore..." in IW project in **Motion**.
- MTX archive restoring is now started.
- Acknowledge the welcome dialog box with "Continue".

Restoring Data

- Select the MTX archive to restore, select all archive parts except the "User FEPROM" and confirm with "Continue".
- Confirm the information by pressing "Finish".
- Now the MTX archive is restored.
- Exit dialog box "Restore MTX archive – summary" by pressing "Close".
- Trigger "NC restart" in IW project in **Motion**.
- Trigger a "Download" in IW project in **HMI BTV xxxx**.
- Confirm the confirmation message with "OK".
- Start IndraLogic in IW project in **Logic**.
- Load the PLC program into the control in IndraLogic.

6 IndraControl P60/P40

6.1 General

6.1.1 Introduction

The MTX Control tool is a commissioning and diagnostic program for PC-based IndraMotion MTX CNC controls. It is used to configure, control and monitor the IndraControl P60/P40 CNC module. MTX Control is installed on the user panel as a Windows service; it starts automatically when the PC is switched on. When MTX Control is active, the following symbol appears in the task bar:

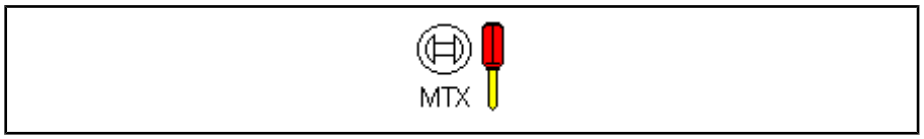

Fig.6-1: "MTX Control" symbol

MTX Control monitors the status of the control and displays basic status information. MTX Control is opened by:

- double-clicking the MTX Control symbol in the task bar, or
- opening the contextual menu by clicking the right mouse button and then choosing menu item View **View**.

6.1.2 Overview

General

After MTX Control is opened, the MTX Control window is displayed as shown below.

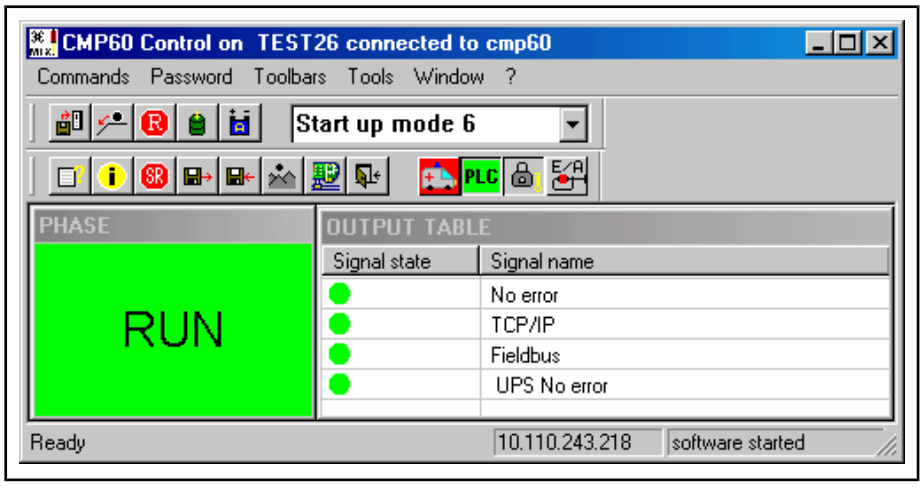

Fig.6-2: Start window

The most important operating and display elements are described in the following:

Display of the startup phase

- In normal operation (Ready), the display **RUN** appears on a green background.
- While the MTX is starting up, the individual phases that the control goes through, and thus the progress of the control startup, are displayed (see sect.chapter 6.1.4 "Startup" on page 32).

IndraControl P60/P40

General status information

Certain basic status information is summarized in a table and is indicated by green, red or gray LEDs:

- **MTX Control error**

  In the case of serious errors due to incorrect installation or to a hardware defect, an error code, incl. plain text, is issued.

- **TCP/IP**

  A green LED shows the faultless functioning of TCP/IP. TCP/IP communication problems are indicated by a red LED.

- **Field bus**

  A green LED indicates that the field bus is working properly. Field bus problems are indicated by a red LED.

- **UPS**

  A green LED indicates that the UPS is working properly. A red LED indicates an error. If a UPS does not exist, a gray LED is shown.

- **Backup battery**

  A green LED indicates that the backup battery has the correct status. If the backup battery is discharged or if a backup battery does not exist, a red LED is shown.

Status line

The following information is displayed in the status bar:

- **IP address**

  The IP address entered in the Windows network configuration is shown. Changes to this address can be made in the Windows control panel. If you want to change the default settings generated during installation, it is recommended that the network administrator carry this out.

- **Working mode**

-----	Monitor program stuck or does not exist
monitor running	Monitor program running
download active	Firmware download running
software downloaded	Firmware download complete
software started	Normal operation

Fig.6-3: Working mode

Tool bars

User level 2 (Service/Development) is required to access the functions of the first tool bar. The functions can be accessed by clicking the mouse or by pressing key combination **Shift + F1** to **Shift + F5**. In some functions, the symbol changes according to the switch state.

	Firmware Download (see also chapter 6.1.8 "Firmware Download" on page 39) Reprogram the firmware. This is done, for example, to update to a newer firmware version.
	MTX Shutdown The MTX is shut down in a controlled manner. Then the internal data are backed up (option). The data are backed up by creating the two files MtxpRoot.pxf and MtxpSram.dat in the Home directory of the MTX.
	Hardware Reset Triggers a hardware reset, which is followed by a startup of the MTX.
	Backup mode ON (default) After the control is shut down, a data backup is executed.
	Backup mode OFF Data backup is switched off. If it is determined during the shutdown that the permitted battery voltage is too low, the data are backed up even if this is OFF.
	UPS mode automatic (default) MTX control executes an automatic recognition of the UPS. If a UPS exists, UPS mode is activated; otherwise, UPS mode is deactivated. Bosch Rexroth UPSs are detected automatically.
	UPS mode ON If a third-party UPS that cannot be detected automatically is used, UPS mode can be switched on manually.
	UPS mode OFF
	Startup mode (see also chapter 6.1.5 "Startup mode" on page 33)

Fig.6-4: Functions of the first tool bar

The functions of the second tool bar can be accessed mainly in user level 1 or 2 (MTB or Development/Service). The functions can be accessed by clicking the mouse or by pressing function keys **F1** to **F12**. In some functions, the symbol changes according to the switch state.

	Calling the Online Help
	Detailed display of the MTX firmware version
	Software reset followed by startup
	Read archive (see chapter 6.1.7 "Archive Function" on page 38)
	Create archive (see chapter 6.1.7 "Archive Function" on page 38)
	Incorporate (mount) external file systems (see section chapter 6.1.9 "Incorporating File Systems (Mount)" on page 41)

	Configuration of Ethernet interface (see chapter 6.1.11 "Ethernet Interface" on page 44)
	Exiting of MTX Control However, the control continues to run. This function should not be used because, if MTX Control is inactive when the user panel is shut down, a shutdown of the MTX is not triggered and the data are not backed up.
	Remote debugger is activated (green)
	Remote debugger is exited (red)
	PLC is started (green)
	PLC is stopped (red)
	PLC outputs are disabled
	PLC outputs are enabled
	PLC fixing is cancelled (green)
	PLC is fixed (red)

Fig.6-5: Functions of the second tool bar

Main menu

All the functions that are provided by the two tool bars can also be accessed from the main menu. In addition, the main menu provides a few additional commands. The commands of the main menu, with brief descriptions, can be found in section chapter 6.1.3 "Main menu" on page 30.

6.1.3 Main menu

The MTX Control main menu contains all the functions that are provided by the tool bars, as well as a few additional functions that are required only in exceptional cases. The following table shows the menu structure and explanations for the individual functions:

Menu entry	Submenu	Explanation
Commands	Firmware Download	see chapter 6.1.8 "Firmware Download" on page 39
	Shutdown	Proper shutdown of the MTX followed by data backup.
	Hardware Reset	Triggers a hardware reset, which is followed by a startup of the MTX.
	Load boot parameters	see chapter 6.1.12 "Boot Parameters" on page 45
	Cleanup Memory	Deletes the DRAM with the exception of the monitor and boot loader memory areas. This function is required only in exceptional cases in Development.
	Cleanup SRAM	Deletes the SRAM (root file system, permanent CPL variables, residual PLC data, residual system data). This function is required only in exceptional cases.
	Cleanup FEPROM	Deletes the FEPROM (firmware, FEPROM file system). This function is required only in exceptional cases.
	Software Reset	Triggers a software reset, which is followed by a startup of the MTX.
	Archive restore	see chapter 6.1.7 "Archive Function" on page 38
	Archive create	see chapter 6.1.7 "Archive Function" on page 38
	Mount	Integrating the external file systems (see chapter 6.1.9 "Incorporating File Systems (Mount)" on page 41)
	Ethernet configuration	Configuration of Ethernet interface (see chapter 6.1.11 "Ethernet Interface" on page 44)
	PLC Run/Stop	Start and stop the PLC
	Clear Force	Delete PLC fix
	Output Enable/ Disable	Enable or disable PLC outputs
	Show System Errors	Display critical system errors
Password	Set Level 0	Reset to user level 0 (see chapter 6.1.13 "User Level" on page 46)
	Change	Modification of password (see chapter 6.1.13 "User Level" on page 46)
Toolbars	Developer toolbar	Show/hide the tool bar for Service/Development
	MTB toolbar	Show/hide the MTB tool bar
Tools	Remote Debugger	Activate and exit the remote debugger
Window	Hide Window	Close MTX Control
	Foreground	Move the MTX Control window to the foreground or the background
	Default size	Reset to default window size

Menu entry	Submenu	Explanation
?	Info about MTX Control	Display the software version of the MTX Control
	Firmware Version	Detailed display of the firmware version
	Software Options	Display the applied software options
	Hardware Info	Hardware information (PCB number, version, serial number)
	Online Help	Calling the Online Help

Fig.6-6: Menu structure in main menu

6.1.4 Startup

The MTX starts up if the user panel is switched on or if a software or hardware reset is activated. The startup occurs synchronized in 12 phases that are displayed in the MTX Control:

P: -3	Determines the existing hardware
P: -2	RTOS startup, configure file systems
P: -1	Start RTOS monitor
P: 1	Initialize basic NCS communication
P: 2	Initialize TCP/IP
P: 3	Initialize BAPAS database
P: 4	SERCOS initialization
P: 5	Start NCB-TCP server
P: 6	Start SERCOS startup
P: 7	Mount the NFS file systems
P: 8	Synchronization with SERCOS
P: 9	Enable NCB-TCP server (communication with user interface)
RUN	Normal operation

Fig.6-7: Display of startup phases

The display differs as follows in the case of critical system errors, boot panic errors and an active shutdown of the MTX:

SF	A critical system fault has occurred
BP	A boot panic error has occurred
SD	Shutdown active

Fig.6-8: Error status display

If the monitor is active, the monitor status is displayed:

M: A	Ethernet active
M: 8	Ethernet inactive
M: L	Loading active

M: d	Deletion active
M: NMI	The monitor is in an NMI routine (error or power down)
M: E	Internal error in monitor
M: H	Hardware unknown

Fig.6-9: Display of active monitor

6.1.5 Startup mode

The startup mode determines the behavior of the MTX during startup. A change to the startup mode becomes effective only during the next startup.

Startup mode	Meaning
0	**Normal operation** All existing data and file systems are retained. The root file system is checked during startup. If a defective file system is detected, a critical system error is displayed. A new (empty) root file system is automatically created during the next startup.
1	**PLC stop** The behavior corresponds to startup mode 0 with the difference that the PLC remains in the STOP state and the PLC user program is not processed.
2	**Reloading the PLC boot project** PLC boot project is loaded to the user FEPROM. Any PLC boot project that exists in the root file system is discarded. Otherwise, the behavior corresponds to startup mode 0.
3	**Protected startup** In extreme cases, faulty machine parameter settings can make it impossible to start up a control. Startup mode 3 is used to carry out a startup in this situation, regardless of the set machine parameters. A startup with the minimum configuration occurs and the set machine parameters are ignored. After the startup, the invalid machine parameter settings can be corrected and a new startup with startup mode 0 can be carried out.
4	**Deleting the permanent CPL variables** The permanent CPL variables will be deleted; otherwise the behavior corresponds to startup mode 0.
5	**Cold start** The power-up management logic is not run; otherwise, the behavior corresponds to startup mode 0.
6	**Bootstrap** A new root file system is created; as a result, all the data of the old file system are lost. If an intact user FEPROM file system exists, the PLC boot project and configuration data are loaded from there.
7	**Creation of the user FEPROM file system** The user FEPROM is created; as a result, all the data of the old file system are lost. This is required, for example, if a user FEPROM file system is defective. The root file system remains. The permanent CPL variables will be deleted.

Startup mode	Meaning
8	Identical to startup mode 9
9	**Debug mode** This is the usual debugging mode if the control should not automatically start up after a reset. After the basic monitor is initialized, the boot loader is activated and the subsystems are loaded automatically.
10	**Debug mode (without automatic loading)** After the basic monitor is initialized, the boot loader is activated. Then loading can take place using TCP/IP.
11	**Debug mode (without activating the boot loader)** The basic monitor is initialized. Then loading can take place using TCP/IP.
12	Identical to startup mode 15
13	Identical to startup mode 15
14	Identical to startup mode 15
15	**Debug mode (basic monitor start)** Only the basic monitor is activated.

Fig.6-10: Startup mode

6.1.6 Data backup

CNC module IndraControl P60/P40 has a non-volatile memory: the flash EPROM memory is permanent; no buffering is required. During the firmware download, the firmware and the FEPROM file system are copied to the flash EPROM. These areas change only during a firmware download; on the other hand, the user FEPROM is designed to be used to store configuration data – it can be changed at any time.

The SRAM is designed for user data. Residual PLC data, permanent CPL variables and residual system data are stored here. Furthermore, the root file system is located in the SRAM. It contains parts programs and tables as well as any other user data. Since the SRAM is battery-buffered, the data are retained even after the system is switched off. As an additional safety feature, the data in the SRAM are backed up when the MTX is shut down:

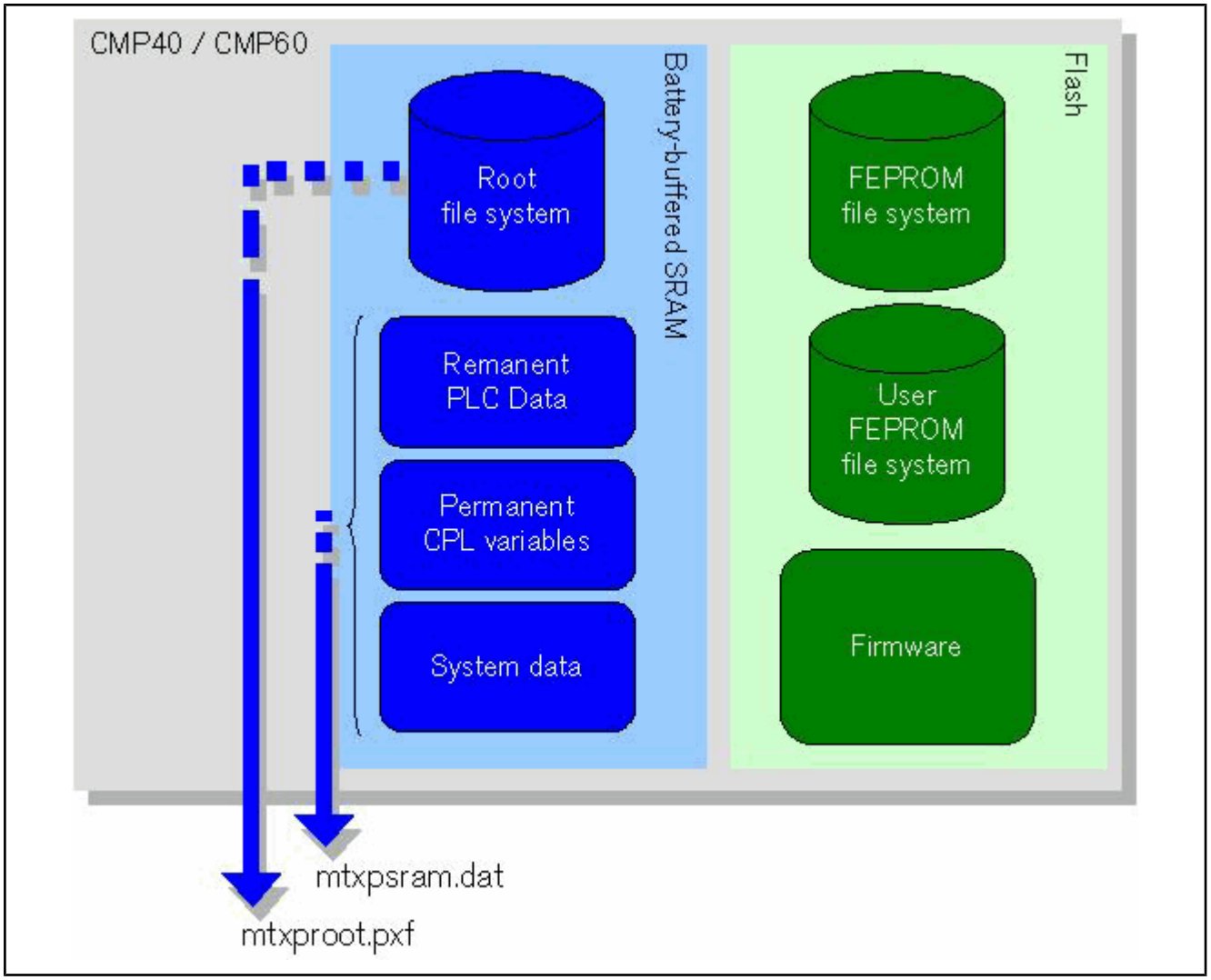

Fig.6-11: Data backup

- File mtxproot.pxf contains the entire root file system.
- File mtxpsram.dat contains residual PLC data, permanent CPL variables and residual system data.

Backing up the data in the SRAM can be suppressed by switching off backup mode (see section chapter "Tool bars" on page 28).

The consistency of the data in the SRAM is checked when the system is switched back on. The accuracy of the consistency check depends on the existence of a UPS. Normally, UPS mode Automatic (see chapter "Tool bars" on page 28) is active, i.e. the USV is detected automatically. If a UPS exists, a checksum is generated for the data areas in the SRAM when shutting down. If a UPS does not exist, a checksum is not calculated when shutting down. As a result, a checksum is not checked during the next startup; instead, only a simple consistency check is carried out.

If there is no error, the MTX starts up normally. If there is an error, startup does not occur; instead, the user is informed of the error situation:

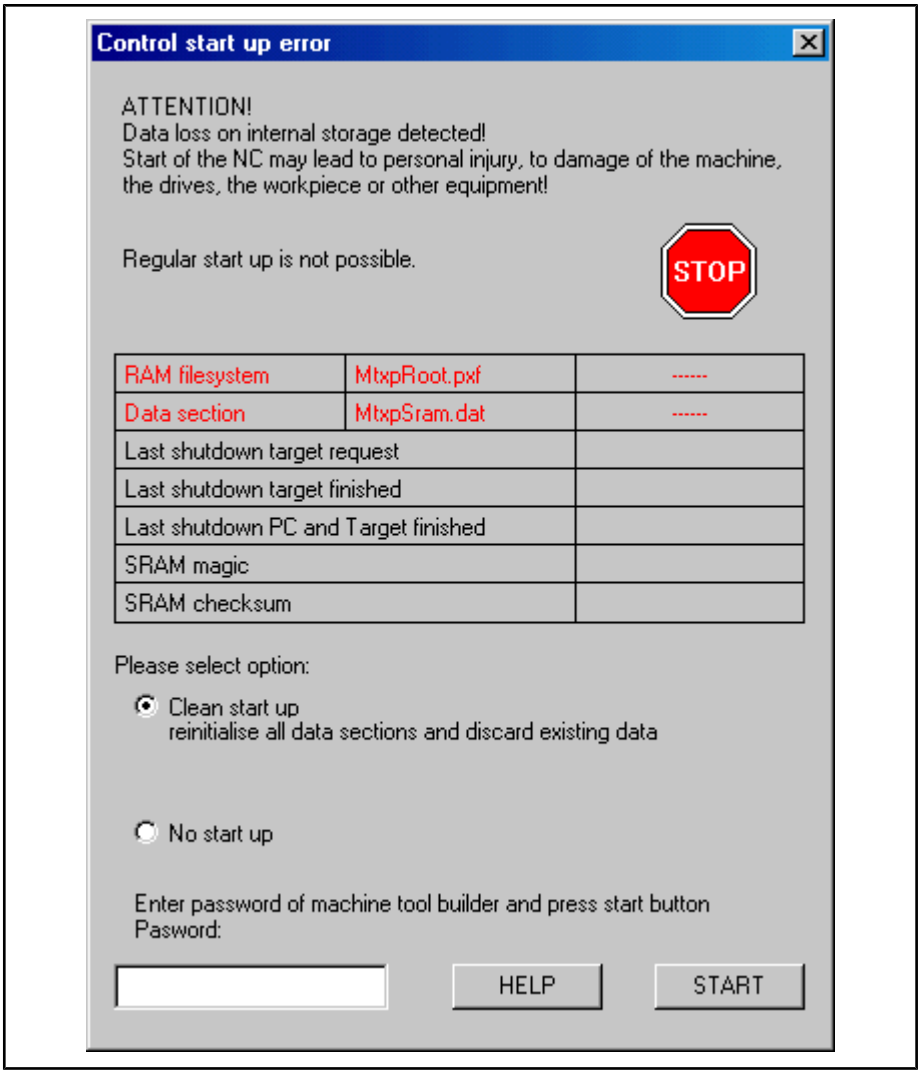

Fig.6-12: Error situation

The backup files that were created last are indicated as follows:

?	File exists and contains no errors.
---	File does not exist.
∑	File has a checksum error.
HW	Hardware incompatibility Can occur after hardware replacement.

Fig.6-13: Indication of backup files

The interrupted startup can be continued with one of the following options. The password for the user level is required for this:

- Clean startup:
  control startup without using the existing backup files.
- Startup with the last saved data files:
  control startup with the existing backup files (if these contain no errors).
- No startup
  No startup occurs; the monitor is activated.

If the **HELP** button is pressed, a note with the following explanations is issued:

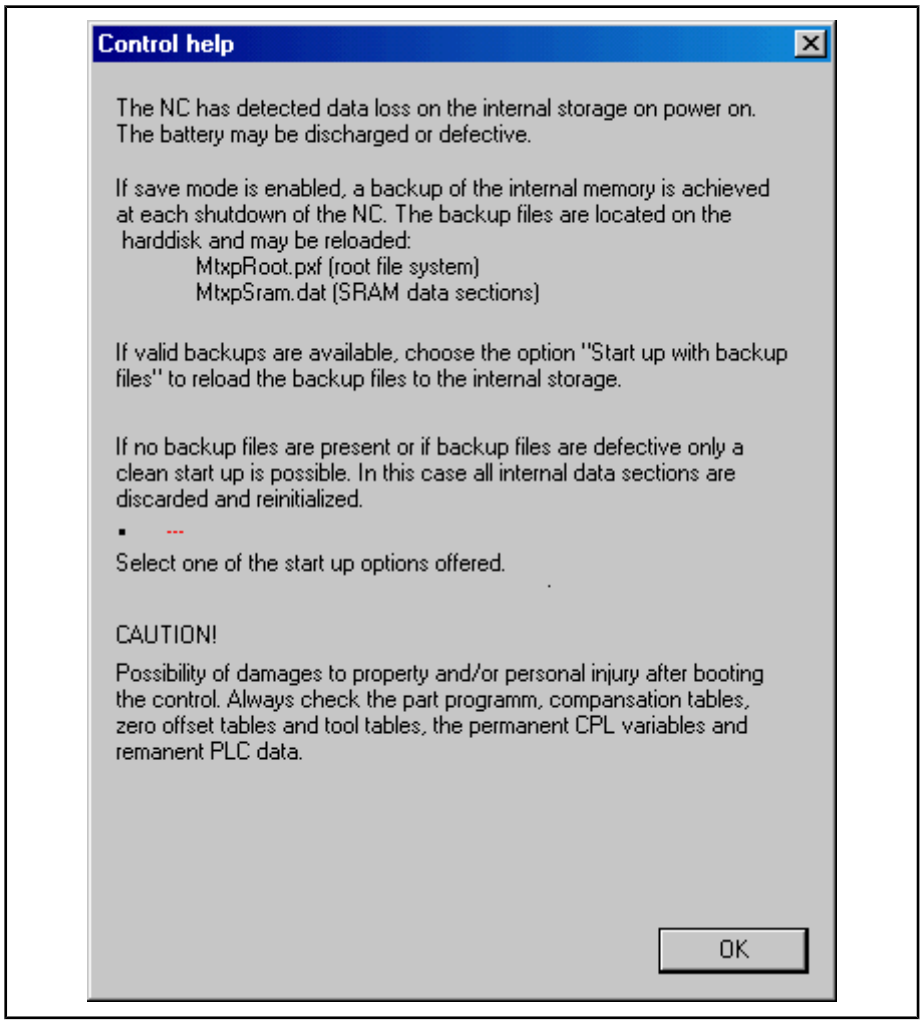

Fig.6-14: Help dialog box

After the desired start options have been selected and the **START** button is pressed, another message box is displayed:

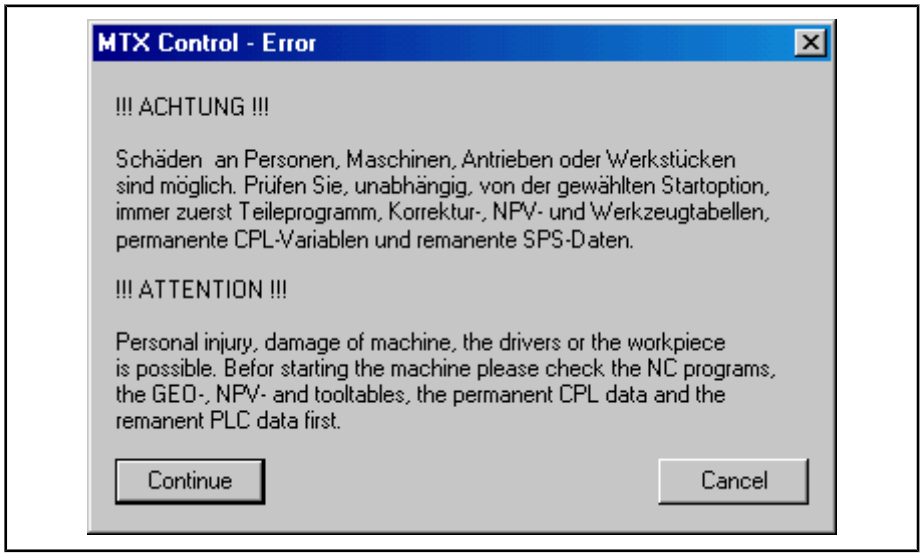

Fig.6-15: Message box

The startup is carried out by pressing the **Continue** button.

WARNING

Regardless of the selected start option, check the MTX data after a successful startup. Invalid or expired data can cause personal injury or material damage to the machine, the drives or the workpiece. As a result, it is absolutely required that parts programs, ZO tables, correction tables, tool tables, as well as permanent CPL variables, residual PLC data and system files be checked!

6.1.7 Archive Function

The archive function allows you to save the MTX user data and to restore them at a later point in time. The archived data are saved to a mounted directory in the form of an archive. If needed, the archive can be read to restore all the data.

- An archive is generated using the menu **Commands/Archive create** or directly using symbol .
- An archive is read to restore data using the menu **Commands/Archive restore** or using symbol .

Parts programs and the PLC must be stopped before an archive can be generated or restored.

The data can be archived/restored either wholly or selectively. The data areas are selected in the subsequent window:

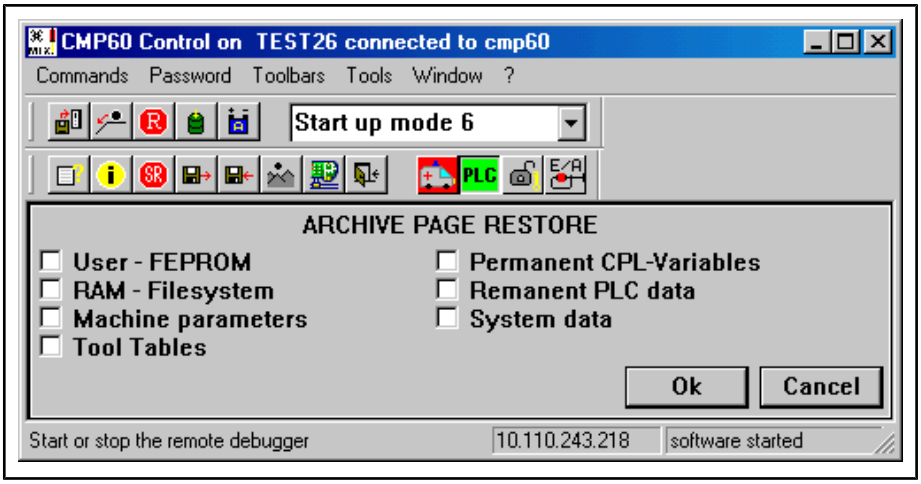

Fig.6-16: Data area selection

- **User - FEPROM**
  All the files that are stored in the user FEPROM
- **RAM - Filesystem**
  All the files that are stored in the root file system
- **Machine parameters**
  MTX machine parameters
- **Tool Tables**
  MTX tool tables
- **Permanent CPL-Variables**
  Permanent CPL variables
- **Remanent PLC data**
  Remanent data of PLC

- **System data**
  MTX system data

After pressing the OK button or the Enter key, another dialog box opens in which the name and path of the archive (extension = .tar) is entered. The archive is saved to a mounted directory.

The dialog box is closed if the Cancel button or the Esc key is pressed. Pressing OK starts the archiving procedure, which can take a few minutes. Any errors that occur are recorded in a log file, which is automatically displayed when archiving is complete.

6.1.8 Firmware Download

Firmware Download is used to update the MTX firmware. This is necessary, for example, after you have updated the MTX software on your user panel.

The firmware is transferred from the hard disk to the MTX and is saved to the flash EPROM. Downloading is started using the menu (Commands/Firmware Download) or directly using symbol  .

The user data should be archived before executing Firmware Download. See section chapter 6.1.7 "Archive Function" on page 38 to find out how to generate an archive.

All parts programs must be stopped before executing Firmware Download. The PLC must also be brought into the Stop state.

The following message explicitly notifies the user that the MTX will be stopped before Firmware Download:

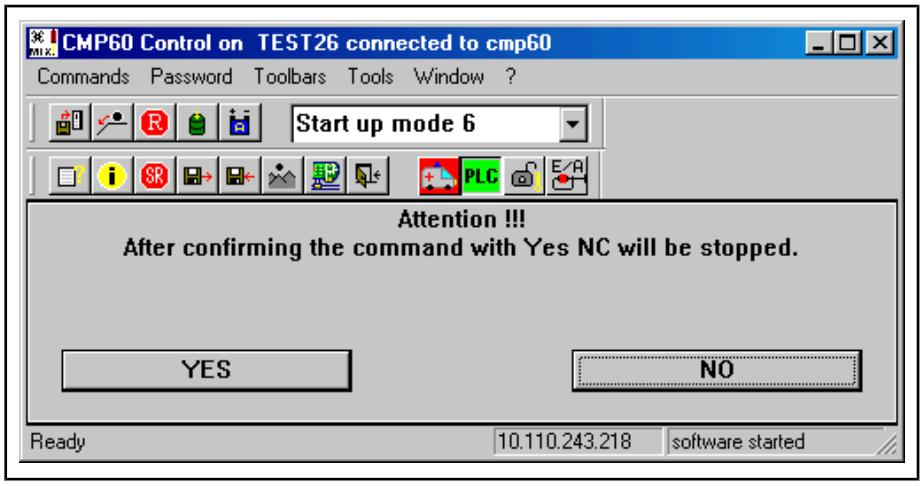

Fig.6-17: Alert message

After the note has been acknowledged by pressing the YES button, the components that are to be loaded are selected. Normally, only the first component, i.e. only the firmware, needs to be selected.

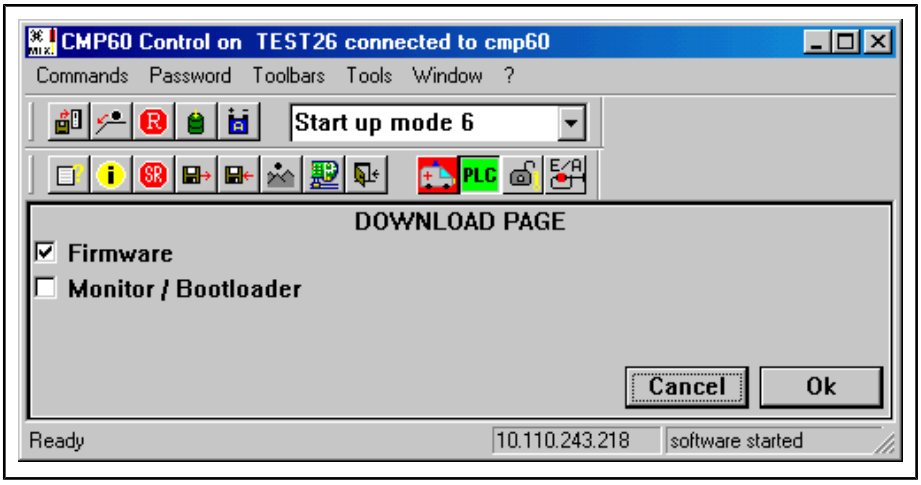

Fig.6-18: Selection window

The selection is also completed by pressing the OK button; the actual loading procedure starts then. The following display appears during the loading procedure:

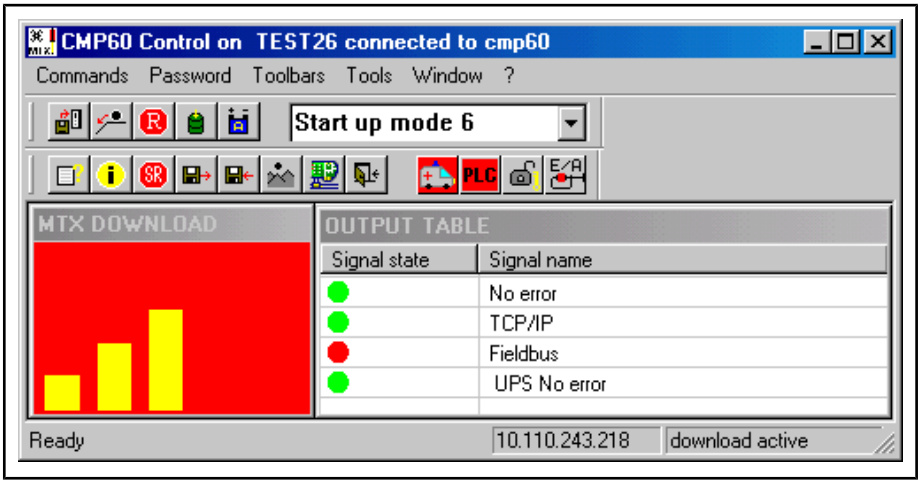

Fig.6-19: Loading process

After a successful loading procedure, the MTX must be restarted using Hardware Reset.

If errors occur during Firmware Download, they are logged in file mtxcontrol.tlg. The portion of the file that informs the user of errors that have occurred appears as follows.

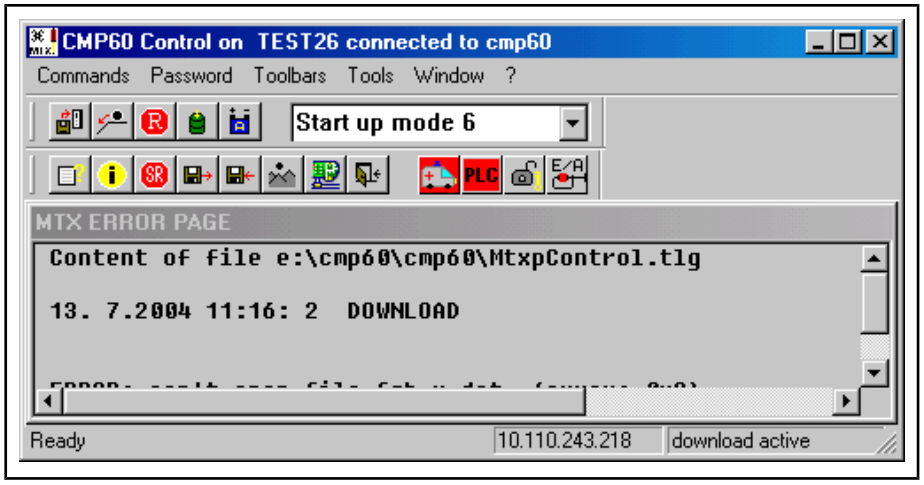

Fig.6-20: Error message

6.1.9 Incorporating File Systems (Mount)

General

In addition to the internal root file system, the MTX offers the possibility of incorporating external file systems using NFS. NFS (Network File System) is a standard used to distribute file system resources in the network. An NFS server provides one or more file systems in the network (exporting) that can be “mounted” (importing) by NFS clients.

It is possible to mount any directory onto the hard disk of the local user panel or a USB memory stick, a disk drive or a CD/DVD drive on the USB port of the user panel in the internal directory tree of the MTX. On the other hand, directories on external PCs (e.g. a file server) that are connected via the network to the local user panel can be incorporated.

If a standard installation has been made, directory **c:\mnt** is mounted and the control is attached in the file system under mount point **/mnt**.

Further file systems are incorporated using the menu **Commands/Mount** or directly using symbol  :

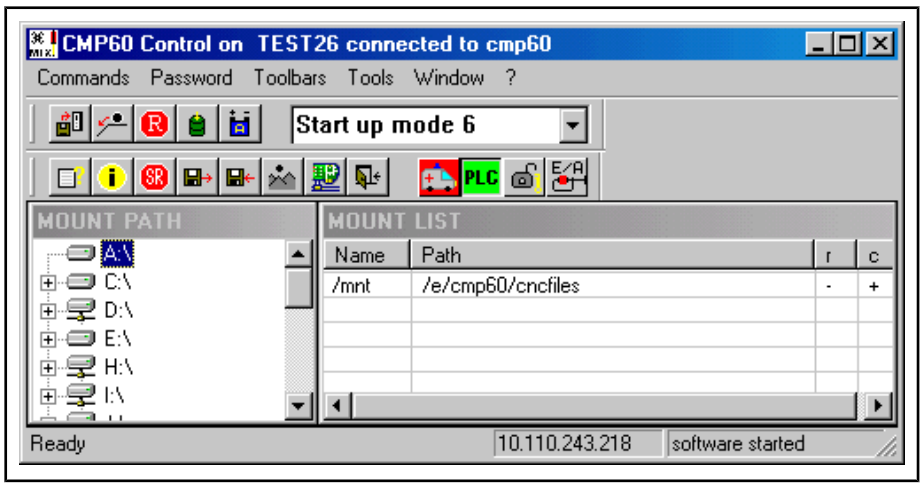

Fig.6-21: “Mount” dialog window

The left side of the dialog box that then opens contains a list of the currently incorporated directories (MOUNT LIST). The right side (MOUNT PATH) shows the file system of the local PC. Additional directories that are also to be incorporated can be selected by navigating in this area.

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Using the dialog box

Cursor keys

Navigation in both areas

Double-click right mouse button

- In the MOUNT PATH area

  The selected path is adopted in the list of incorporated directories. The list can contain up to 10 entries. If an existing entry is highlighted before the transfer, it is overwritten by the new path.

- In the MOUNT LIST area

  The selected entry is removed from the list.

Ctrl+S

The same as double-clicking the right mouse button in the MOUNT PATH area.

Function Key F2

The properties of the entry highlighted in the list of incorporated directories can be modified. When changing the name, ensure that this always starts with a "/" and that the name does not already exist in another entry. If an error occurs, a corresponding error message is issued. Other properties in addition to the name can be modified:

- **r+**

  The selected directory is incorporated in read-only format. The data can be read from the MTX, but they cannot be modified.

- **r-**

  The selected directory is incorporated in read and write format.

- **c+**

  Activates the cache for this directory

- **c-**

  Deactivates the cache for this directory

Function Key F5

Updates the display

Escape Key

Exits the dialog box. All changes are discarded.

Return Key

Adopts the changes and closes the dialog box.

Tab Key

- Switches between the MOUNT PATH and MOUNT LIST areas.
- Closes the Edit window for the name in table MOUNT LIST.

After the dialog box is closed by pressing **Enter**, the entered data are saved as boot parameters, i.e. the changes are saved in the boot parameter file and transferred to the MTX.

The boot parameters are evaluated only during the next startup of the MTX, i.e. you must execute a software or hardware reset to let the new settings go into effect.

Incorporating directories on external PCs, such as a file server in the user panel network, can be accomplished only by manually modifying the boot parameter file. You can find more information in section chapter 6.1.12 "Boot Parameters" on page 45.

6.1.10 Use the USB stick of the MTX as the mount directory

General

Configuration

The root directory of a USB stick should be mounted. The MTX will name it “USB” directory.

It is not recommended to mount a subfolder on an USB stick. This will lead to various errors in connection with a soft reset when the stick is not inserted.

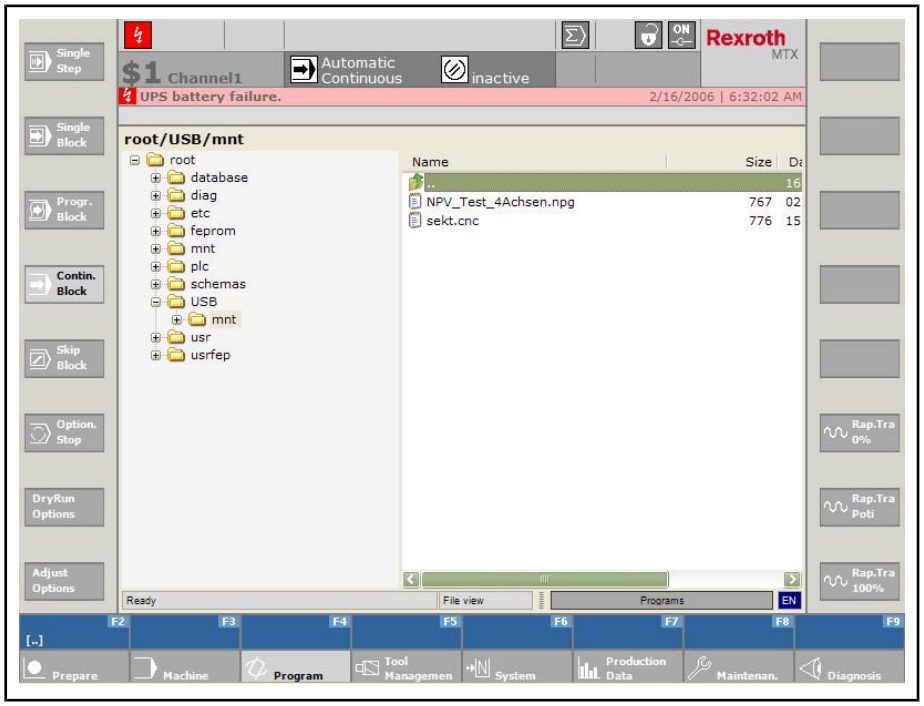

Fig.6-22: Root directory of a mounted USB stick

MTX Boot Parameter

1. Adjust file ...\IndraWorks\mtx\mtxctrl\pccpboot307078.ini as follows.

Program:

```
#BPAR
#STUPFILE
NFSMOUNT 192.168.142.249:/C/mnt /mnt rw c+
NFSMOUNT 192.168.142.249:/e /USB rw c-
#ESTUPFILE
#NET
IPADDR 0.0.0.0
SNMASK 0.0.0.0
GWADDR 0.0.0.0
#ENET
#EBPAR
```

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Only one mount directory at a time can be cached internally with “c+”. All other mounts should be chached with “c-”.

1. Select menu item “Load boot parameter” in the MTX control.

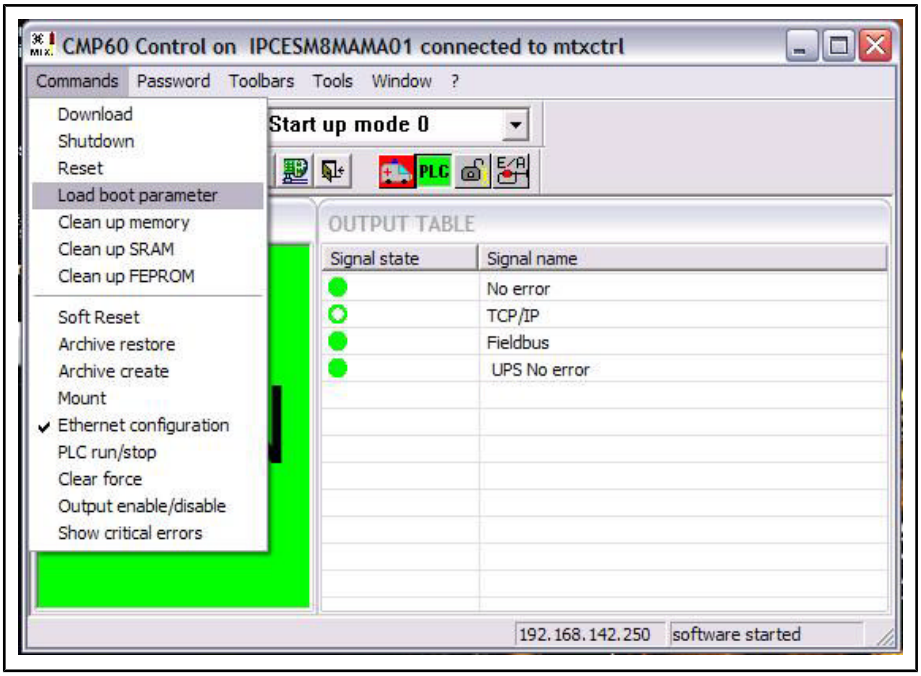

Fig.6-23: Load boot parameter

NFS Parameter

1. Adjust file ...\IndraWorks\mtx\bin\export.us as follows:

Program:

```
C:\mnt mtxctrl localhost
E:\ mtxctrl localhost
```

1. Reload (right mouse button on symbol in the taskbar)

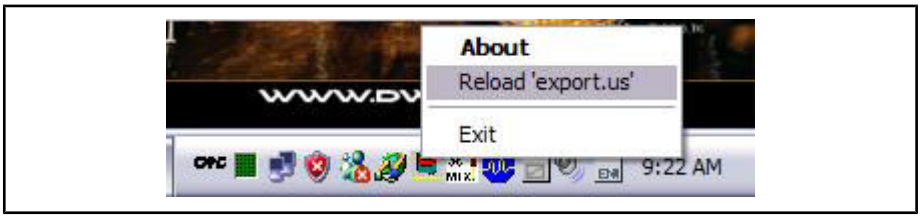

Fig.6-24: Reloading "export.us"

Carry out a soft reset (SR) of the MTX.

Fig.6-25: Executing a soft reset

6.1.11 Ethernet Interface

CNC module IndraControl P60/P40 has an on-board Ethernet interface.

The interface is configured using the menu (**Commands/Ethernet Configuration** or directly using symbol  .

The current settings are displayed in the following entry screen.

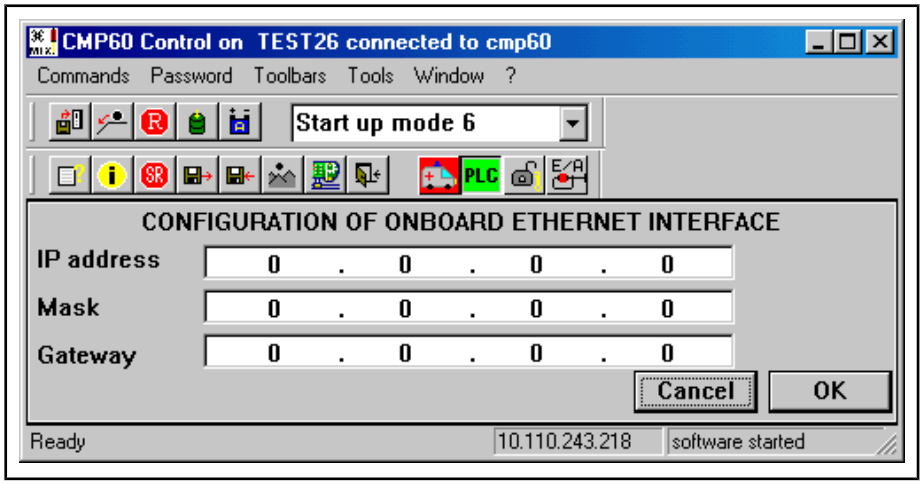

Fig.6-26: Input menu

The displayed parameters IP address, Subnet screen and Standard gateway can be modified. The new values are adopted by pressing the **OK** button. The entered data are saved as boot parameters, i.e. the changes are saved in the boot parameter file and transferred to the MTX.

The boot parameter will not be evaluated until the next startup of the MTX. A software or hardware reset must be executed so that the new settings can go into effect.

If the entry screen is closed by pressing **Cancel**, all the changes are discarded and the parameters remain as they were.

If the Ethernet interface is not configured, all parameters have a value of zero.

The IndraControl P60/P40 is integrated as a network card into the Windows operating system. As a result, from a logic point of view, two interfaces exist.

The first interface uses the PCI bus. This interface is used mainly for communication with the MTX interface and with the PLC programming system. It is configured in the Windows Control Panel.

The second interface is the Ethernet interface on the IndraControl P60/P40 module (on-board), whose configuration is described here.

6.1.12 Boot Parameters

The MTX boot parameters are located in file **mtxpboot<** PCP number **>.ini** in the home directory of the control. (The PCB number can be determined using the menu entry in the main menu – also see chapter 6.1.3 "Main menu" on page 30.) In every software or hardware reset, the boot parameters are read from this file and copied to the SRAM. Then startup occurs with the current boot parameters.

If the mount parameters or the Ethernet interface configuration is changed, the set values are saved to the boot parameter file and are copied to the SRAM.

The boot parameter file contains information about the incorporated external file systems and the configuration parameters of the Ethernet interface.

```
#BPAR
#STUPFILE
NFSMOUNT 192.168.142.249:/c/mnt /mnt rw c+
#ESTUPFILE
#NET
IPADDR 142.3.0.1
SNMASK 255.255.255.0
GWADDR 142.3.0.18
#ENET
#EBPAR
```

The section starting with #STUPFILE is used to input the mount parameters; it is completed with #ESTUPFILE. An entry with keyword NFSMOUNT exists for every incorporated file system. The listed parameters depend on the entries made during installation. The example above applies to the default installation.

Another section is identified by #NET and #ENET. The Ethernet interface parameters are located in this section.

To avoid the incorrect setting of parameters, the boot parameter file should not be modified manually. Modifications should be made only with the corresponding MTX Control dialog boxes (see section chapter 6.1.9 "Incorporating File Systems (Mount)" on page 41 and chapter 6.1.11 "Ethernet Interface" on page 44).

6.1.13 User Level

Numerous functions are password-protected to prevent access to unauthorized persons. MTX Control administrates three user levels:

- **Level 0** (user):

  functions that every user may use.
- **Level 1** (machine manufacturer):

  commands to control the MTX and the integrated PLC.
- **Level 2** (service/developer):

  commands for specific stopping and starting of the MTX control (data loss possible).

Higher user levels automatically also have access to all the functions of the subordinate user level.

Changes to the user level always are in effect only until midnight. When the date changes, the user level is automatically reset to 0. An explicit reset can be carried out using the menu **Password/Set level 0**.

If a function that is not permitted in the current user level is selected, a request for entering the password for the required user level appears. The following is an example for user level 2:

Fig.6-27: Password entry

After the correct password has been entered and confirmed by pressing **Enter**, the requested function is executed. The entry can be cancelled by pressing **Esc**; in this case, the requested function is not executed.

The passwords defined by Bosch Rexroth can be changed at any time. This is accomplished using the menu **Password/Change**. Then the following entry screen is displayed:

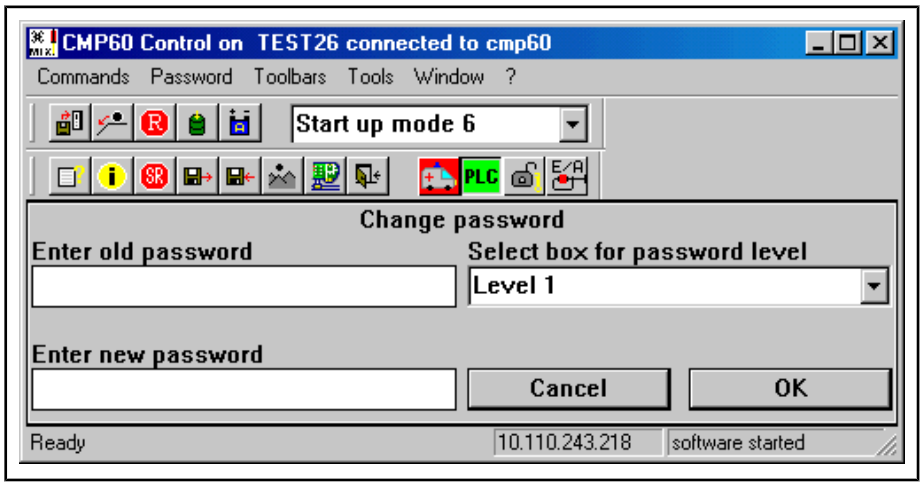

Fig.6-28: Change password

Proceed as follows to change a password:

- **Select box for password level (select the user level)**

  The user level for which the password is to be changed is set here.

- **Enter old password**

  The password can be changed only by entering a valid password. Enter the current valid password here.

- **Enter new password**

  After the new password has been entered, it must be entered again in the same window for confirmation. The text above the entry field changes from **Enter new password** to **Verify new password**. If the entries agree, the password change goes into effect by pressing the **OK** button or **Enter**.

If **Esc** or the **Cancel** button is pressed, changing the password can be cancelled at any time.

6.1.14 Contextual Menu

If you click the right mouse button on the MTX Control symbol in the taskbar, the MTX Control contextual menu opens. It provides the following possibilities:

- **View**

  MTX Control is opened. You can find a description of the most important display and operating elements in section chapter 6.1.2 "Overview" on page 27.

- **Help**

  Call online help.

- **Exit**

  Exit MTX Control. The control continues to run anyway. This function should not be used because, if MTX Control is inactive when the user panel is shut down, a shutdown of the MTX is not triggered and the data are not backed up.

6.1.15 Call Parameters

During installation, MTX Control is installed as a Windows service on the user panel. Starting MTX Control as a Windows application using the command line or using a link is thus not necessary. The following is provided for information purposes only.

Call parameters generally begin with the character “/” or “-” (e.g. /install or -install). The individual parameters have the following meanings:

- **install**

  Installs MTX control as a Windows service. This occurs during installation.

- **remove**

  Uninstalls the Windows service MTX Control. This occurs, for example, during uninstallation of the MTX software.

- **no service**

  Starts MTX Control as an application.

- **task**

  The MTX Control symbol is shown in the taskbar if MTX Control is active.

- **view**

  Opens the MTX control window.

- **target <IP address or target name>**

  Shows the IP address or the name of the MTX with which MTX Control is connected. If this parameter is missing, a connection is made to the first MTX in the system.

- **h or ?**

  Displays the list of parameters described here.

6.2 IP Address

6.2.1 Overview

Each basic PC device contains

- an IndraControl P60/P40 plug-in card with an internal network connection in a separate subnet
- an Ethernet connection.

Example:

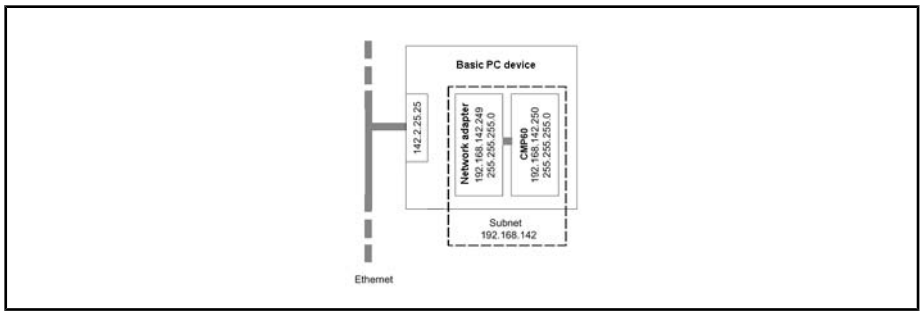

Fig.6-29: Plug-in card in basic PC device

6.2.2 Configuration of Communication Interface

General

The data exchange between the basic PC device and the IndraControl P60/P40 plug-in card takes place using **TCP/IP**.

The IndraControl P60/P40 plug-in card and the network adapter are treated as an internal subnet with fixed IP addresses.

During configuration, the IndraControl P60/P40 plug-in card is assigned a fixed IP address which makes it possible for the basic PC device to communicate with this card. In addition, a default setting is assigned to the symbolic name for the IndraControl P60/P40 plug-in card.

- Check and make note of the settings if **changes** are to be made to the current IP addresses.

☞ All following settings correspond to the Setup defaults.

Set IP address network adapter

Proceed as follows to check or adjust TCP/IP settings for the network adapter of the IndraControl P60/P40 plug-in card:

1. Select the Windows XP menu: **Start – Settings – Network Connections** .
2. Choose LAN connection “PCC-P Numerical Controller”.
3. Choose **File – Properties**.
4. Choose “TCP/IP Internet protocol”.
5. Press the “Properties” button.
6. Check the settings for the IP address and the subnet screen:
   - The IP address is: 192.168.142.249
   - The subnet screen is: 255.255.255.0

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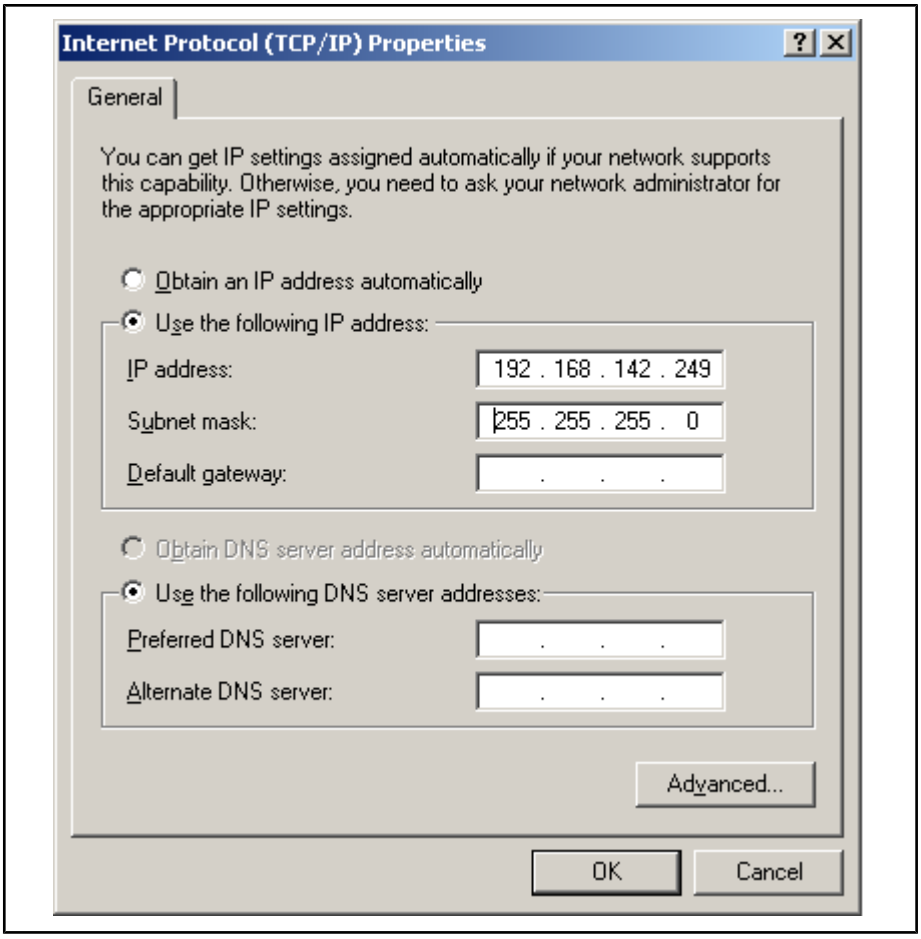

Fig.6-30: IP addresses

If the IP addresses mentioned above differ from the defaults in the standard installation, take note of the current IP addresses for the next software update so that you can adapt your control to the local network.

Set IP address of IndraControl P60/P40 plug-in card

The IndraControl P60/P40 plug-in card is known as “PCC-P Numerical Controller” in the system.

Proceed as follows to check or adjust the IP addresses for the IndraControl P60/P40 plug-in card:

1. Select the Windows XP menu: **Start – Settings – Network Connections** .
1. Choose LAN connection “PCC-P Numerical Controller”.
2. Choose **File – Properties**.
3. Press the “Configure” button.
4. Select tab “Advanced”.
5. In the “Property” window, check and, if necessary, adjust the following entries:
   - **PCC-P Default Gateway:**The default address of the network adapter is: 192.168.142.249. It must always be located in the following subnet.
   - **PCC-P IP Address:** The default IP address is: 192.168.142.250

- **PCC-P Name:** Symbolic name of the plug-in card installed in “Set-up” (default: “mtxctrl”).
- **PCC-P Subnet Mask:** The default subnet is: 255.255.255.0

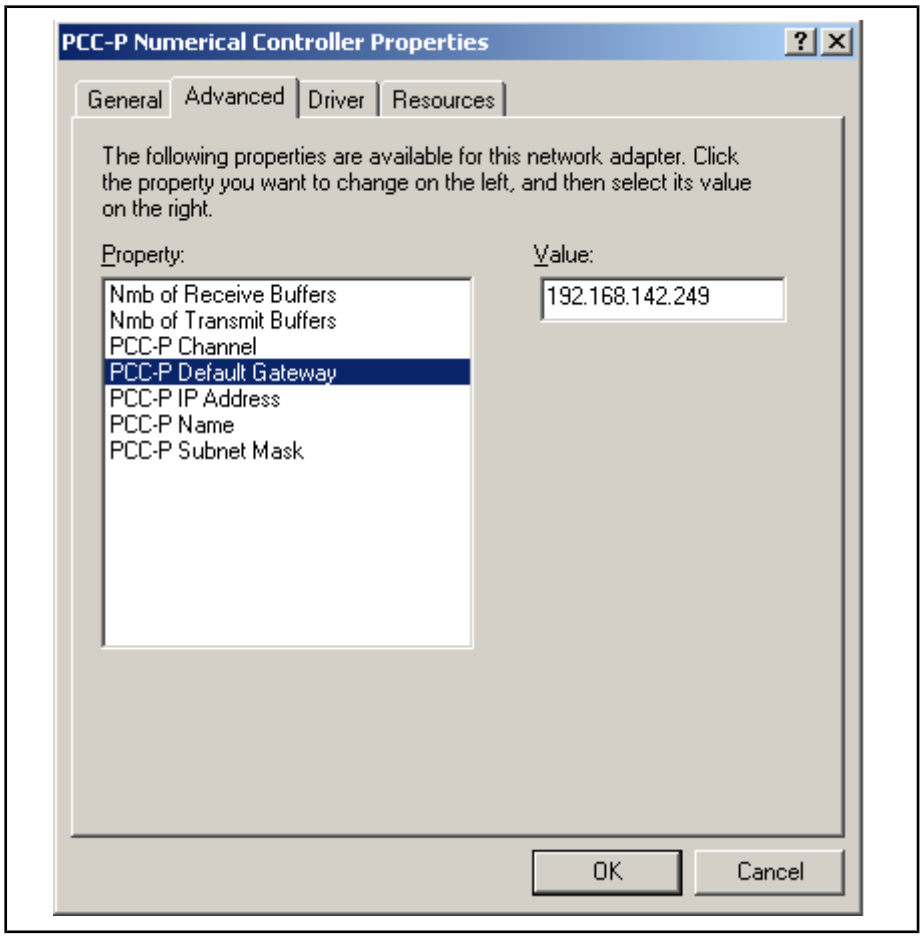

Fig.6-31: Settings of IndraControl P60/P40 plug-in card

Ethernet connection of basic PC device

If the basic PC device is also connected to a network, communication takes place using the Ethernet connection via TCP/IP. A fixed IP address is also required for this connection.

☞ Check and make note of the TCP/IP and network card settings for the existing hardware components if changes are to be made to the current IP addresses.

The IP addresses may have to be adjusted if:

- a search is made for another IP address for the basic PC device during a PNC software update.
- several basic PC devices are located in a company network and additional basic PC devices will be added using PNC-P.
- the address of the company network has changed.
- the entries were overwritten after reinstalling Windows on the basic PC device.

6.2.3 Order of Network Connections

When Windows XP is installed, a standard network connection which is called “LAN connection” is set up automatically. The basic PC device can be connected to a network with this connection. This “LAN connection” must be first in the order of network connections.

If the basic PC device is equipped with an IndraControl P60/P40 control module; after driver installation, another network connection is displayed - this must be the second network connection. The name of the second network connection can be selected freely (e.g. IndraControl P60).

The order of network connections can be checked or corrected as follows: **Start ▸ Settings ▸ Network connections ▸ "Extended" tab ▸ Extended settings**

In the connections window:

1. LAN connection
2. CMP 60
3. any further network connections ...

☞ By highlighting the corresponding network connection and then clicking “Arrow up” or “Arrow down”, the order can be modified in the “Connections” window.

6.3 Network Settings

6.3.1 General Information

You can obtain detailed information about the TCP/IP protocol or about the network settings from your network administrator and/or in the Microsoft operating system documentation.

☞ It is recommended that your network administrator make all network-related settings.

6.3.2 Enabling a CD Drive in a Network

Access authorizations

Before a CD-ROM drive can be accessed from another computer (client PC), it must be enabled, i.e. permission to use this unit on the computer in which the drive is installed (server PC) must have been granted.
In Windows, the administrator can set up “groups” with a “user profile” for corresponding privileges to enable network drives. If no such “group” has been defined, only the administrator can carry out enablement.

1. Insert the CD with the software into the CD-ROM drive of the server PC.
1. Click the symbol “My Computer” and then “CD-ROM”.
2. Select menu**File ▸ Enabling and safety...** “Enabled as”.
3. Select tab “Enablement”.
4. Activate “Enable this folder in the network”.
5. Enter “CD” as the enablement name.

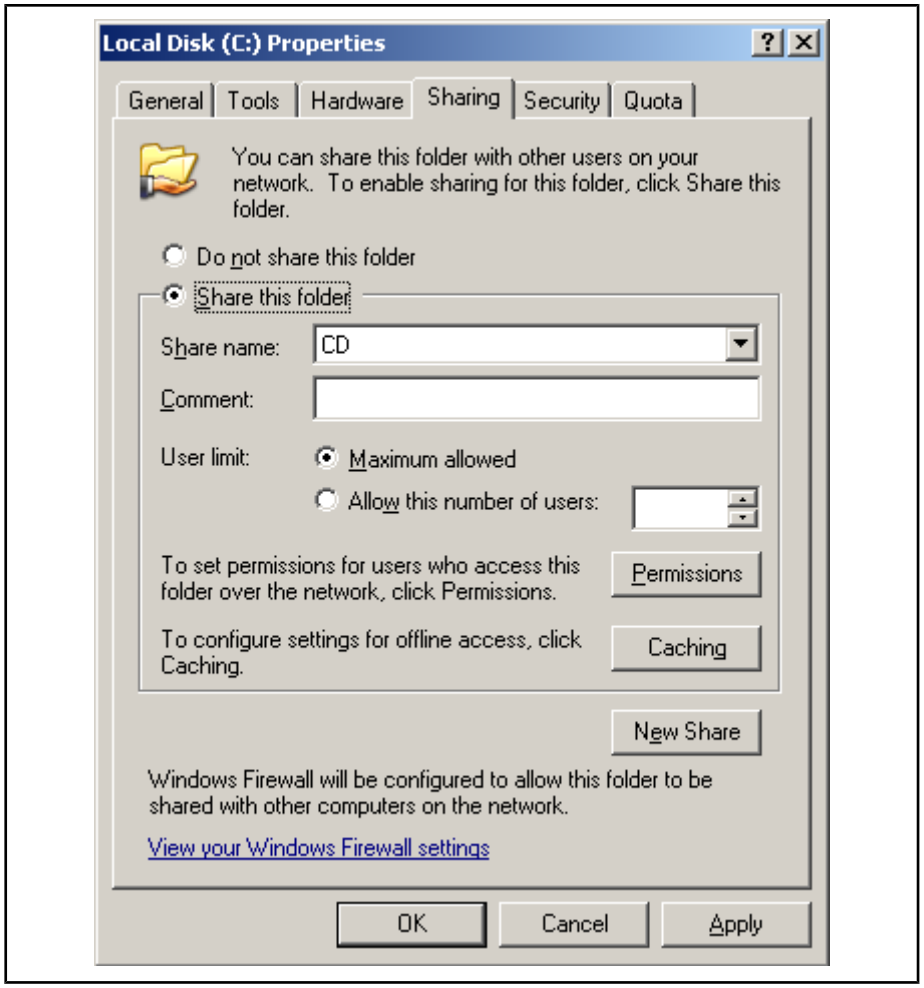

Fig.6-32: Enabling a network drive

You can recognize the enabled CD-ROM drive by its symbol.

6.3.3 Connecting to a Network Enabled in the CD-ROM Drive

The computer to which access to the CD-ROM drive is to be assigned (client PC) must connect the enabled CD-ROM drive of the server PC with its file system (directory).

Search for the enabled CD directory “CD” on the server PC:

1. Choose Network environment.
2. Press the “Search” button in the toolbar.
3. Enter the name of the server PC (e.g. IPCREXIND01) and click the “Search” button.

1. Click the symbol of the server PC and search for the enabled drive “CD”.
2. Click “CD” and choose **File - Network Connect...**.
3. Now assign a drive letter (e.g. “Z:”) to “CD”. If this is set up by the administrator, access to the server PC requires a password before a network connection can be established.

4. Insert the CD-ROM into the drive.
5. In Windows Explorer, check whether the contents of the CD are read.

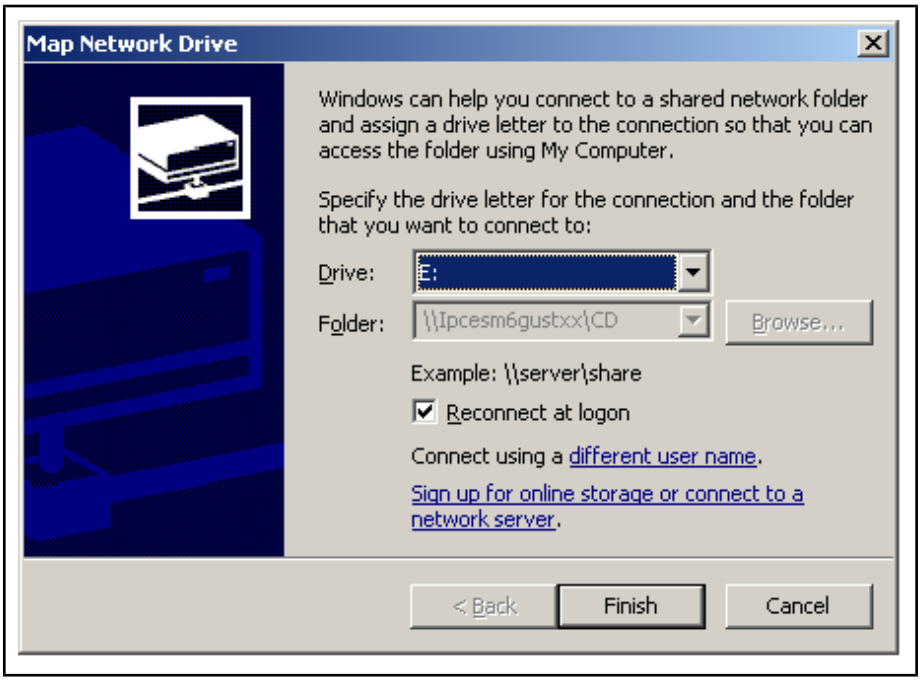

Fig.6-33: Connecting a network drive

6.3.4 Access to the IndraControl P60/P40 from an External PC (Routing)

Overview

Applications such as IndraWorks or IndraLogic can access a basic PC device with an IndraControl P60/P40 plug-in card from any network PC via Ethernet. In this case, a route must be entered on the network PC.

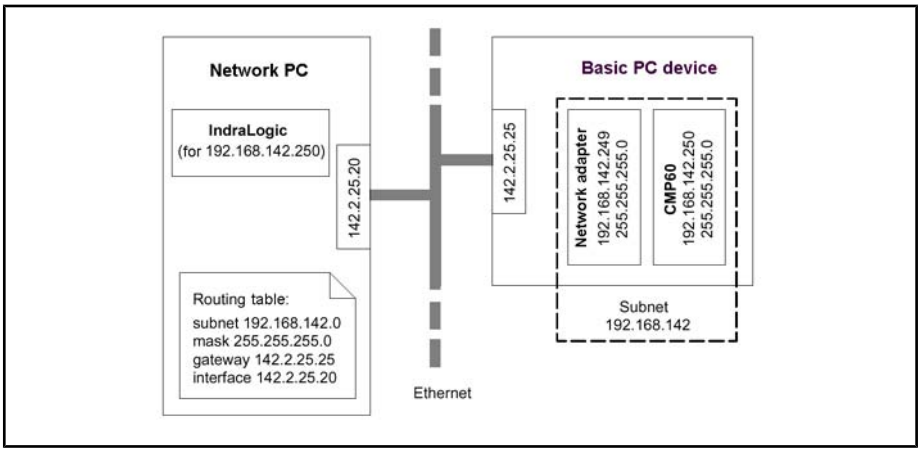

Fig.6-34: Example of external access

Conditions

The network PC and the basic PC device must be located in the same subnet. Example (subnet 142.2.25.0):

- Network PC: IP address 142.2.25.20
- Basic PC device: IP address 142.2.25.25

“IP forwarding” must be activated in the basic PC device.

- Automatic entry in the Registry for installation of the IndraControl P60/ P40software.

Entering a route

A route for PNC-P subnet 192.168.142.0 must be entered on the network PC.

- To do this, run the following MS-DOS command line:

route add -p <subnet address> MASK <subnet mask> <IP address of basic PC device>

Example: route add -p 192.168.142.0 MASK 255.255.255.0 142.2.25.25
(Parameter “-p” stands for permanent route)

7 IndraControl L40

7.1 Firmware Download MTX Compact per IW Engineering Desktop

The Firmware of IndraControl L40 can be updated via Engineering Desktop with the Firmware Management dialog. Calling the dialog via context menu of device node “IndraMotion MTX L40” or - for selected device node - called with the homonymous menu item:

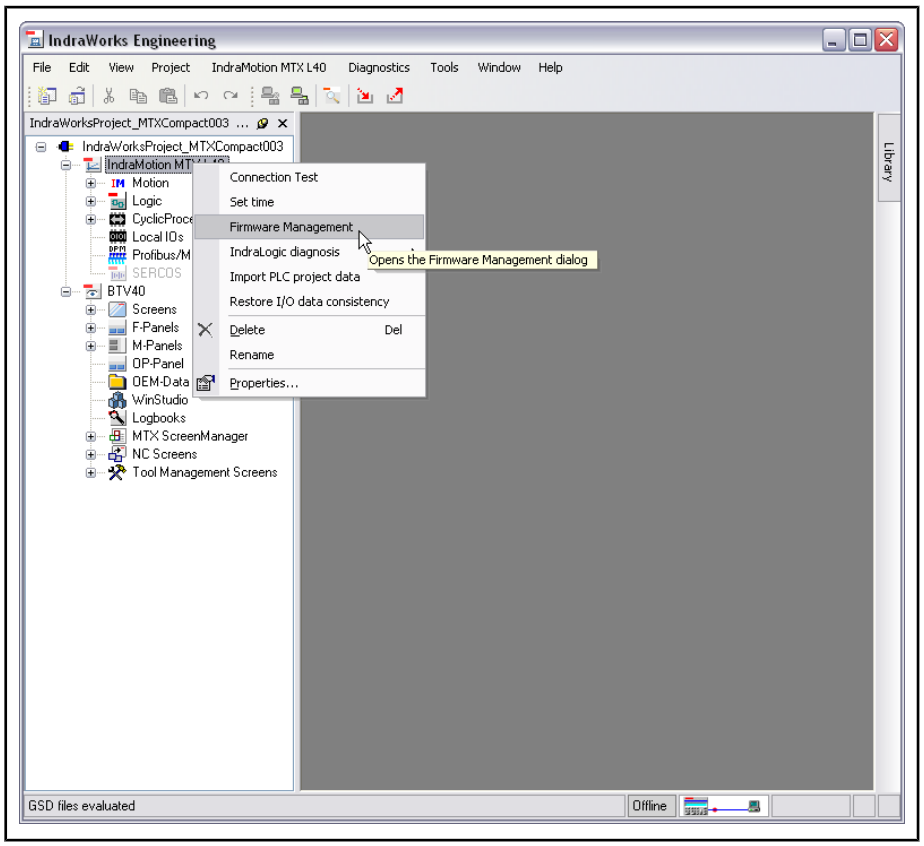

Fig.7-1: Calling the Firmware Download dialog

The device name and IP address of the device is displayed in the “Firmware Management” dialog. The stored versions of Firmware packages are listed in the selected Firmware directory in the left half of the dialog. The Firmware version of the selected device is displayed in the right half. With the following steps, a Firmware download is executed:

1. Bring PLC into STOP as no Firmware download is possible otherwise.
2. Select the directories with Firmware packages.
3. Select the desired Firmware packages because of the version designation.
4. Check the checkbox “Restart after download”. This checkbox is normally selected to boot the selected Firmware package after the Firmware download automatically.
5. The download is carried out by pressing the <Download> button.
6. A booting process must be triggered for activation of Firmware. This happens automatically when the checkbox “Restart after download” is selected.

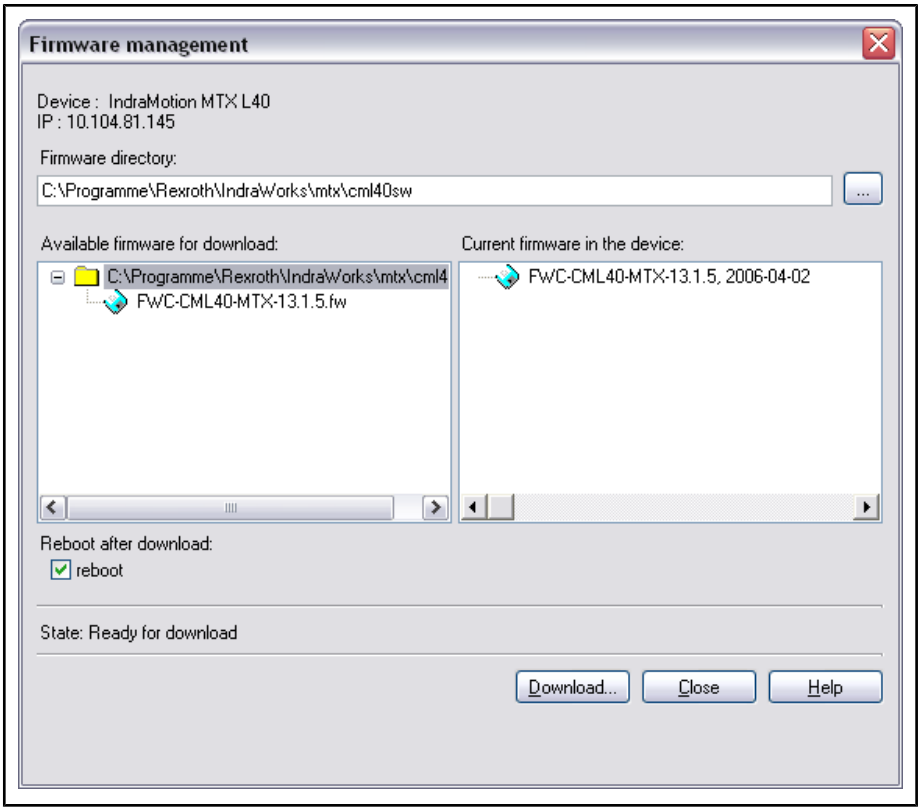

Fig.7-2: The Firmware Management dialog

The expiration of Firmware download is visualized by a progress bar after. The download can be cancelled (e.g. if the wrong Firmware package was selected by mistake). After cancellation, a new Firmware package should be loaded immediately to ensure that the Firmware is complete during the following boot procedure.

7.2 Handling Operator Panel/Status Display MTX Compact

The operator panel informs the user over the status of control IndraControl L40 during the boot process and during operation. Selected operations are additionally possible.

The boot procedure

During booting the IndraControl L40 the single phases will be shown on the display. The phases are subdivided in the following sections:

1. Starting the operating system: BOOT1.nn

   After Activating the CML40, the display remains dark for some seconds. Than the start of operating system is displayed by the increasing digits “nn”

2. Starting the Firmware loader: BOOT2.nn
3. Loading the Firmware Module: BOOT3.nn

   Loading the Firmware module is documented by displaying the module number “nn”.

4. Loading the control configuration: BOOT4.nn

   The FEPROM file system and the file “mtxtboot.ini” with the mount point definitions belongs to control configuration.

5. Booting the control Firmware: BOOT-Pnn

Boot phases of IndraControl L40 are defined uniquely in the control family IndraMotion MTX :

P: -3	Determines the existing hardware
P: -2	RTOS startup, configure file systems
P: -1	Start RTOS monitor
P: 1	Initialize basic NCS communication
P: 2	Initialize TCP/IP
P: 3	Initialize BAPAS database
P: 4	SERCOS initialization
P: 5	Start NCB-TCP server
P: 6	Start SERCOS startup
P: 7	Mount the NFS file systems
P: 8	Synchronization with SERCOS
P: 9	Enable NCB-TCP server (communication with user interface)
RUN	Normal operation

Fig.7-3: Display of startup phases

Boot lockout and specification of startup mode

The IndraControl L40 boots in the standard case with startup mode 0 (normal mode). If another startup mode should be specified, the boot process must first be prevented (boot lockout).

The boot lockout will be active if the <ESC> key was hold after loading the control configuration - i.e. on the end of phase “BOOT4.nn”. The IndraControl L40 expects now entering the startup mode.

The startup mode can be selected with the arrow keys. The selected startup mode can be discarded with <ESC> as the default value 0 is preselected. Via pressing the <Enter> key, the boot process is continued with the selected start-up mode.
The meaning of startup modi is described in the following table:

Startup mode	Meaning
0	**Normal operation** All existing data and file systems are retained. The root file system is checked during startup. If a defective file system is detected, a critical system error is displayed. A new (empty) root file system is automatically created during the next startup.
1	**PLC stop** The behavior corresponds to startup mode 0 with the difference that the PLC remains in the STOP state and the PLC user program is not processed.
2	**Reloading the PLC boot project** PLC boot project is loaded to the user FEPROM. Any PLC boot project that exists in the root file system is discarded. Otherwise, the behavior corresponds to startup mode 0.

Startup mode	Meaning
3	**Protected startup** In extreme cases, faulty machine parameter settings can make it impossible to start up a control. Startup mode 3 is used to carry out a startup in this situation, regardless of the set machine parameters. A startup with the minimum configuration occurs and the set machine parameters are ignored. After the startup, the invalid machine parameter settings can be corrected and a new startup with startup mode 0 can be carried out.
4	**Deleting the permanent CPL variables** The permanent CPL variables will be deleted, otherwise the behavior corresponds to startup mode 0.
5	**Cold start** The power-up management logic is not run; otherwise, the behavior corresponds to startup mode 0.
6	**Bootstrap** A new root file system is created; as a result, all the data of the old file system are lost. If an intact user FEPROM file system exists, the PLC boot project and configuration data are loaded from there.
7	**Creation of the user FEPROM file system** The user FEPROM is created; as a result, all the data of the old file system are lost. This is required, for example, if a user FEPROM file system is defective. The root file system remains. The permanent CPL variables will be deleted.
8	Identical to startup mode 9
9	**Debug Mode** This is the usual debugging mode if the control should not automatically start up after a reset. After the basic monitor is initialized, the boot loader is activated and the subsystems are loaded automatically.
10	**Debug mode (without automatic loading)** After the basic monitor is initialized, the boot loader is activated. Then loading can take place using TCP/IP.
11	**Debug mode (without activating the boot loader)** The basic monitor is initialized. Then loading can take place using TCP/IP.
12	Identical to startup mode 15
13	Identical to startup mode 15
14	Identical to startup mode 15
15	**Debug mode (basic monitor start)** Only the basic monitor is activated.

Fig.7-4: Startup mode

Display of PLC status (right half of display)

After complete startup of IndraControl L40, the current status of PLC is displayed in the right half of the display. The following can be displayed:

STOP	PLC is in STOP state. The PLC program was stopped. If this status is directly after startup of IndraControl L40, no boot project is active.
RUN	PLC is in RUN state. The loaded PLC program is executed.
BRK	PLC is on a break point. PLC program is interrupted because of the trouble-shooting.
SCYC	PLC works in single cycle mode. Every PLC cycle must be enabled manually.
ERR	PLC program was interrupted because of a runtime error.
???	PLC reports an unknown status. This display refers to a Firmware error and should never occur.

Fig.7-5: Operational states of PLC

Display of SERCOS phase (left display half)

After complete startup of IndraControl L40, the current status of SERCOS ring is displayed in the left display half. The following can be displayed:

P-1	The SERCOS loop is not closed, no drives have been recognized.
P0	It it tried to close the SERCOS loop.
P1	It is tried to identify all participants in the SERCOS loop
P2	The timing in SERCOS ring is determined and set.
P3	The drives were parameterized
P4	All SERCOS participants are ready for operation.

Fig.7-6: Displaying the SERCOS phases

Error Displays

Severe errors were output on the display during operation. This errors can only be eliminated by a reboot. If necessary, a suitable startup mode must be selected previously.

SF	A critical system fault has occurred
BP	A boot panic error has occurred
SD	Shutdown active

Fig.7-7: Error status display

The errors will be specified in more detail by a four-digit number. They are described in detail in the document "Diagnosis messages".

Reboot

Pressing the key <ESC> and <↑> for approx. 8 seconds can trigger a reboot.

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Notes

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