S7-USB user manual

Art.Nr. 9352-S7-USB

documentation of version XXX

1 Description

The MPI-USB cable connects the computer via USB with a MPI interface (9 pin interface of the PLC).

2 System requirements

2.1 Operating system (s)

Windows 98 + SE Windows ME/NT/2000 Windows XP Windows Vista Windows 7

2.2 Software

PLC - programming software (eg PG2000, Step © 7, S7 for Windows, Microwin) Direct driver for Simatic-Manager for USB PLC - VCOM Software A video description of the installation of direct-driver and how to configure it can be found on the page support!

2.3 Hardware

USB 1.1 - Type A

2.4 Provided PLCs

S7-200 S7-300 (provides baudrates up to 12M (when the PLC is able to support this) S7-400 (provides baudrates up to 12M) FM-devices Sinamix (Step7-direct-driver up V1.20 or PLCVCom up V2.71) MicroMaster and other electrical drives and inverter-feds (Step7-direct-driver up V1.20 or PLCVCom up

V2.71) Sinumerik (only PLC-side) SEW-EURODRIVE power inverter and at last routing of S7-PLCs

3 Connecting options

S7-USB directly connected to the PC.
S7-USB is connected to the PC via a USB hub.
S7-USB Connection options with control terminal

4 Installation

4.1 Hardware

The S7/MPI-USB is plugged directly into the PLC. Via the USB cable of the module can be connected to the PLC as follows:

Normal installation (for programming)
The MPI cable will be connected to the S7 PLC via the 9 pin connector (short side of the cable). The USB connector on the long side of the cable will be connected with the computer.

S7/MPI-USB as HMI (Human Machine Interface) – adapter
The HMI – function provides the possibility to connect a operator panel (which has instead of a MPI interface a USB device and understands the HMI protocol) with a S7 PLC (300/400). Connect the cable between the terminal and the PLC. The HMI – protocol must be part of the operator panel.

There must be a serial communication with the operator panel if this op is new/used at the first time. Therefore connect your operator panel with the serial COM interface of your computer. After the communication has been running successfully the panel is ready to be connected to the PLC.

4.2 Software

To communicate with the PLC, please install following products for MPI-USB, S7-USB, MPI-II[only USB], MPI-LAN and S7-LAN:

Product	Driver
TIA-Portal	TIC ⇒ "TIC ETH/USB" for MPI, PPI or PROFIBUS configuration of driver with control-panel ⇒ setting PD/PC-interface
Simatic-Manager	TIC ⇒ "TIC ETH/USB" for MPI, PPI or PROFIBUS
Starter-Software	TIC ⇒ "TIC ETH/USB" for MPI or PROFIBUS
MicroWin	TIC ⇒ "TIC ETH/USB" for PPI and S7-22x-PLC
MicroWin	PLCVCom for S7-21x-PLC (no MultiMaster-protocol)
PG-2000	PLCVCom or for S7-LAN/MPI-LAN direct in interface-settings
S7 for Windows	TIC ⇒ "TIC ETH/USB" for MPI or PROFIBUS over PD/PC-interface
S7 for Windows	PLCVCom

To communicate with the PLC, please install following products for MPI/PPI and MPI-II[only serial]:

Product	Driver
TIA-Portal	no support because Siemens has taken out the serial support in the driver "PC-Adapter"

Product	Driver
Simatic-Manager	included driver "PC-Adapter" for MPI and PROFIBUS
Starter-Software	included driver "PC-Adapter" for MPI and PROFIBUS
MicroWin	included driver "PC/PPI-cable"
PG-2000	Standard-function, configuration in the interface-settings
S7 for Windows	Standard-function, configuration in the interface-settings

4.3 USB-driver-installation for 32-bit-systems

The S7-Interface S7-USB, MPI-USB or MPI-II-Cabel over USB as well as the devices of TeleService-family will be connected to USB 1.1-compatible port of the PC.
This opens the Hardware-Installation-Wizard:

We don´t need a connection to Windows update.
Select now "Install from a list or specific location":

Enter as source the folder "..\USB-Treiber-x86". Either in the folder where the downloaded drivers were extracted or the directory on the product CD:
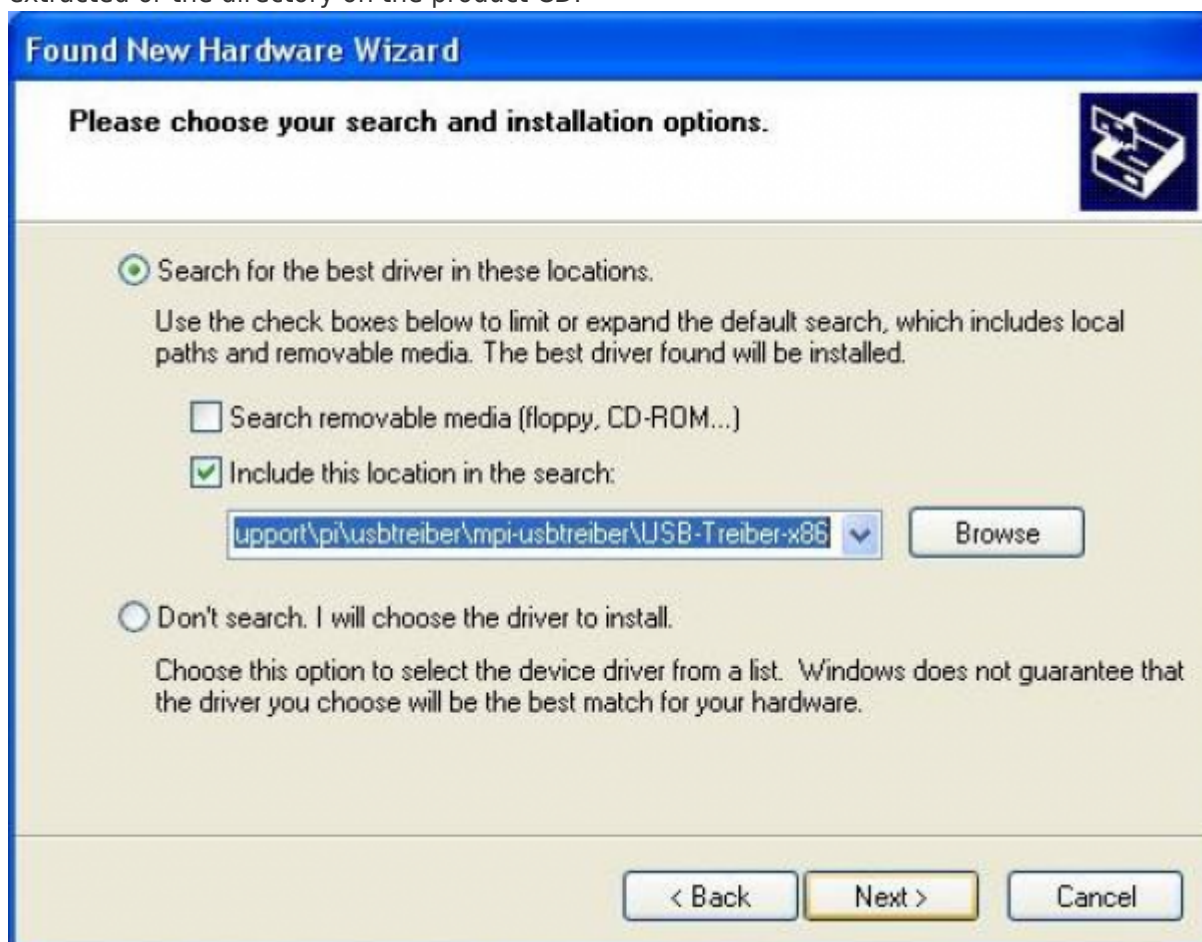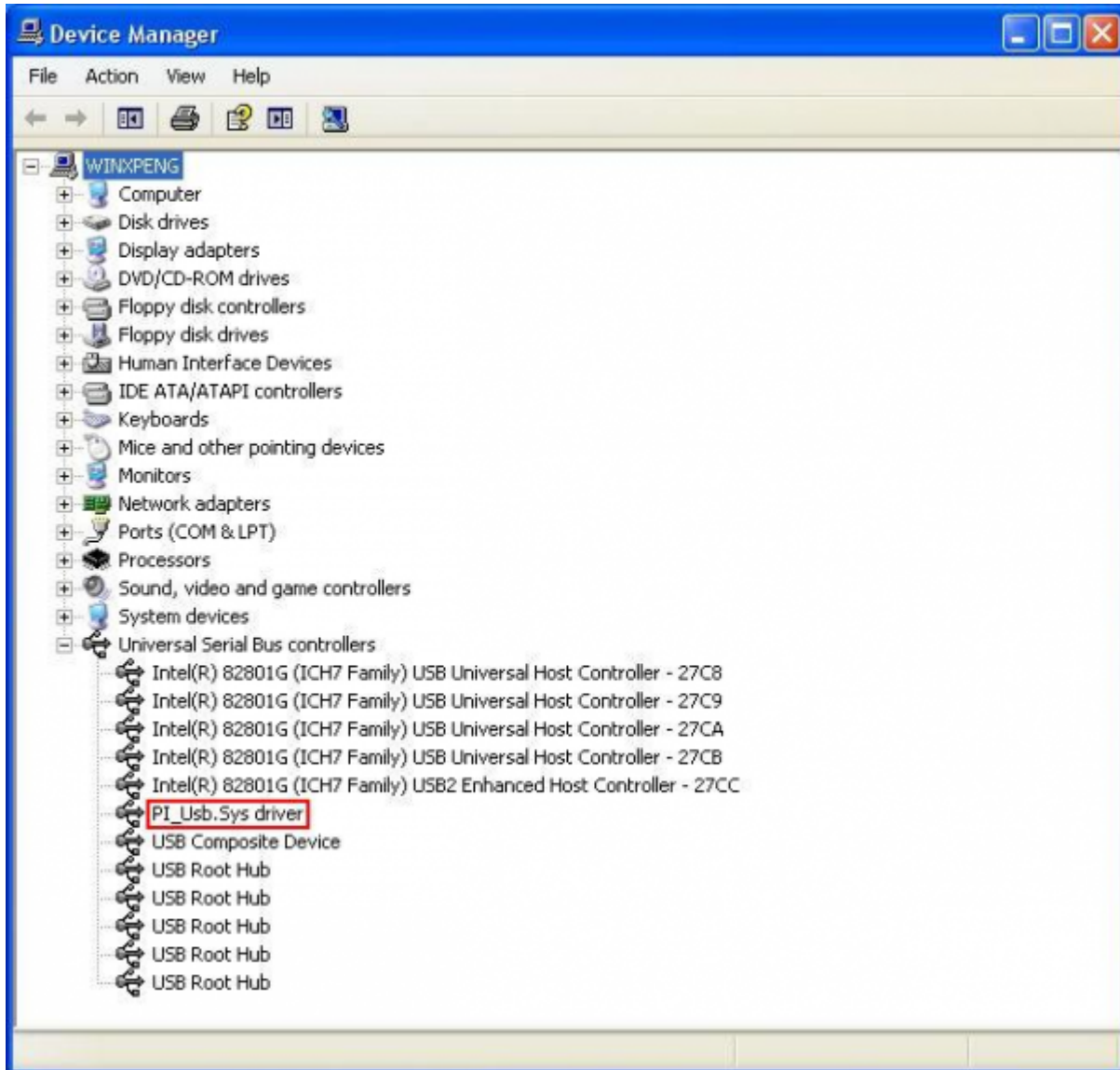
The message of windows logo test skip with "Continue Anyway":

After copying the data appears a little moment later the success message:

Upon a successful installation the "PI_Usb.Sys driver" will be displayed without any warnings in the device manager:

Will this entry in the device manager shown with a "yellow exclamation mark", then please install the driver again or look in the driver properties about the reason.

If the driver has to be updated, please use the function "Update …" in the driver properties:

If the driver has to be deleted, please use the function "Uninstall" in the driver properties:

If you install older versions of PLCVCom, Step7-direct-driver or S7IFC, the actual usb-driver will be possible overwritten by previous versions because it was included until 01/11/2012 in their install-shields!

4.4 USB-driver-installation for Win7 64-bit

The S7-Interface S7-USB, MPI-USB or MPI-II-Cabel over USB as well as the devices of TeleService-family will be connected to USB 1.1-compatible port of the PC.
After the first plug of the device Win7 displays the message „Installing device driver software" and after some time „Device driver software was not installed". This messages could be closed.
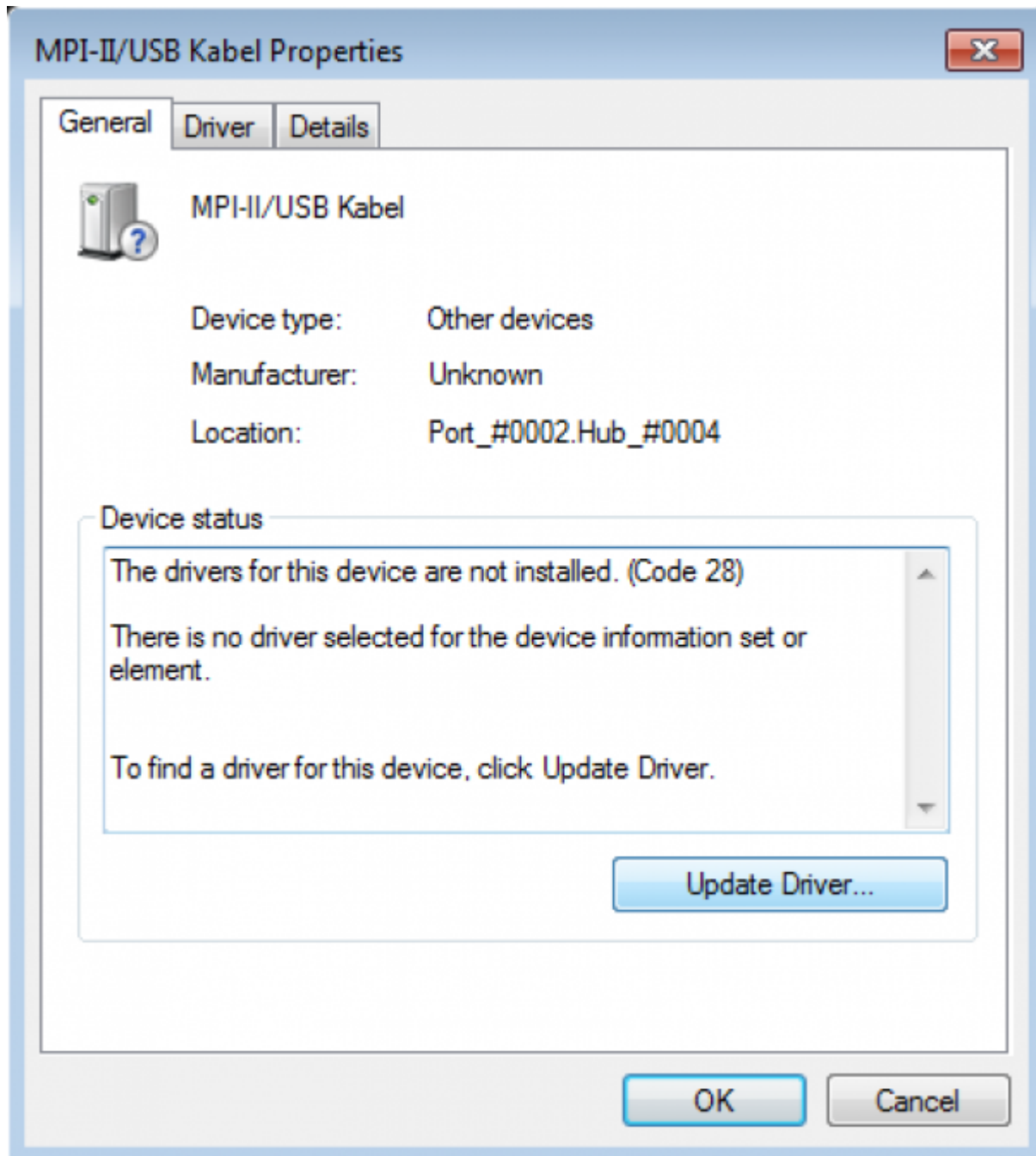Please start the windows device manager in the control panel.
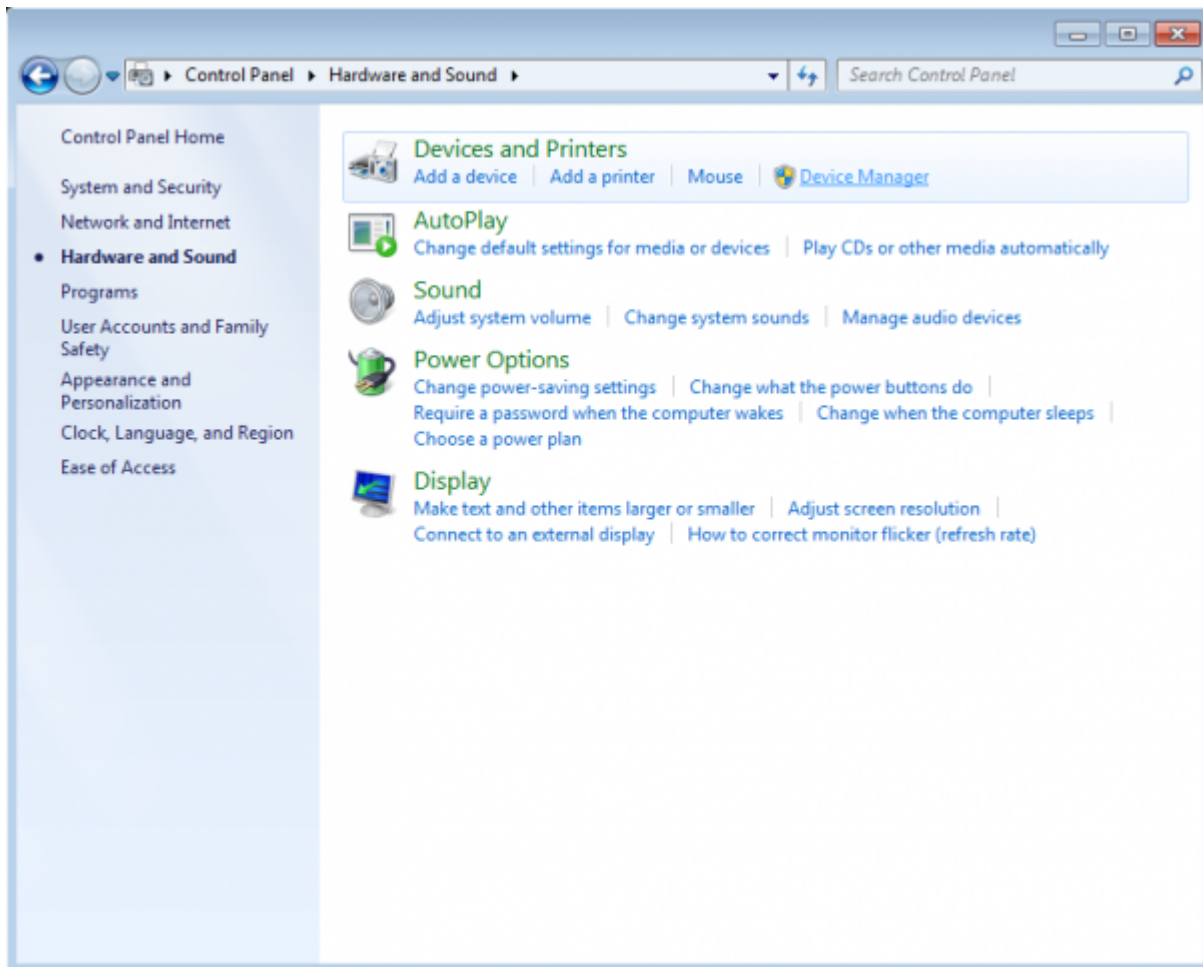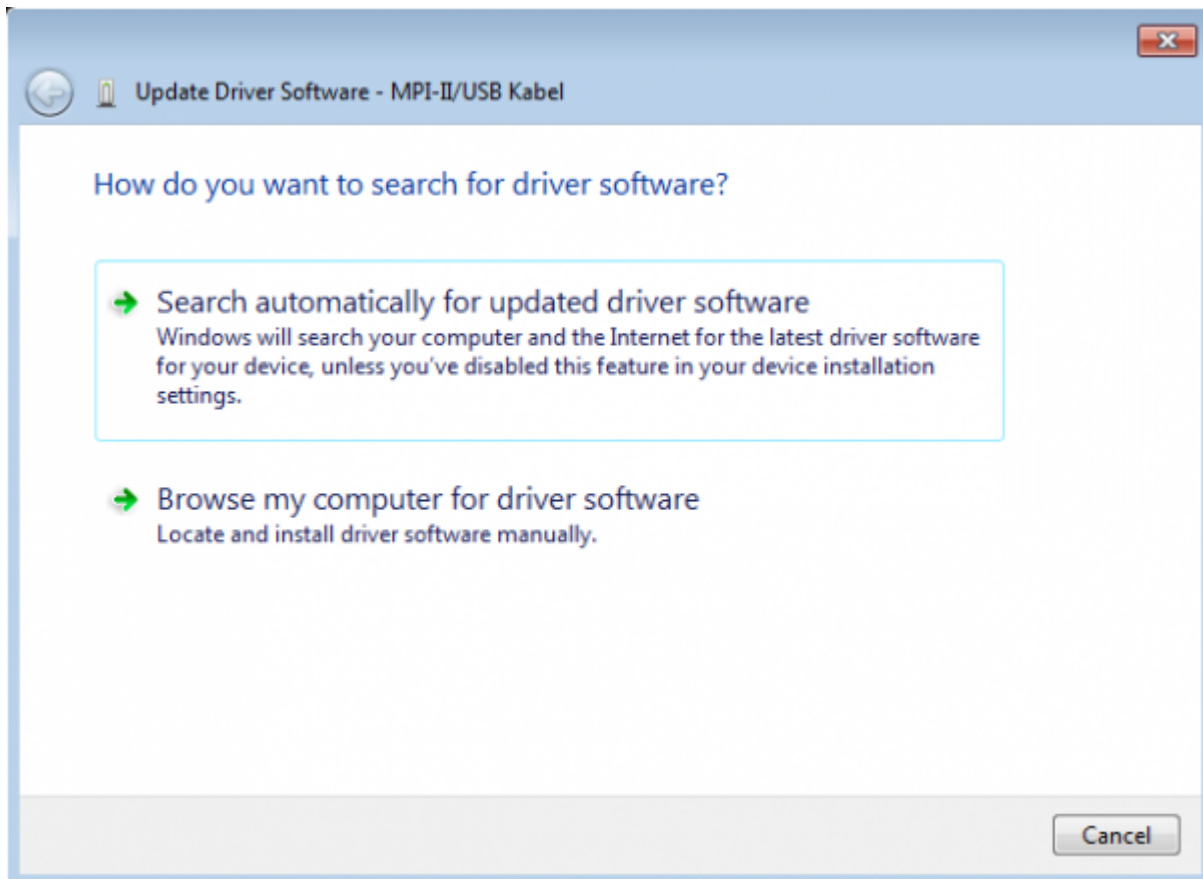
In the device manager would be the new device shown with a exclamation mark:
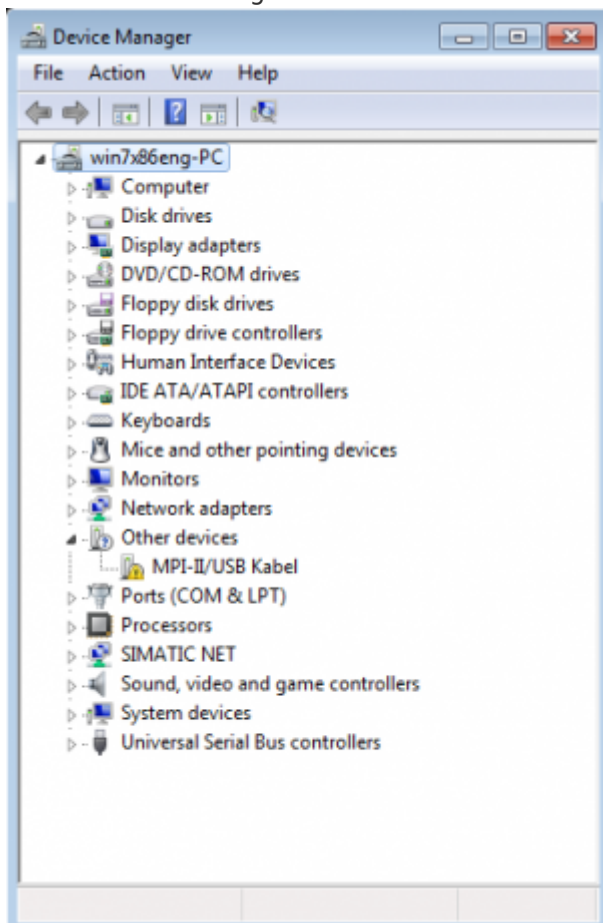
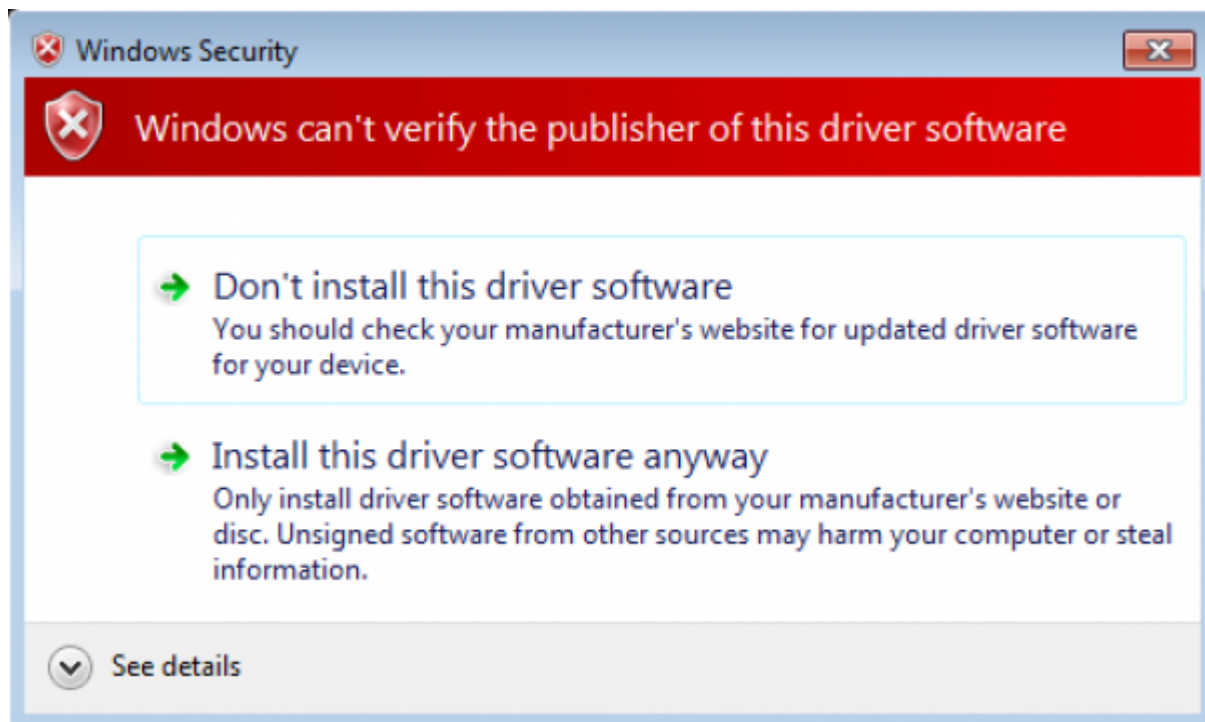With a right mouse-button-click you will open the properties of the new device:
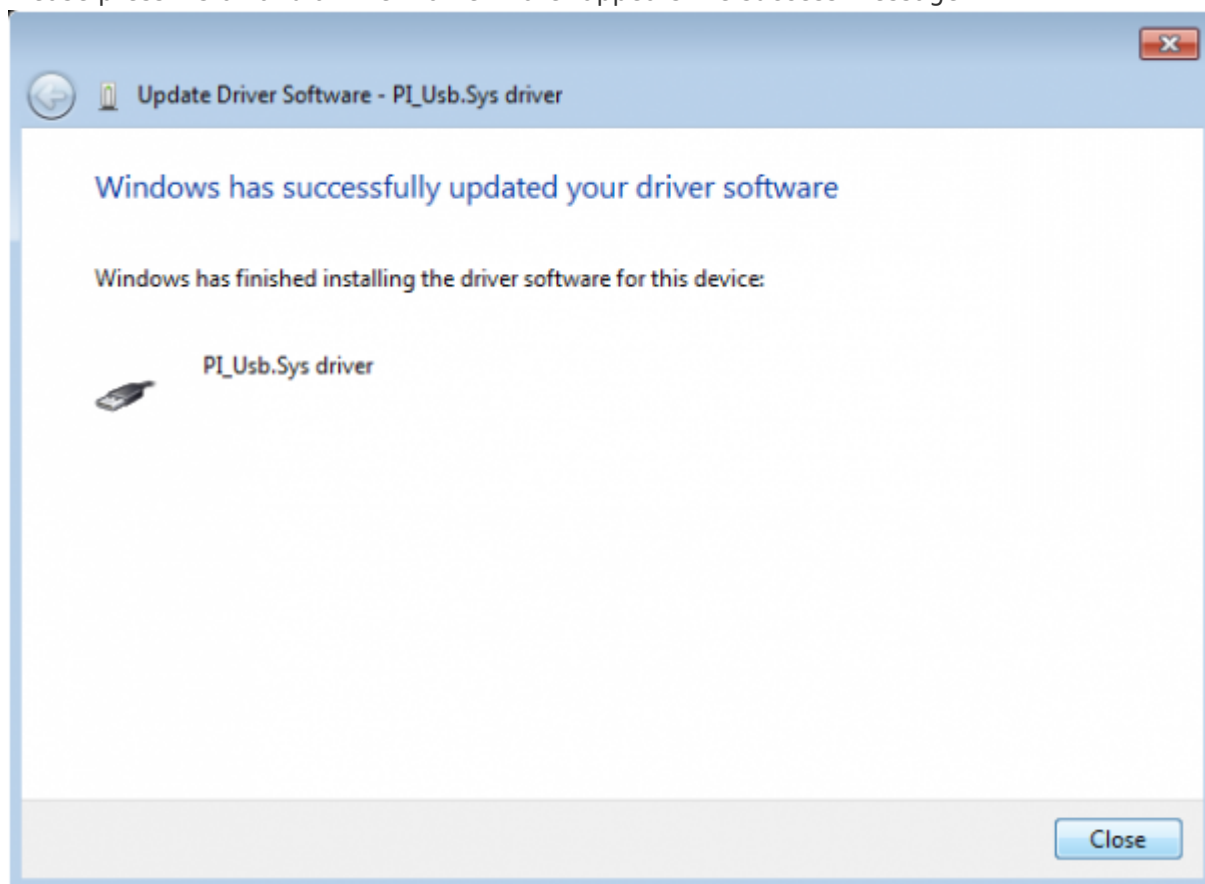
Now select "Update Driver…":

Please select "Browse my computer for driver software" and define as source the folder "..\USB-Treiber-x64". Either in the folder where the downloaded drivers were extracted or the directory on the product CD:
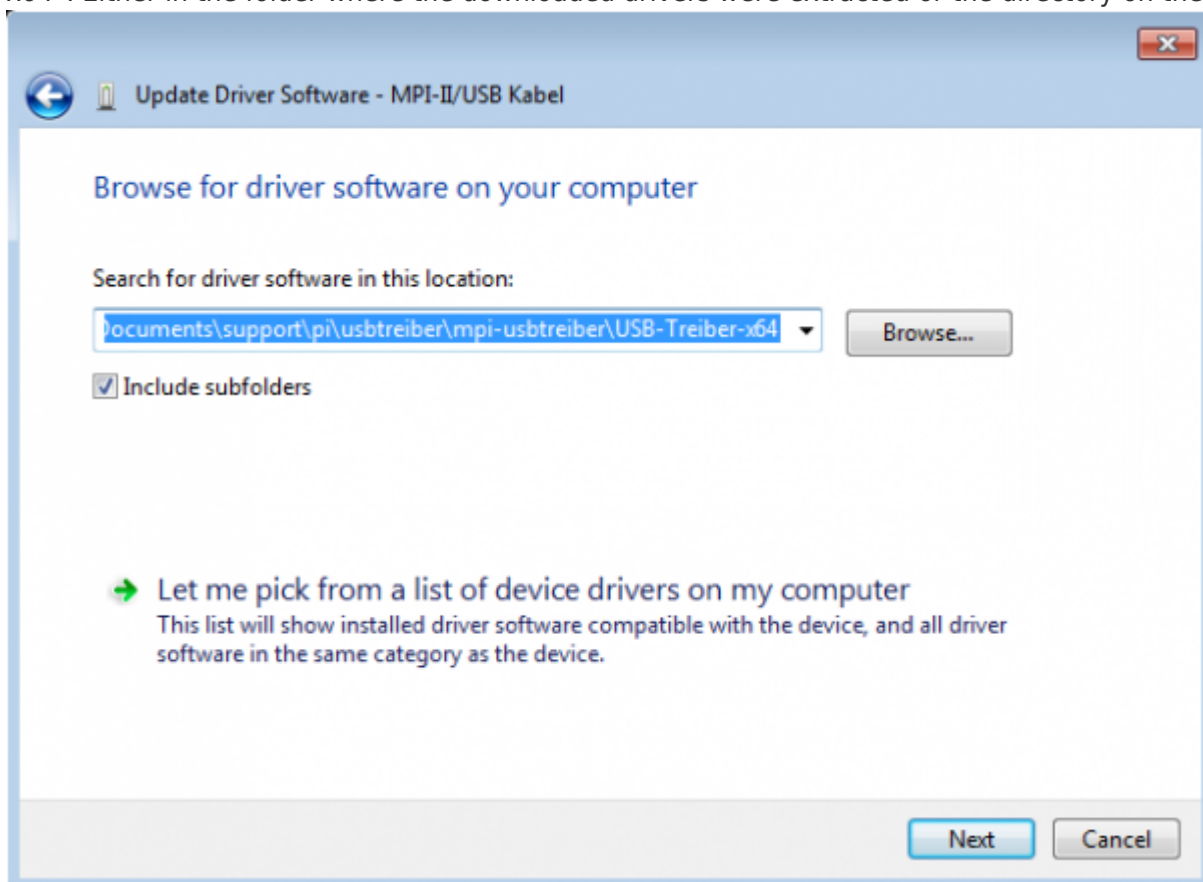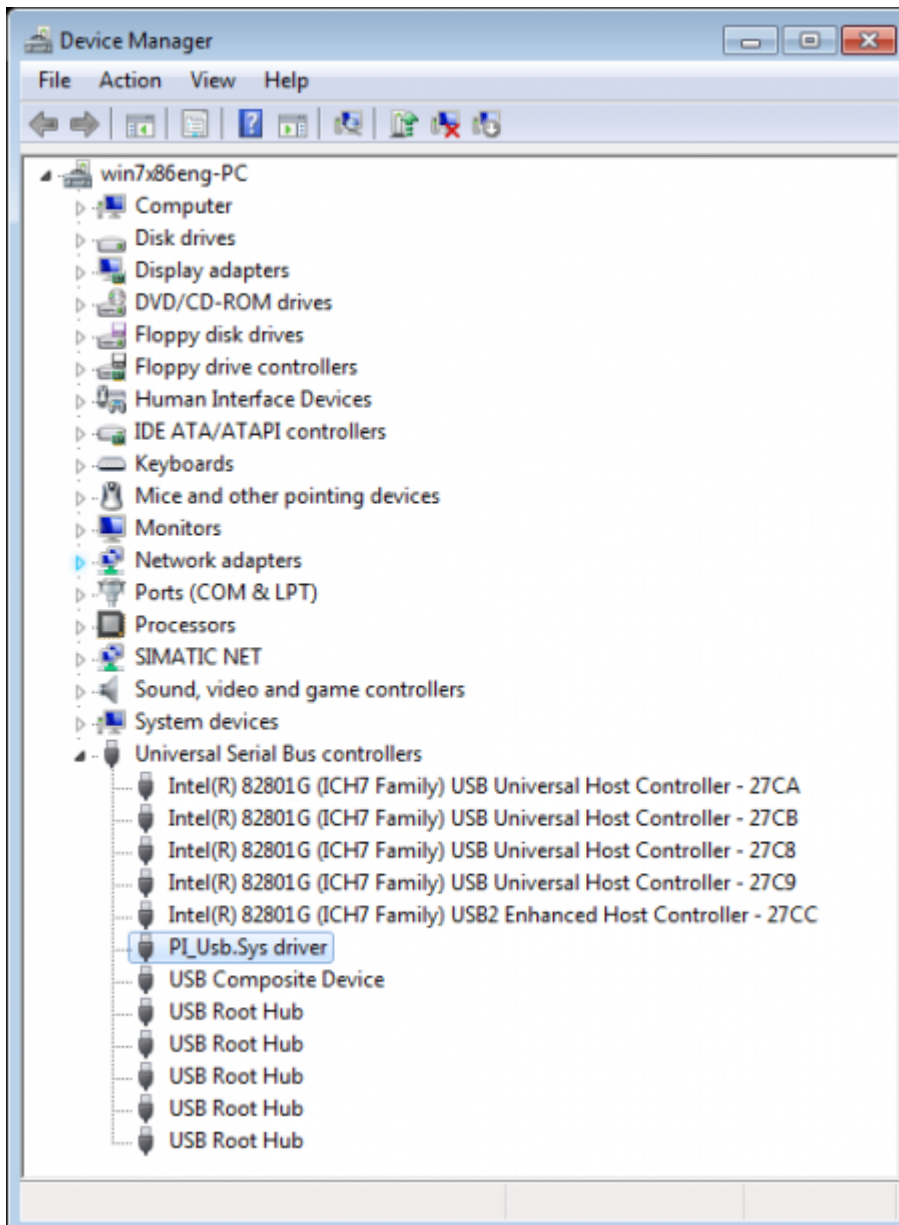

After pressing "Next" the message appears of windows UAC

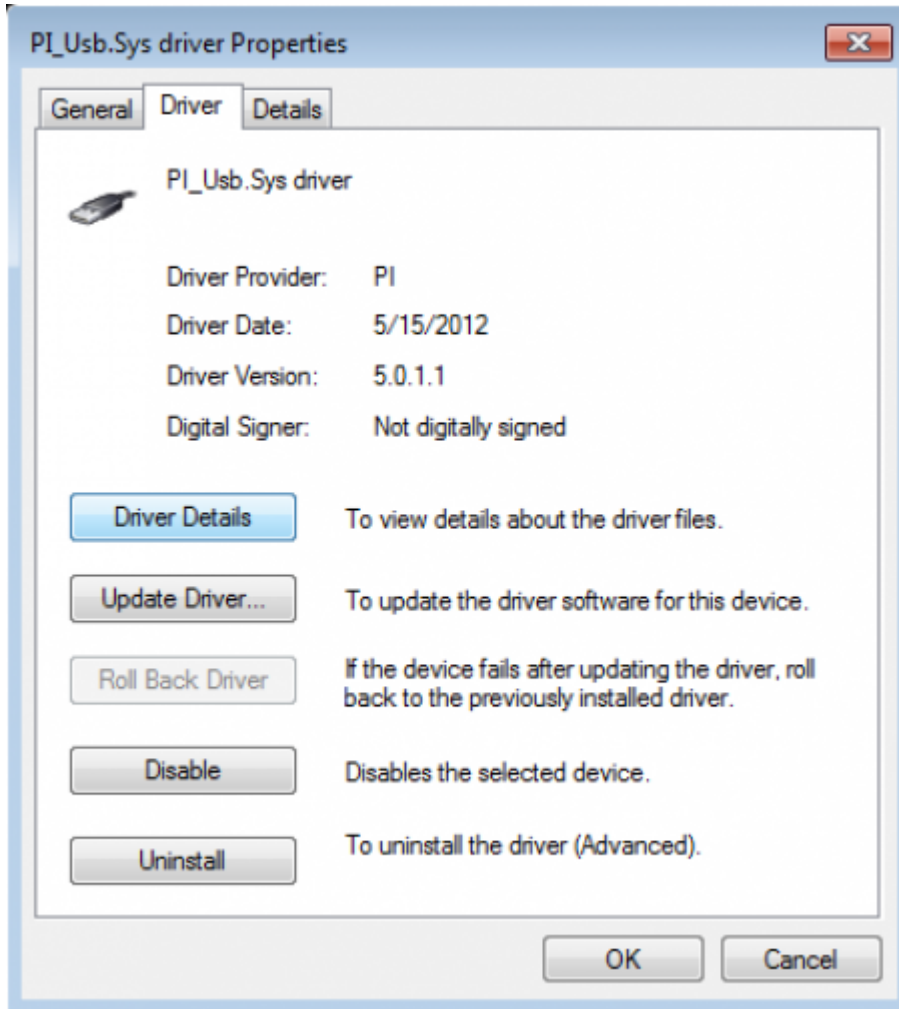Please press install and a little moment later appears the success message

To verify the successful installation, you can look again in the device manager:

Here may appear no exclamation mark!

If the driver has to be updated, please use the function "Update driver ..." in the driver properties:

If the driver has to be deleted, please use the function "Uninstall" and set the check-box in "Delete the driver software for this device":

If you install older versions of PLCVCom, Step7-direct-driver or S7IFC, the actual usb-driver will be possible overwritten by previous versions because it was included until 01/11/2012 in their install-shields!

5 Control elements

5.1 Lateral LEDs

Green LED OFF	Power OFF (S7-USB is not supplied with voltage)
Green LED is blinking	BUS Communication
Green LED is on	Power ON (S7-USB is supplied with voltage)
Yellow LED is OFF	no error in the communication
Yellow LED is blinking	1x Module does not come into bus 2x Participants provided with the same MPI address 3x Wrong MPI baud rate is used 4x Detected parity error on the bus 5x Buffer overflow condition in module

6 Implementing

Connect your module as described in the chapter " Hardware installation " to the PLC and to the programming device or to your computer.

If you want to respond to a PLC via the module you have to comply the requirements as described in the chapter "system requirements" . In addition,please make sure that the module is properly connected

6.1 Using the PLC-VCOM

(The PLC-VCOM is only needed if your module is not connected via the 9 pin COM port to the computer. For products with USB, Ethernet connection, etc., the PLC-VCOM is required)

1. Start the PLC - VCOM application (If it has not already started yet).

2. Click in the main window of the PLC-VCOM, in the status area "configure". The configuration wizard will start.

3. It lists all the found modules / cables and the additional information's such as IP address and MAC address of the module.

4. Choose the desired MPI cable and click „OK" to go on.

5. If the connection is established the chosen cable is shown in the section state and on the left side you can see the status connected.

6. It also displays, the PLC-VCOM the IP address for the module and the IP address of the computer which is connected to the module.

If you have any problems with the use of PLC-VCOM software, go to the chapter PLC – VCOM and look there for operating instructions.

6.2 Programming software to use with direct access

After you have adjusted and connected the PLC-VCOM or the programming adapter to the COM-port on your computer, you will be able to connect with your programming software
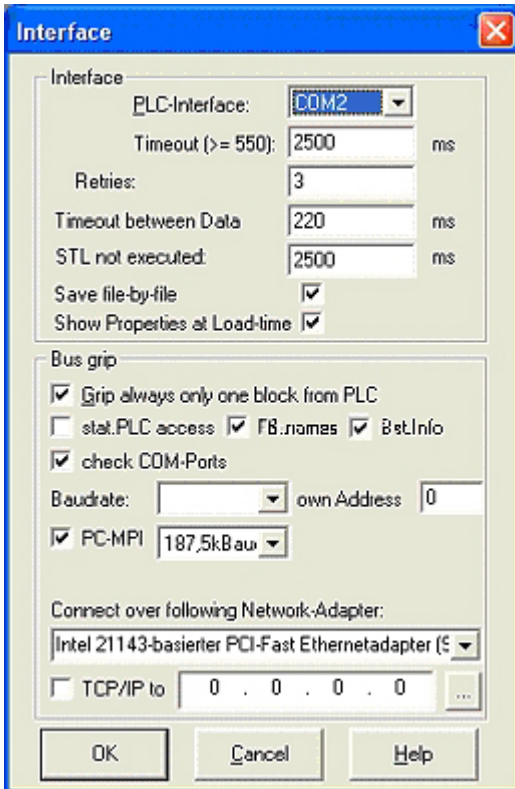to the PLC and work with it.

How you have to adjust your programming software is described in the following points:

6.2.1 PG2000 für S7 (V5.10)

1. Start the PG 2000 software by using the desktop link or by using the application entry in the start menu.
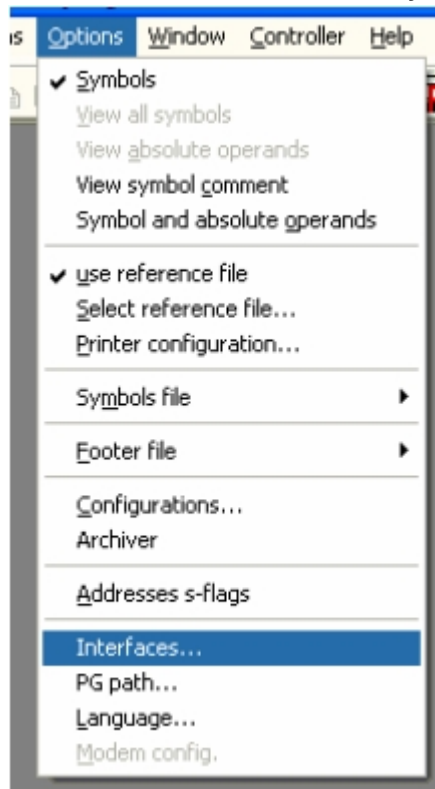
2. Choose from "View" ⇒ "S7-300/400" In the menu "Options" click "Interfaces"..

3. A dialog appears, in which you are able to set the "AG-Interface" (COM-port) in the section "Interfaces".

4. Configure the baud rate in the section "Bus access" to "19,2k". Below change the value for PC - MPI to "187,5kBaud".

5. Save your configuration by pressing "OK".

6. Now the software is ready to establish a connection to the PLC Click the symbol "Open" and afterwards press "PLC". Alternative you can click:

„File" ⇒ „Open" ⇒ „PLC"

The connection between PG 2000 and the PLC is now established. A new window appears. Now you can edit the blocks in the PLC.

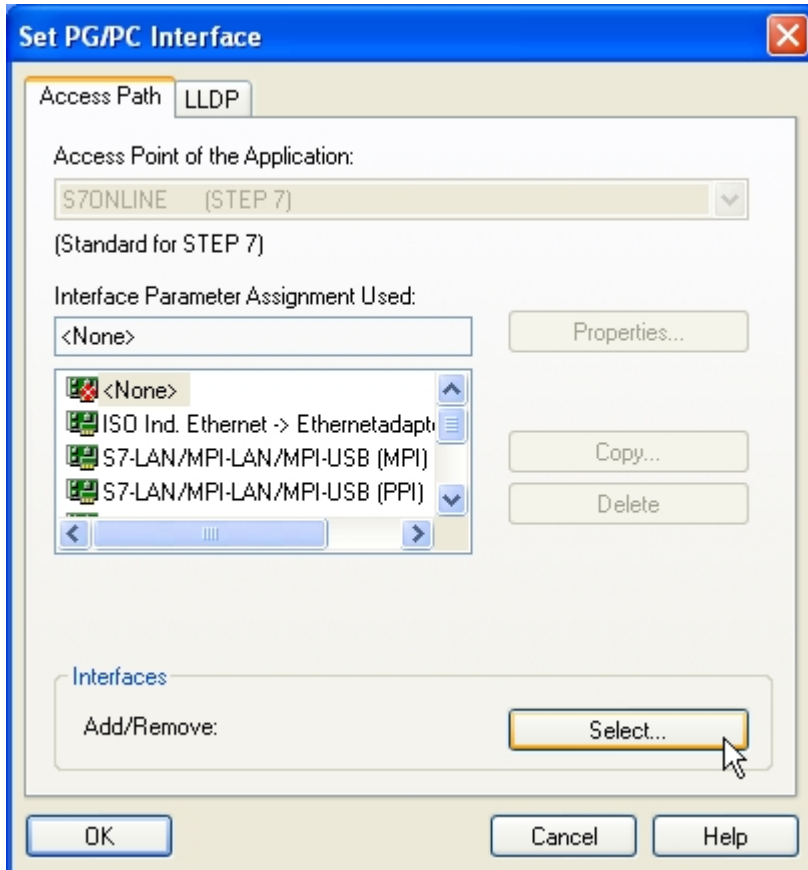# 6.2.2 PSet PG/PC interface

This step is required for the following software:
⇒ SIMATIC Step© 7 Manager (v5.2 + SP1)
⇒ Windows Control Center (WinCC) (v6.0)
⇒ Windows Control Center flexible 2004 (WinCC flexible) (v5.2.0.0)
⇒ ProTool/Pro (v6.0 + SP2)
⇒ Microwin 3.2

1. Open the system configuration by using the start menu. 2. Click on „Set PG/PC interface".

3. A Dialog with a list box named "Interface Parameter Assignment Used:" appears. This box should offer some "PC - Adapter" entries If this is the case, please continue with the step MPI settings or Profibus settings. If you can't find these entries go ahead with step PC-Adapter orTCP/IP installation.

6.2.2.1 PC-Adapter(Auto, MPI, PROFIBUS)

4. Click on „Choose" to add these entries to the PG/PC interface configuration
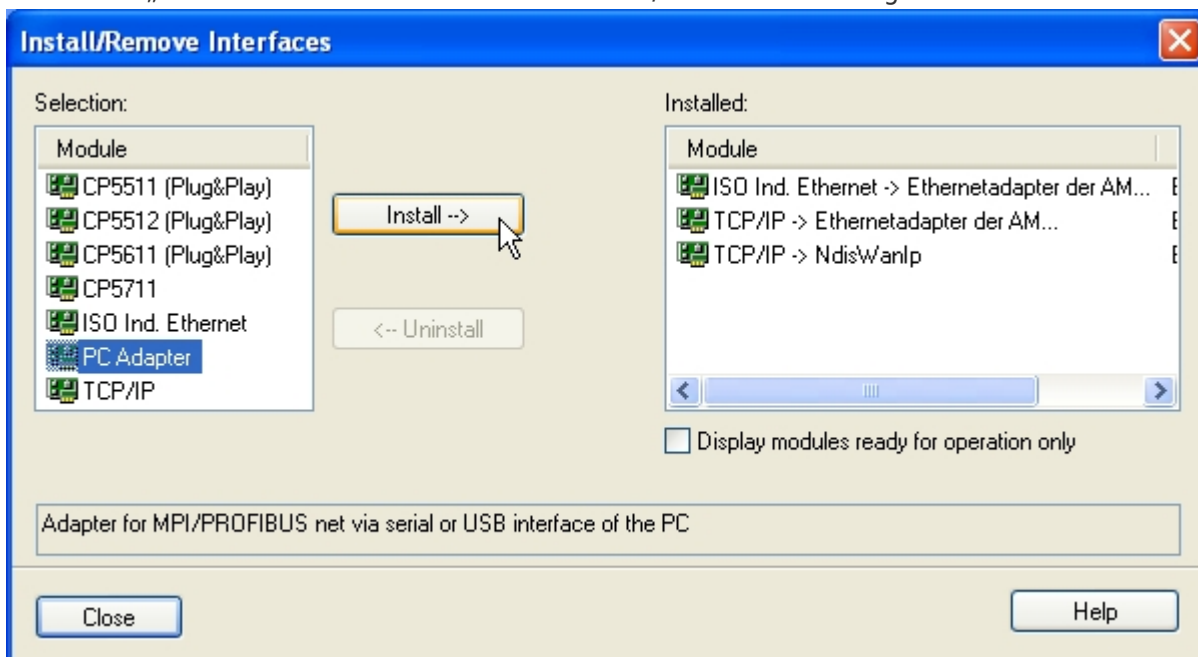
5. In this dialog you can deinstall every installed construction set Furthermore you can add various modules (see "Selection") Choose „PC - Adapter" from the „Selection" box on the left side and click on „Install".

6. The chosen construction set will be installed and a question appears which asks you to use the "MPI"

access for the PLC used. Click "Yes" if you want to use the „MPI"communication type. Otherwise click "No"(e.g. if you want to use the "PROFIBUS" communication type).
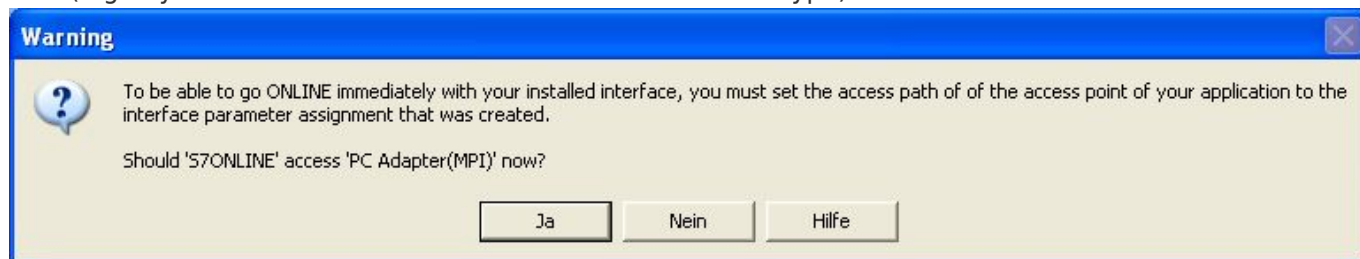
6.2.2.2 TCP/IP RFC1006 Communication
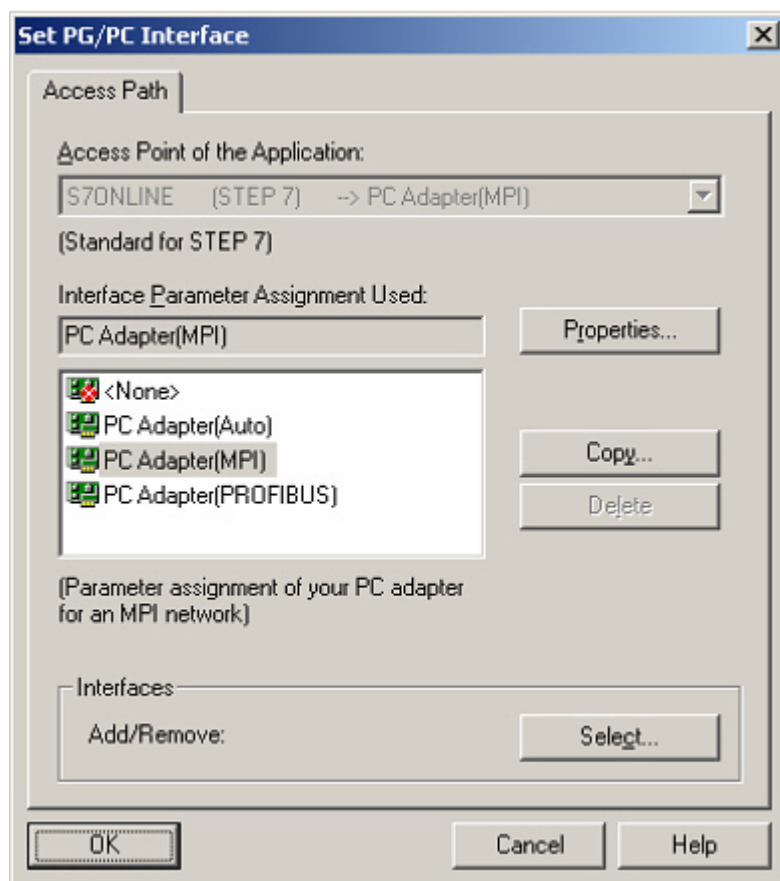
7. Press "Select" to add the RFC1006 required elements to the PG / PC - interface configuration.

8. In the dialog "Select", choose" TCP / IP" and click on "Install".

9. After successful installation, click "Close".

10. Back to the "Set PG/PC interface" dialog you will now find the desired entries called "PC - Adapter(Auto)" (not supported), "PC - Adapter(MPI)" and "PC - Adapter(PROFIBUS)". Now you are able to configure the bus. If you want to use the "MPI"communication type go ahead with step MPI setting . The settings for "PROFIBUS" is explained in Profibus setting .

6.2.2.3 MPI setting
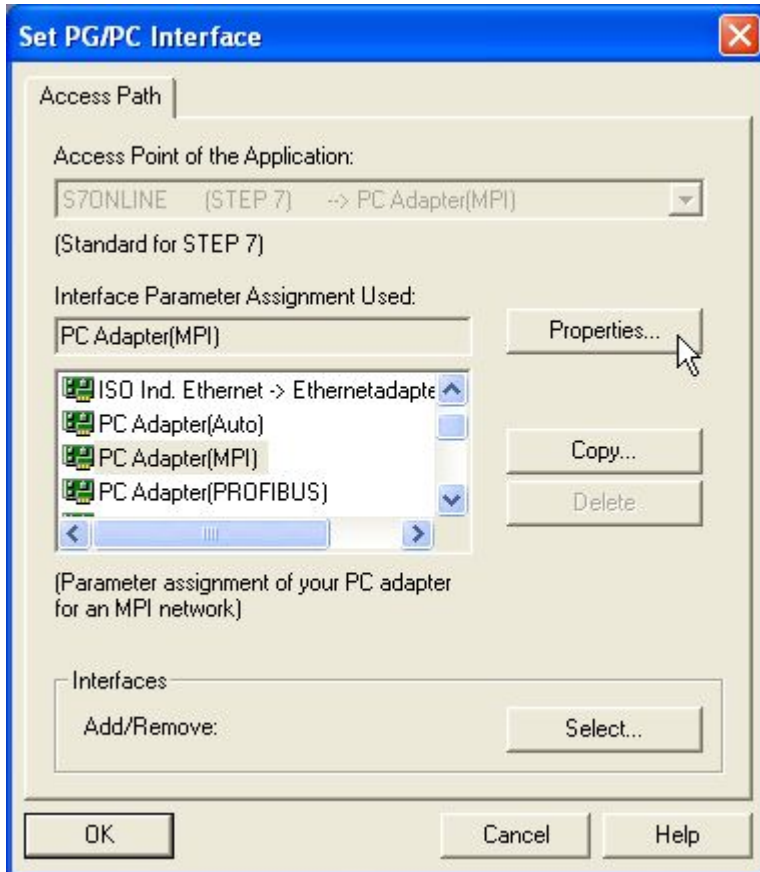
11. Select "PC Adapter (MPI)" and click "Properties".

12. Open the properties dialog Choose the register "Local Connection"
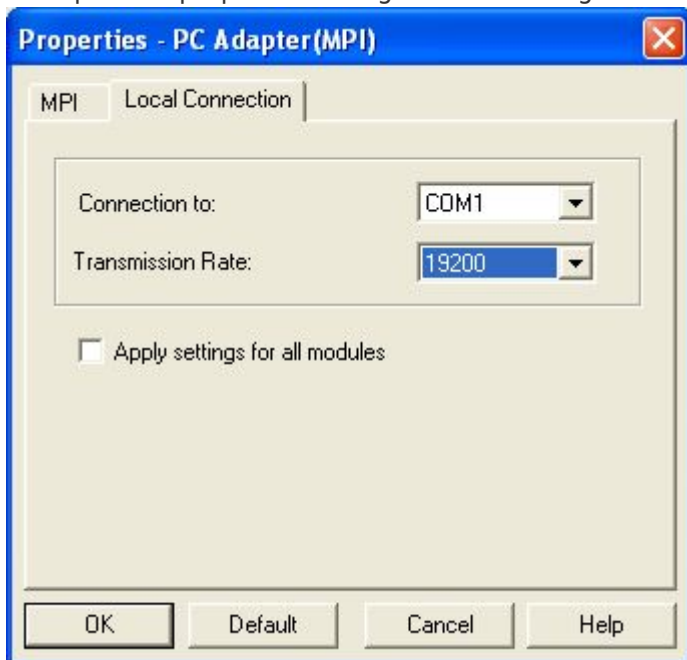
13. Set here the COM port.

14. You also change the "transfer rate" to "19200".
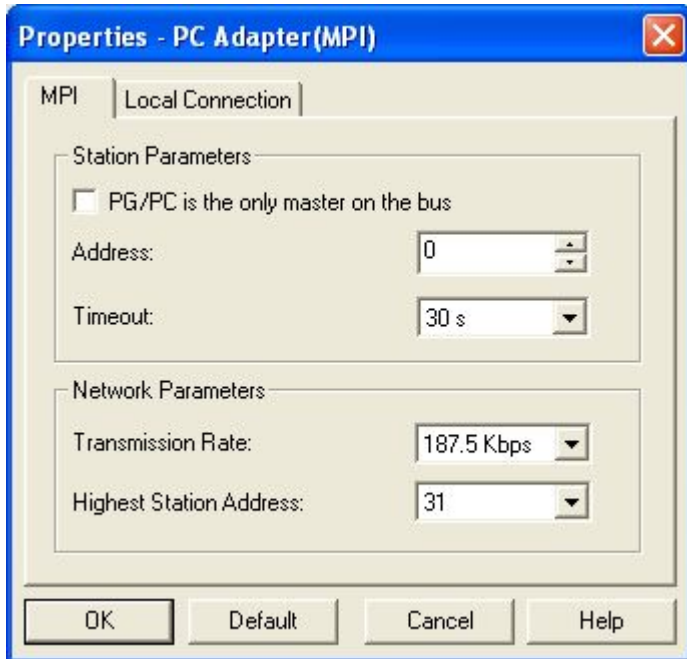
15. In the register card "MPI"choose the "Transmission Rate" to "187,5 kbit/s". Change the "Highest Station Address" (HSA) to "126".

16. Accept your settings with "OK" and exit the "PG / PC interface setting" dialog with "OK".

6.2.2.4 Profibus setting
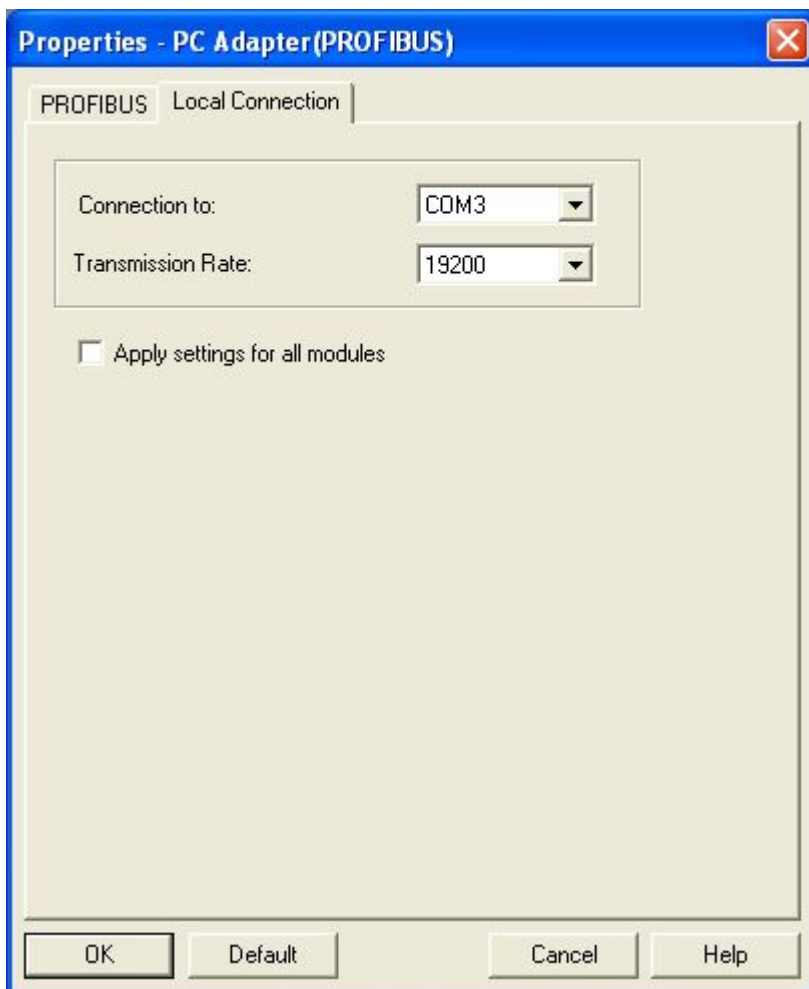
17. Mark the entry „PC - Adapter(PROFIBUS)" and click on „Properties".
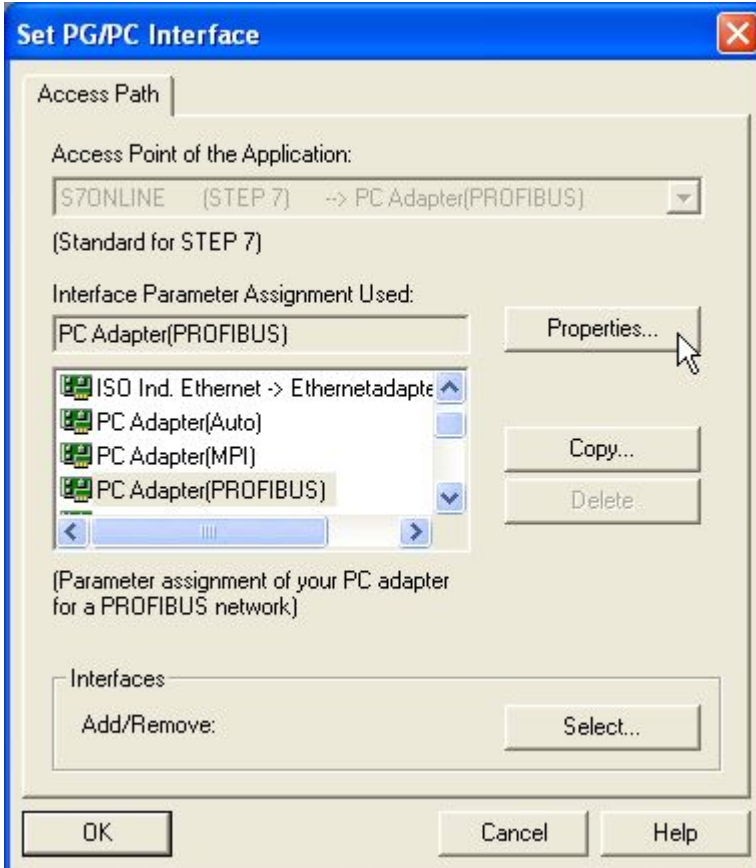
18. In the registry card "Locale connection" you have to set the COM Port. 19. Set the "Transmission Rate"
to "19200"
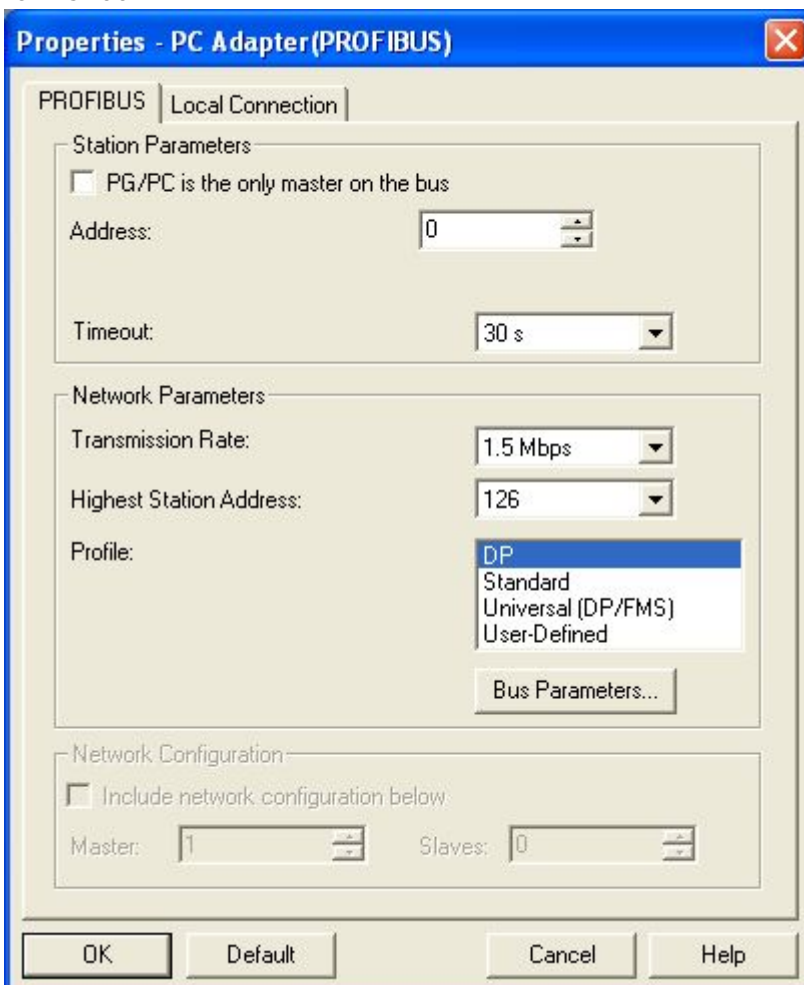
20. Choose the registry card "PROFIBUS" and set the "Transmission Rate" to "187,5kbit/s".

21. Set the "Profile" to "DP" ("decentralized Peripherals ").

22. Save your settings by clicking the "OK"button and close the opened "Set PG/PC - interface"dialog

6.2.2.5 TCP/IP RFC1006 setting

23. For this kind of communication you only have to install the corresponding software.

6.2.2.6 ProTool/Pro RunTime (RT) Configuration
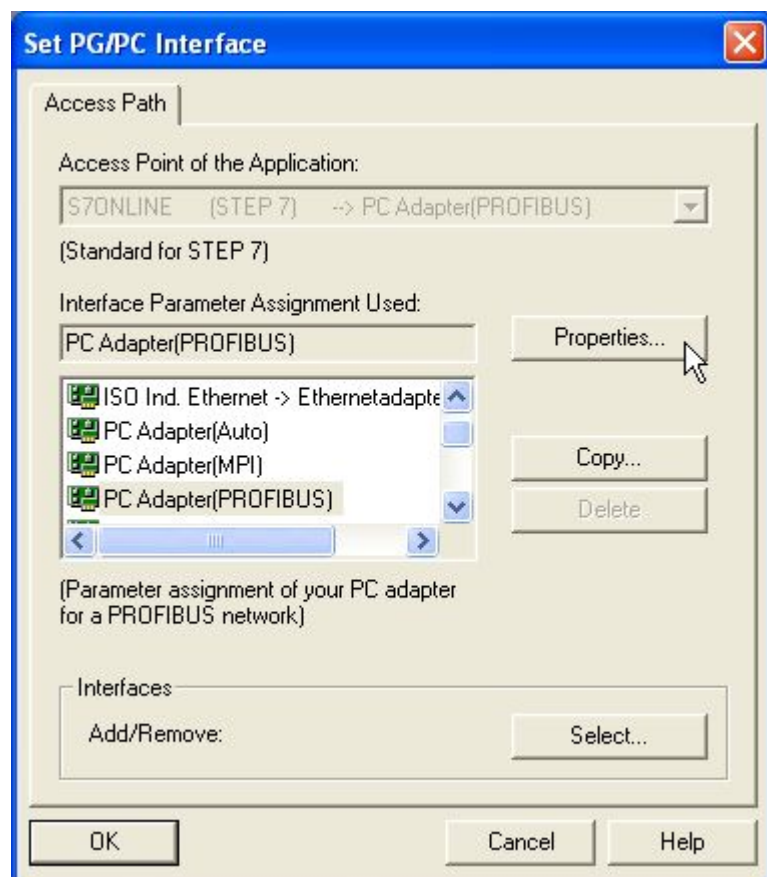
24. If you want to use ProTool/Pro RunTime you can set the "PG/PC Interface" by selecting the entry "DPSONLINE". Therefore you have to select "Access Point of Application" and configure it as described above. The easiest way is to use the S7-LAN/MPI-LAN/MPI-USB- driver which supports USB and LAN products.

The interface configuration for these programs is finished.

Continue with the software which you want to use:

⇒ SIMATIC Step© 7 Manager (v5.2 + SP1)

⇒ Windows Control Center (WinCC) (v6.0)

⇒ Windows Control Center flexible 2004 (WinCC flexible) (v5.2.0.0)

⇒ ProTool/Pro (v6.0 + SP2)

⇒ Microwin 3.2

6.2.3 SIMATIC Step© 7 Manager (v5.2 + SP1)

Configure the interface as described in Set PD/PC-Interface.

To use one of the other options please go ahead and read in the manual of WinCC software.

5. Please wait until the project is created. The project content will be shown in the left part of the main window.

WinCCExplorer - H:\PROGRAMME\SIEMENS

File   Edit   View   Tools   Help

- Projekt
  - Computer
  - Tag Management
    - Internal tags
    - SIMATIC S7 PROTOCOL SUITE
      - MPI   New Driver Connection...
      - PRO
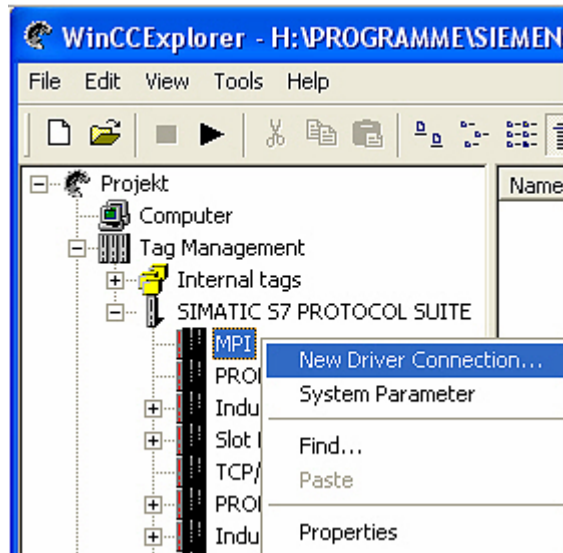   - Indu   System Parameter
      - Slot
      - TCP/   Find...
      - PRO   Paste
      - Indu   Properties

tem" on "Display Accessible Nodes".

evices, a communication over the cable has taken place.

so the conditions if it is an "active" or "passive" assembly.

y with his blocks.
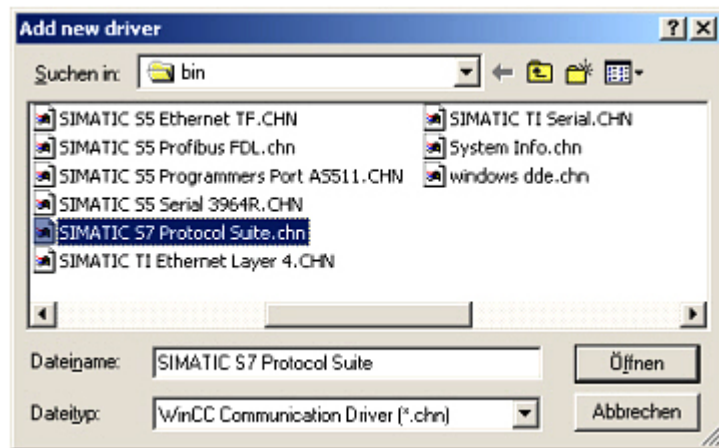
Center (WinCC) (v6.0)

6. For a proper working communication with the PLC there must be defined how the software has to communicate with the PLC. Therefore you have to right-click on "Tag Management" it opens the context menu. Choose "New Driver Connection...".

Configure the interface as described in Set PD/PC-Interface.

1. Start WinCC by using the desktop link or the program entry in the start menu.

("letter") symbol to start a new project.

Add new driver

Suchen in: bin

- SIMATIC S5 Ethernet TF.CHN   SIMATIC TI Serial.CHN
- SIMATIC S5 Profibus FDL.chn   System Info.chn
- SIMATIC S5 Programmers Port AS511.CHN   windows dde.chn
- SIMATIC S5 Serial 3964R.CHN
- SIMATIC S7 Protocol Suite.chn
- SIMATIC TI Ethernet Layer 4.CHN

Dateiname: SIMATIC S7 Protocol Suite   Öffnen

Dateityp: WinCC Communication Driver (*.chn)   Abbrechen

7. In the "Add new driver" dialog select the driver which fits to your PLC For a S7 PLC choose „SIMATIC S7 Protocol Suite.chn". If you want to use an other PLC please inform yourself first, which driver fits with your PLC.

It is very important that the selected driver fits with the PLC otherwise the connection cannot be established.

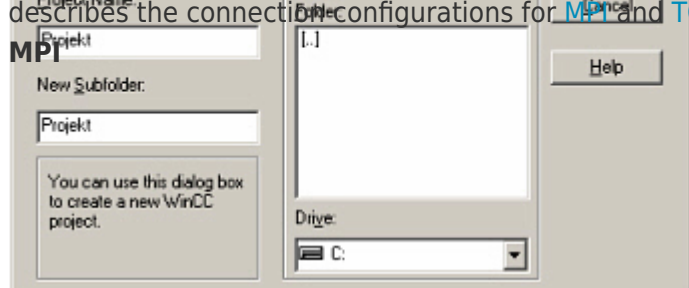2. The next dialog offers you several project types "Single-User Project", "Multi-User Project" and "Client Project". The next steps are the describing for the "Single-User Project".

8. The next steps are now in the Explorer under the branch "Tag Management" the branch "SIMATIC S7 PROTOCOL SUITE". Expand the branch and many protocols for various compounds will appear. The General way of proceeding a new connection is to: Right-click on the desired connection (MPI - > Picture: "MPI", TCP/IP - > Picture: "TCP/IP"). A context menu opens. Click on „New Driver Connection...". This manual describes the connection configurations for MPI and TCP/IP

MPI

Create a new project

Projekt

New Subfolder:

Projekt

You can use this dialog box to create a new WinCC project.

Create

Cancel

Help

Drive:
C:

4. "OK" leads you to a new dialog. Type in the "Project Name" and the "Subfolder" of the project path. The chosen configuration is confirmed with "Create".
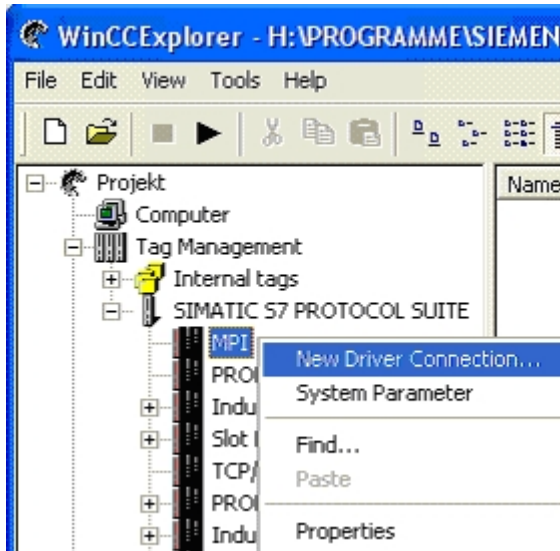
TCP/IP
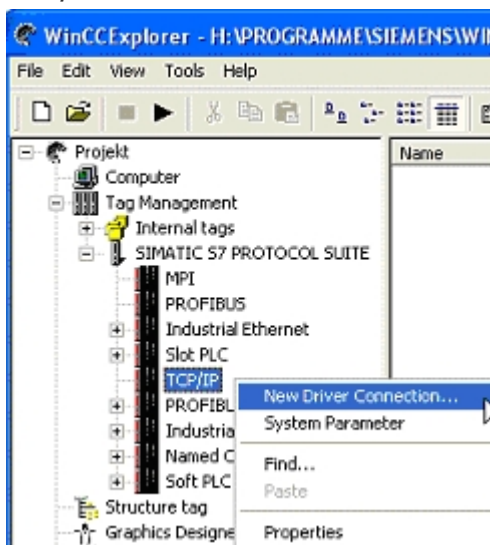
6.2.4.1 MPI Configuration

9. Now you are able to type in the name of the connection. With a click on "Configuration" a new dialog will appear. Now you are able to set the properties of the connection. Set up the station address of the PLC (in this example "2"). Confirm with "OK" until you are back to the main window. Read further "Communication and fault diagnosis " .

6.2.4.2 TCP/IP Configuration

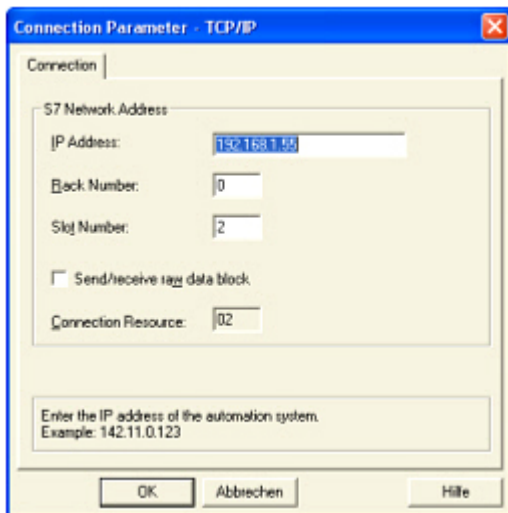10. A dialog appears where you can configure the connection parameters. Set up the IP - Address of the module and configure the rack number as well as the slot number. Confirm this configuration by clicking "OK". Example configuration:

IP - address 192.168.1.55

Rack - Number: 0

Slot - Nr.: 2

11. With a right-click on the new connection you can start the properties dialog. In this dialog please click on properties.
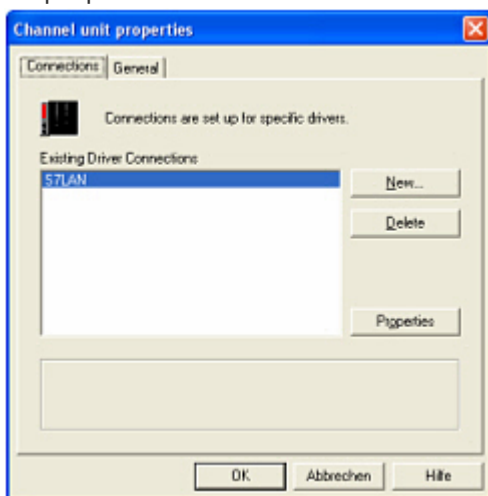
12. In this "Channel unit properties" you are able to see all "available connections". Choose the latest created connection and click again on „Properties". Now you can see all the variables which has been created for this connection. In fact this connection is a new connection so there should not be any variable in the list. To add a new variable click on „New".

13. Now you are able to set up the name of the variable and different more properties. In our example, we assign the following values: Name: „S7LAN_MW0"

Data type : „unsigned 16 - Bit value"

Length: „2"

Address: „MW0"

Format adaptation: „WordToUnsignedWord" Click on „Choose" beside the Address to define the address from the variable.

Example configuration: The data area from the variable is set to „Mark" and the address is set to „Word". The edit box „MW" is set to „0".

14. Confirm all open dialogs with „OK" until you reach the main window.

15. The connection needs to know which network interface card it should be used to send data via the

Ethernet. Open the "System parameters"dialog from the context menu (right-click on TCP/IP).

16. Choose from the registry card „Unit" and set the "logical device name" to your network interface card (usually the name of the NIC begins with a „TCP/IP - > „).

17. Confirm with „OK".

18. Now you are able to start ▶ the communication. Stop it by clicking on ■.

6.2.4.3 Communication and fault diagnosis

To clean up errors faster the WinCC Software offers a tool named "Channel Diagnosis". This tool analyses all connections from your WinCC software. For demonstration purposes please stop the last started connection from your WinCC explorer.

19. Start the software "Channel Diagnosis" by using your link in the start menu.
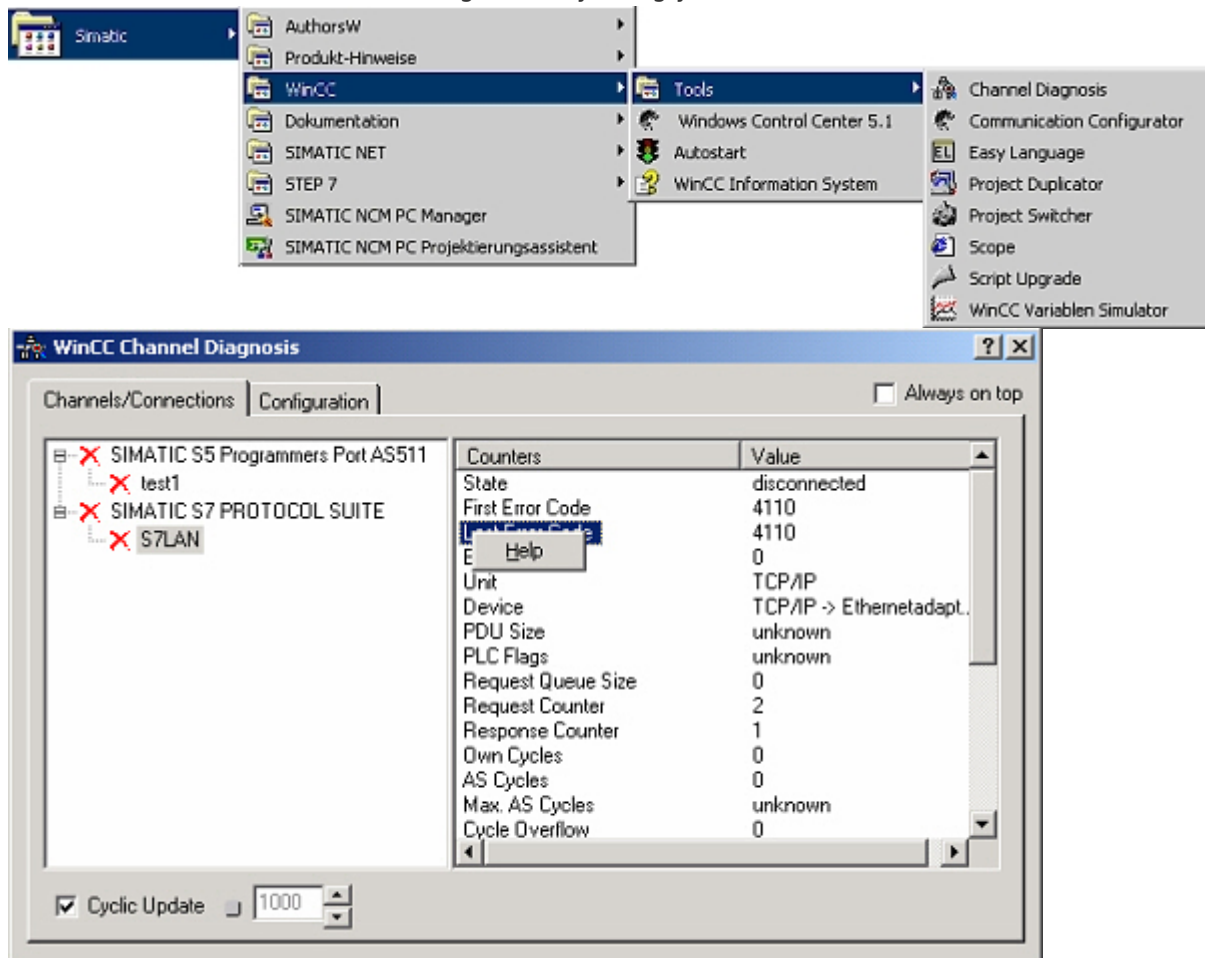
20. The tool could not detect a running connection so it marked the connection/s with a red 'X' (registry card "Channels/Connections"). Click on the last created, not active connection (with the red 'X') and some informations from the connection will appear in the right part of the dialog. One of these counters is called "Last Error Code".
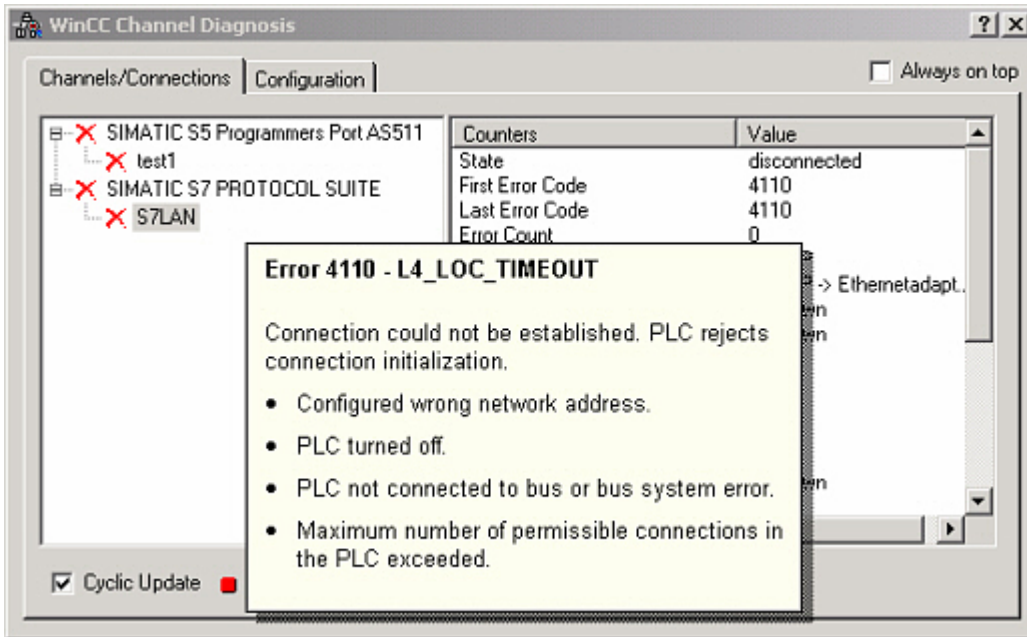
21. If you take a right-click on the error value a window opens with "Help". Click on the "Help" window and a yellow window appears (tooltip) with detailed error descriptions.

22. Lets see what happens if the connection runs properly. Start the connection from your WinCC Explorer. The "Channel Diagnosis"dialog marks the connection with a green hook if everything worked out.
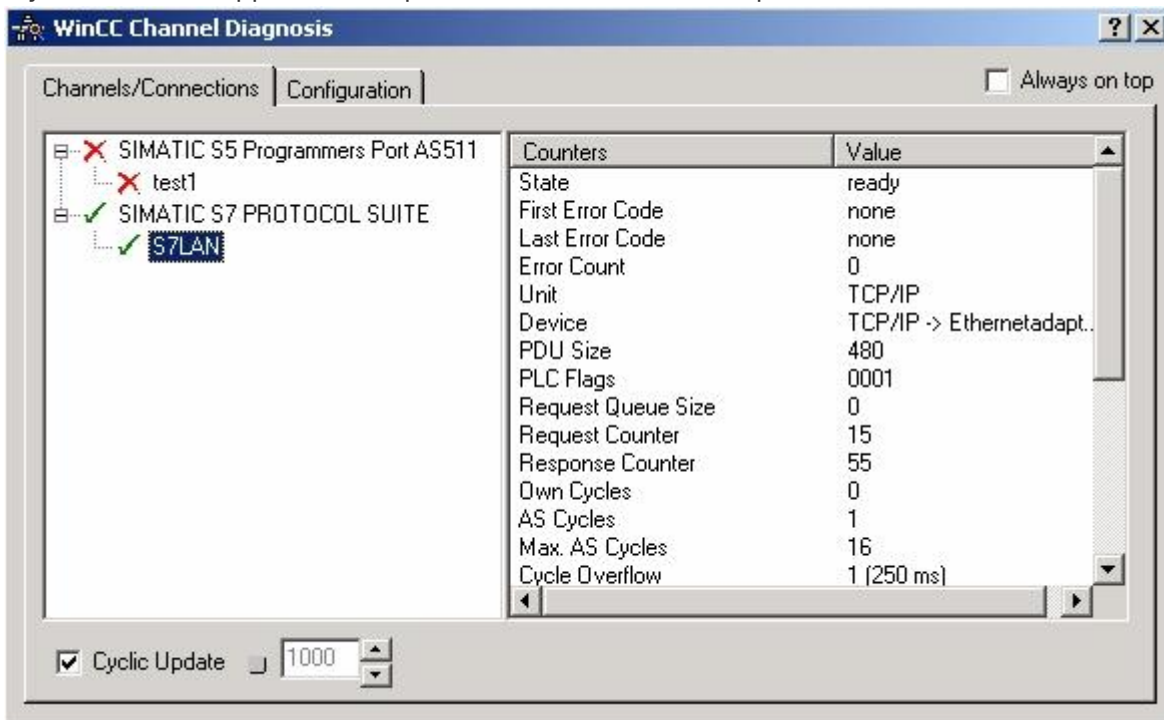
6.2.5 Windows Control Center flexible 2004 (WinCC flexible) (v5.2.0.0)

Please make sure that the interface configuration is correct as described in PD/PC-Set interface
1. Start the WinCC flexible 2004 software by using the desktop link or the program entry in the start menu.
2. First you need to select "Create an empty project" on your first page.
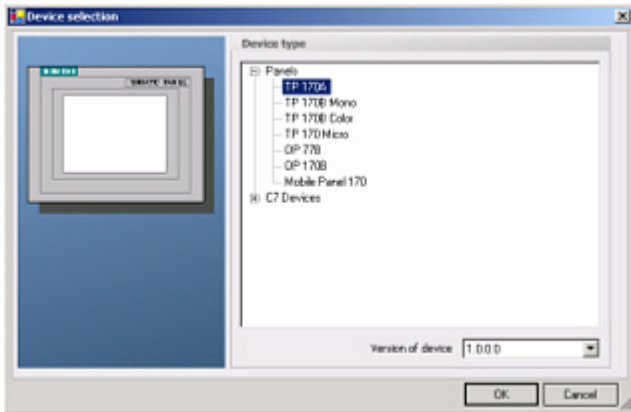
3. In the "Device selection"mark the used operator panel (example: "TP 170A") confirm with "OK".
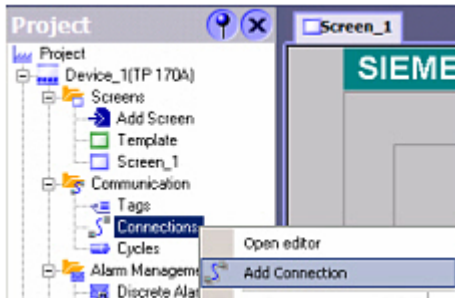
4. After the project has been created right-click in the project window on "Connections"of the sub menu "Communication". In the context menu click on "Add Connection".

5. A new configuration window "Connections" opens in the right part of the main window. This offers you different setting options. Important for the connection is:

⇒ the communication driver (set up which PLC you are using (example: "SIMATIC S7 300/400"))
⇒ the Baud rate (Set this on "187 500")
⇒ the address of the terminal (HMI) (in this example "1")
⇒ the Profile ("MPI" for example)
⇒ the Highest Station Address (HSA) (e.g. "126")
⇒ the address of the PLC (e.g. "2")
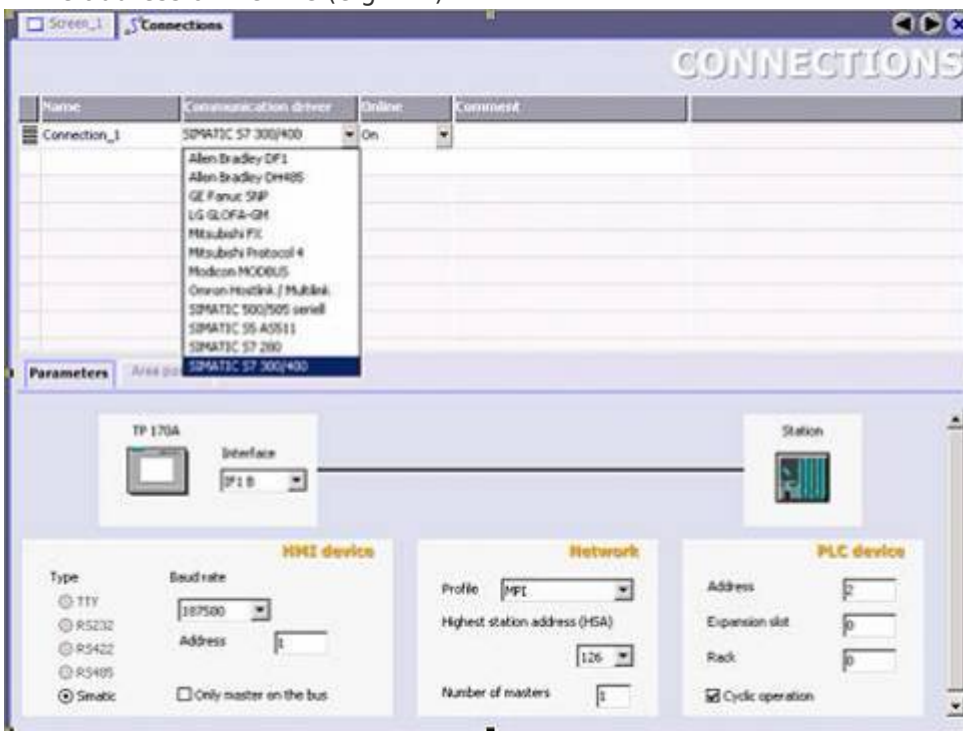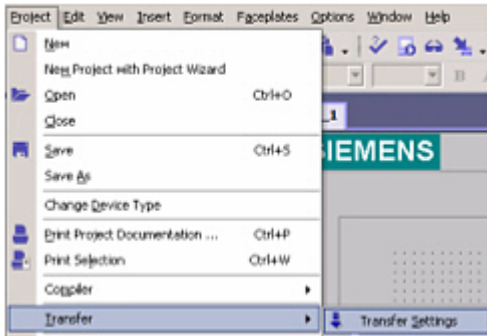
6. Now you can start with your work. If you have finished work you can transfer this project to the panel by reading the next steps.

7. Choose „Transfer Settings" from the sub menu „Transfer".

8. In the new dialog change the „Mode" to „MPI/DP" and set the „Station address" of the operator panel (e.g. „1"). If desired you can switch the „Delta transfer" to „On" (in this example we set it „Off").
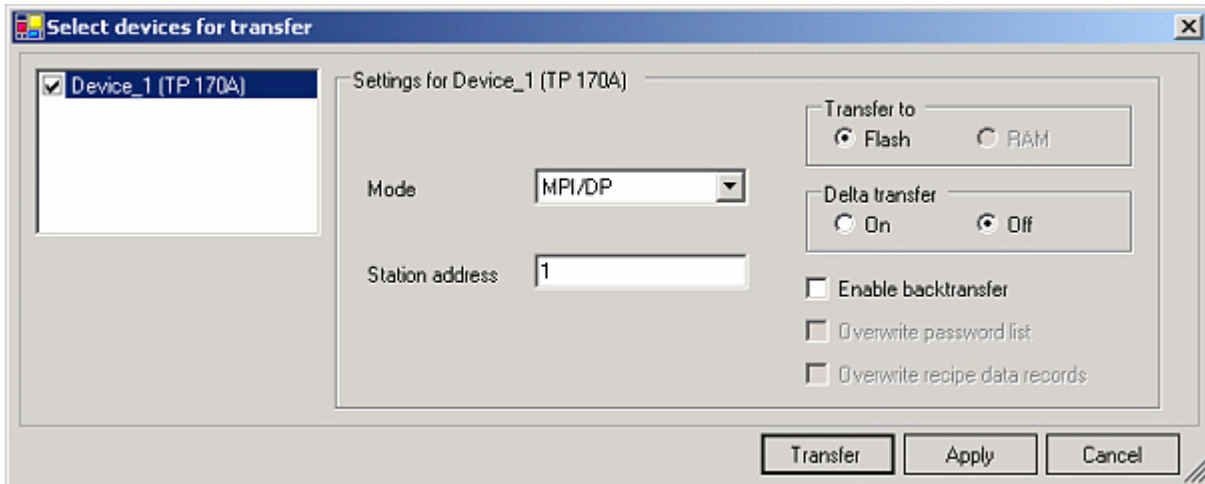
9. Press the button „Transfer" to start communication with the terminal. Your project is about to be transferred. The WinCC flexible software is now able to communicate with your operator panel.

6.2.6 ProTool/Pro v6.0 SP2

Please be sure that the interface configuration is correct as described in PD/PC-set interface

1. Start ProTool/Pro by using the desktop link or program entry in the start menu.

2. Choose from the menu „File" the sub menu „New" or click on the right symbol.
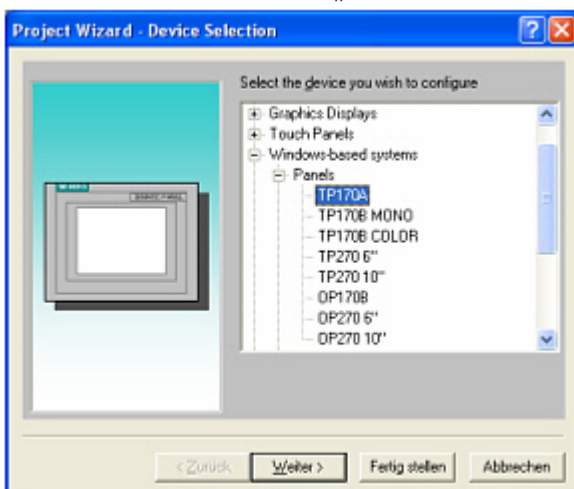
3. The next dialog let you select which operator panel you are using. Mark the used panel (e.g. „TP 170A")
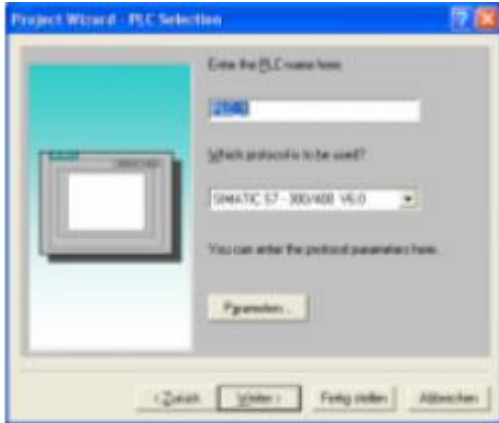
4. „Next" leads you to a new dialog. Type in the specific fields the name of the PLC device and choose the used PLC in the driver selection (e.g. „SIMATIC S7 – 300/400 V6.0").
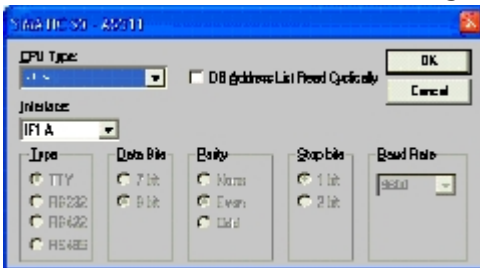
5. Via „Parameter…" you are calling an configuration dialog from the chosen PLC driver Set up the station address of the panel (example „1") and of the PLC (example „2"). Leave the point "Interface" in the standard configuration. In the sector „Net parameter" choose the interface which uses your module on the PLC (e.g. „MPI"). Configure the baud rate to „187.5".

6. The button „More …" leads you to a small dialog where the „Highest Station Address" should be configured to „126". Set up the „Number of masters" (e.g. „1")

7. confirm with „OK" until you got back to the „Control Selection".Go on with „Next". 8. In the main window start the Transfer Settings dialog by clicking on „File" „Transfer" „Settings…". Choose „MPI / PROFIBUS DP" from the listbox and type in the station address of the operator panel (e.g. „1"). Confirm with „OK". and start with your work If you have finished working on this project you can go on with the next steps.
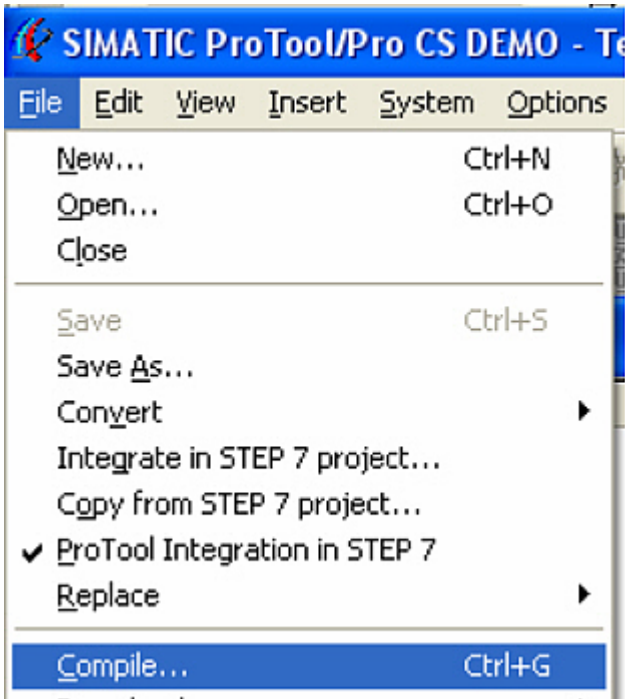
9. If you want to transfer you project to the panel you have to generate the project first. This can be done with a click on „File" -„Compile".
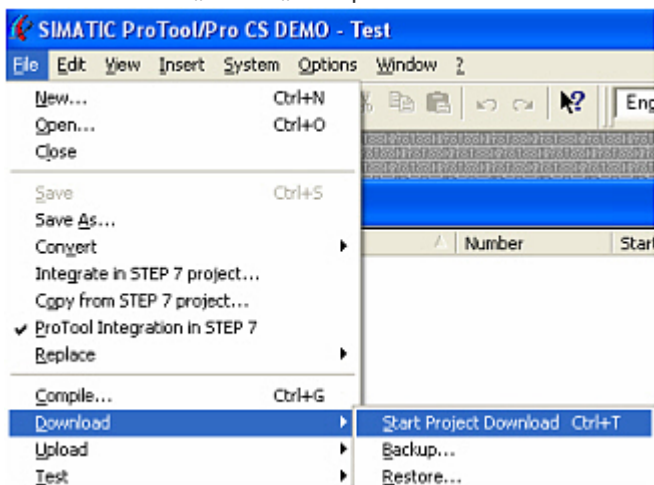
10. To transfer the project just click on „File" „Download" „Start Project Download" or click on the right symbol .

Please wait while the project is transferred. The communication between the operator panel is now established.

6.2.7 Microwin v3.2 (only for S7 200)

Please be sure that the interface configuration is correct as described in PD/PC-set interface
1. Start Microwin using the desktop link or program entry in the Start menu.
2. Click on „Type" in the menu „PLC

RUN
STOP

Compile
Compile All

Clear...
Power-Up Reset

Information...
Program Memory Cartridge
Erase Memory Cartridge
Create Data Block from RAM
Time of Day Clock...
Compare...

Type...

Select a CPU type and version, or read the PLC type from the PLC if you would like the software to range-check parameters for the PLC's allowable memory ranges.

PLC Type CPU 224   Read PLC
CPU Version 01.22   Communications...
OK   Cancel

Configure the „PLC Type" (e.g. „CPU 224") as well as the „CPU Version" (e.g. „01.22") to the dialog.

Address
Local: 0
Remote: 2
PLC Type:

☑ Update PLC type in project

Network Parameters
Interface: PC/PPI cable(COM 3)
Protocol: PPI
Mode: 11-bit
Highest Station (HSA): 31
☑ Supports multiple masters

Transmission Rate
Baud Rate: 19.2 kbps
☑ Search all baud rates

PC/PPI cable(PPI)
Address: 0
Double-Click to Refresh

Set PG/PC Interface   OK   Cancel
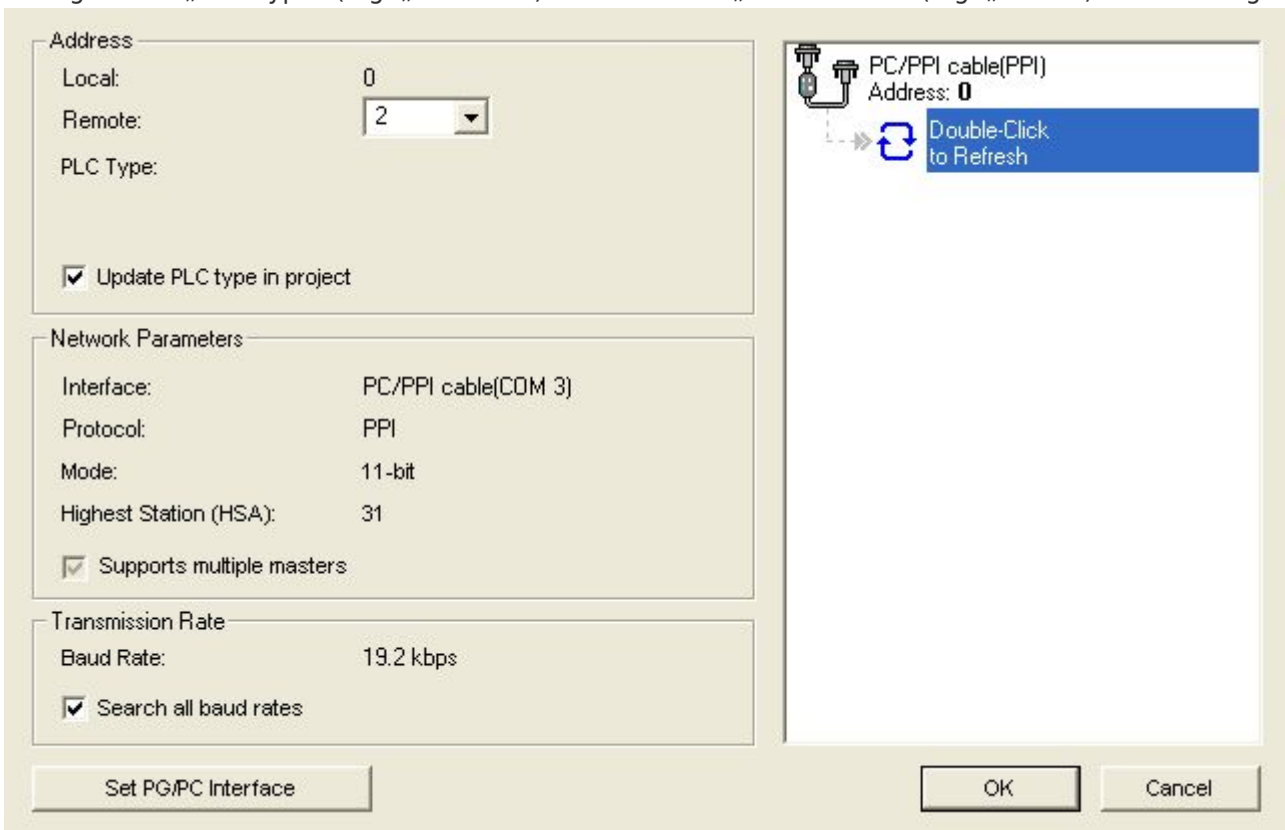
3. Click on „Communications..." to start the next dialog. In the sector „Address" set up the „Remote" listbox with the station address of the PLC (e.g. „2").

If you skipped the point b („ PD/PC-set interface") you can configure the PG/PC interface with a click on „Set PG/PC interface".

4. In the right part of the dialog double click on the blue arrow ⟳ symbol to test the communication with

the PLC.

5. The sector „Address" should be updated and displays the „PLC Type". Also the CPU of the PLC is displayed in the right part of the dialog.

6. Confirm with „OK" until you get back to the main window. The communication with the PLC ist now established.

6.2.8 Microwin v4.0 in PPI-Multimaster-Mode

1. The PPI-Multimaster-Mode was developed that more devices can communicate parallel with one PLC. The following steps describe how to configure this mode in hardware and software.

2. The module or cable has to switched in the PPIMulti-Mode. This mode can be switched in the menu-tree under „Generally" and „Bootconfiguration"

3. There you have to select „PPIMMaster" and confirmed with „Saving".
For LAN-devices you can do this in the integrated WebServer, also.

4. Now, you have to configure the PG/PC - Interface. This could you also do within the Microwin-Software.

5. Start your Microwin-Software.

6. Click on the button „Set PG/PC-Interface" under „View" in the left down part of the window.

7. Select the entry „PC/PPI cable(PPI)" and click on the button „Properties".
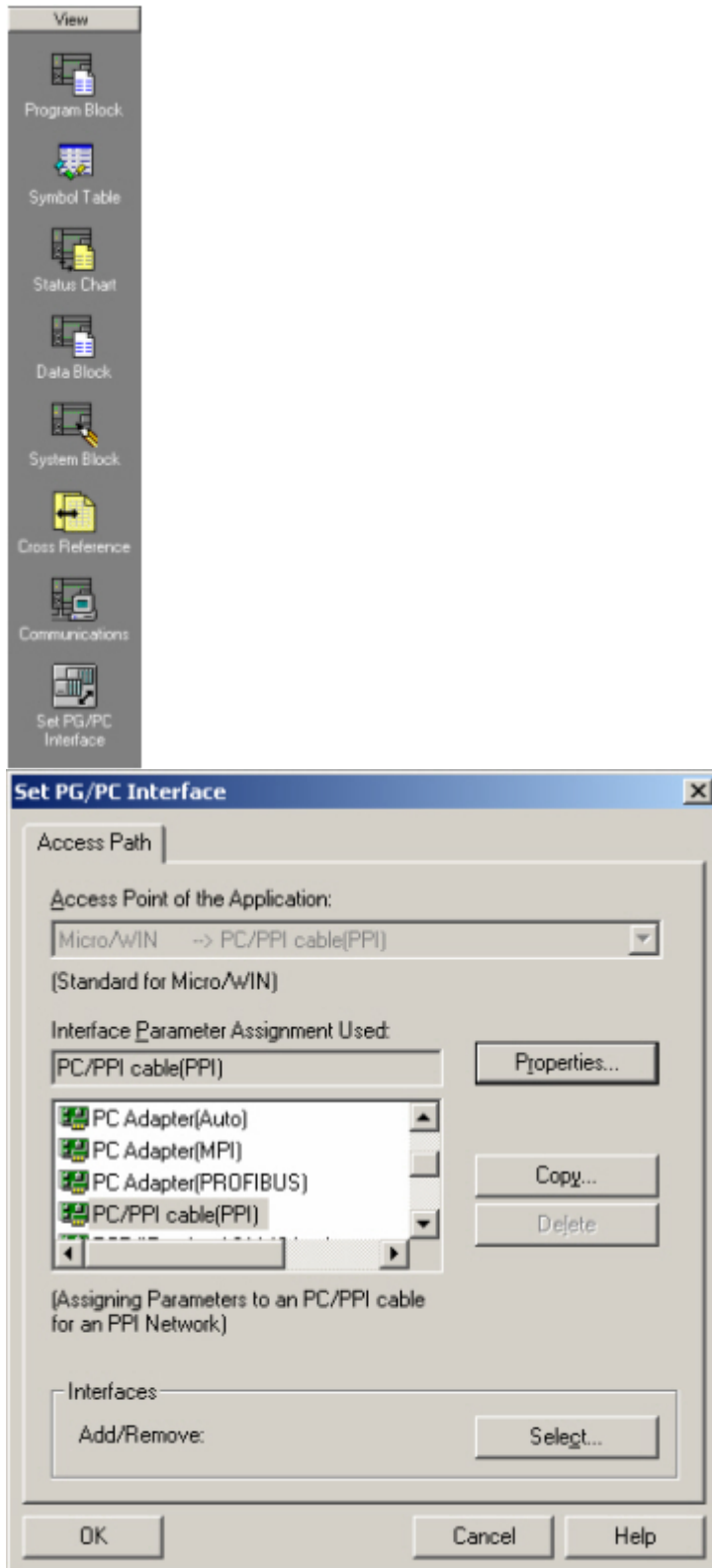
8. In the menu „PPI" you are able to configure diverse settings like for e.g. "HSA".
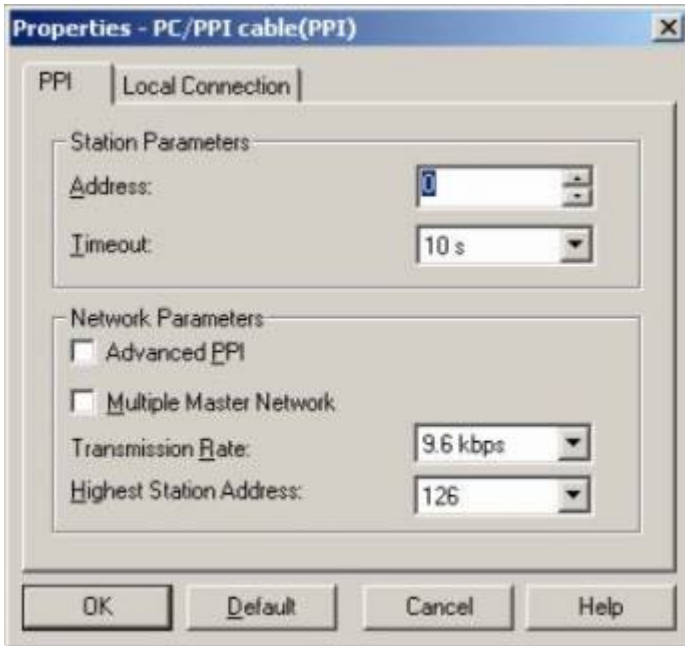
9. In the menu "Local Connection" you select the com-port "Interface to" to the port which is served from the tool PLCVCom. 10. Click on the button "OK" and click in the left down area in your windows on „Communikations".
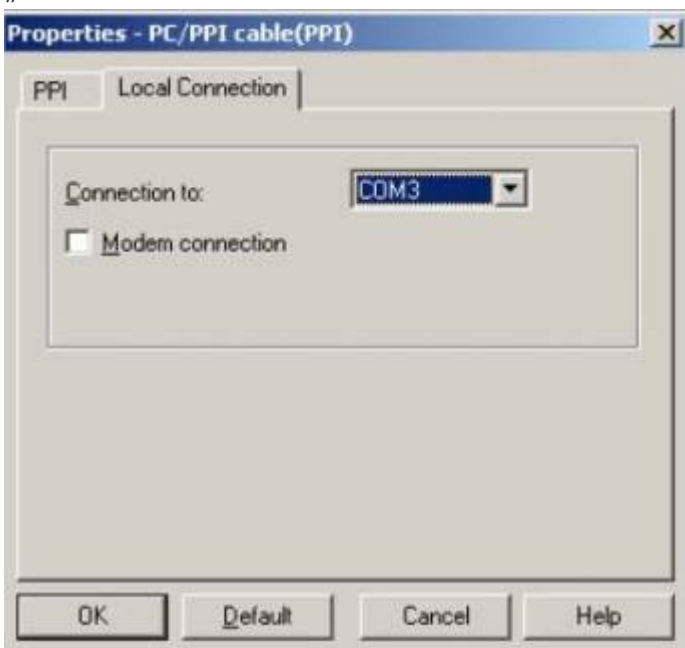
11. Click double on "Double-Click to refresh". The PLCs would be searched.
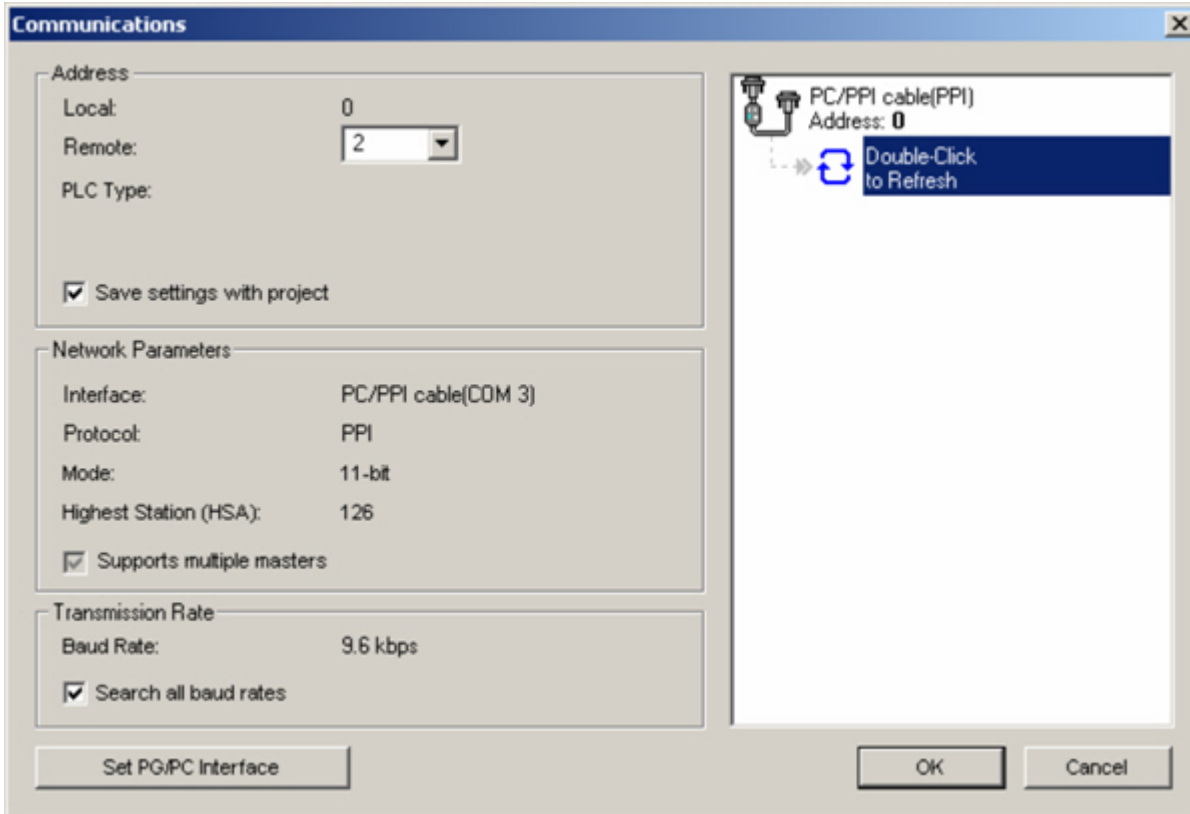
12. When the PLC was found, the picture changes it like this:
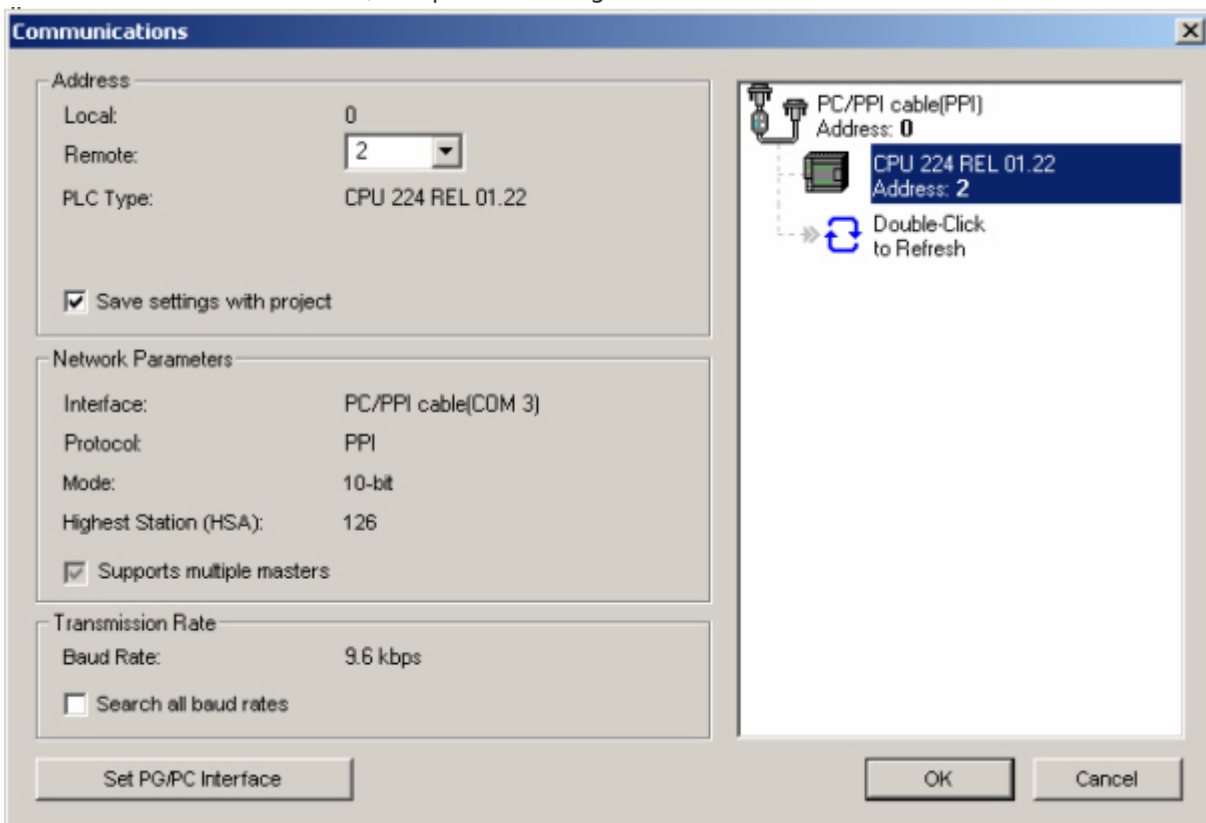
13. Prove the dialog with „OK" until you would be in the main window. The communication to the PLC is now ready.

6.2.9 S7 for Windows v5.02

1. Start the „S7 for Windows" software by using the link on your desktop or use the link in your start menu (standard is „Programs\S7 for Windows\S7 for Windows")

2. Choose File - >Preferences... to configure the communication configuration between the computer and the PLC. A new dialog appears which provides to set up a lot of configuration data about the communication with your PLC.
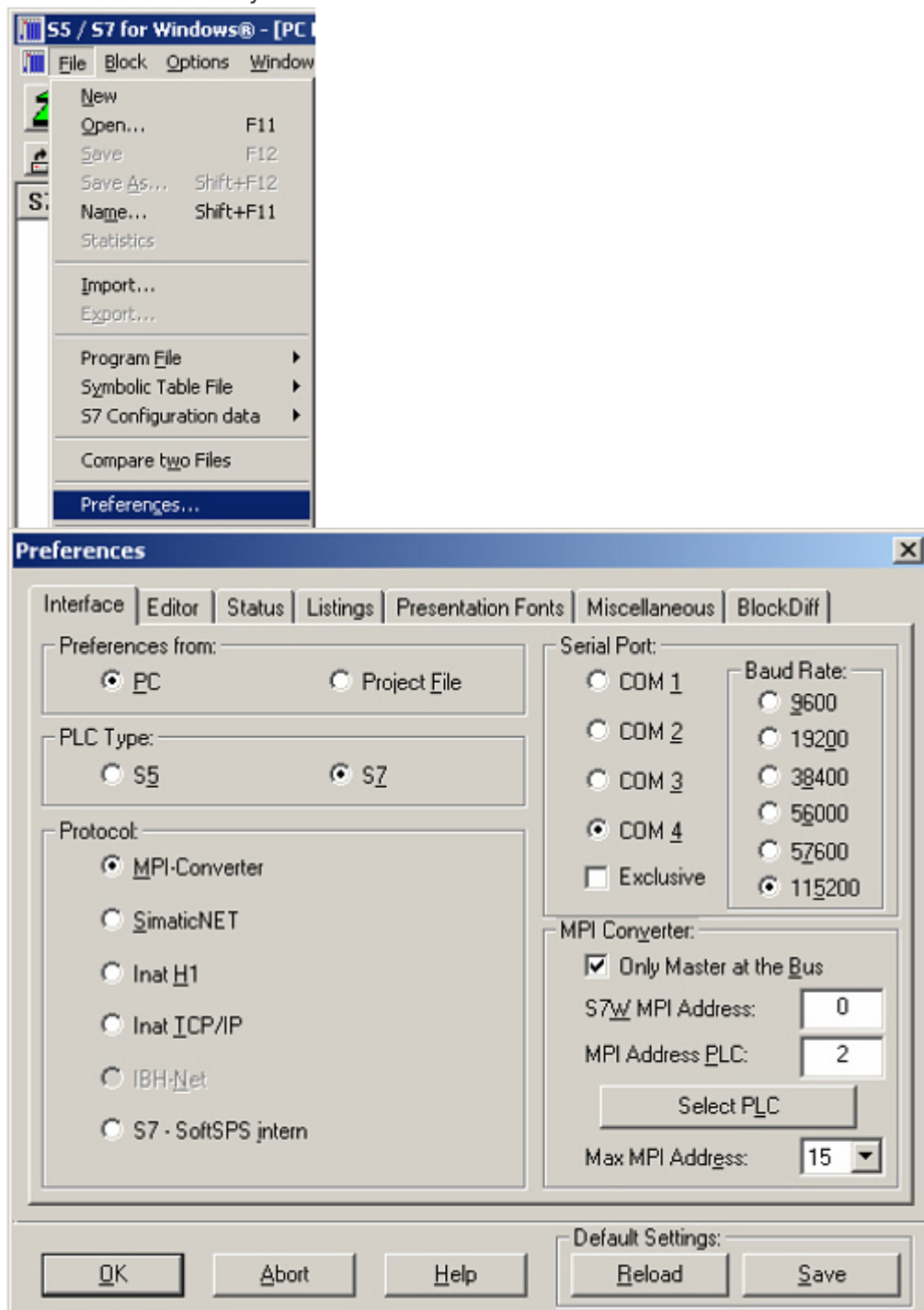
3. Choose the first registry card „Interface" (standard) and set up the configuration data as described below:

⇒ Area: „Preferences from:" ⇒PC

⇒ Area: „PLC Type:" ⇒ S7

⇒ Area: „Protocol:" ⇒ MPI - Umsetzer

⇒ Area: „Serial Port:"

⇒ Choose the virtual COM port which has been created by PLC - VCom (e.g. „COM 4").

⇒ Area: „Baud Rate" ⇒ Choose the speed you want to use at the bus (e.g. „115200")

⇒ Area: „MPI Converter:" - Activate the checkbox „Only Master at the Bus" if you have only one PLC in the bus.

- Leave the fields „ S7W MPI Address" and „MPI Address PLC" as it is.

- The number in the listbox „Max MPI Address" must be higher than the PLC with the highest station address in your MPI bus. Otherwise every PLC which is higher than this number will not been seen (e.g. if there is only one PLC in your bus „15" is more than enough).

4. After the software is configured , please click „Select PLC" in the area „MPI Converter". A new dialog appears where you can select the desired PLC
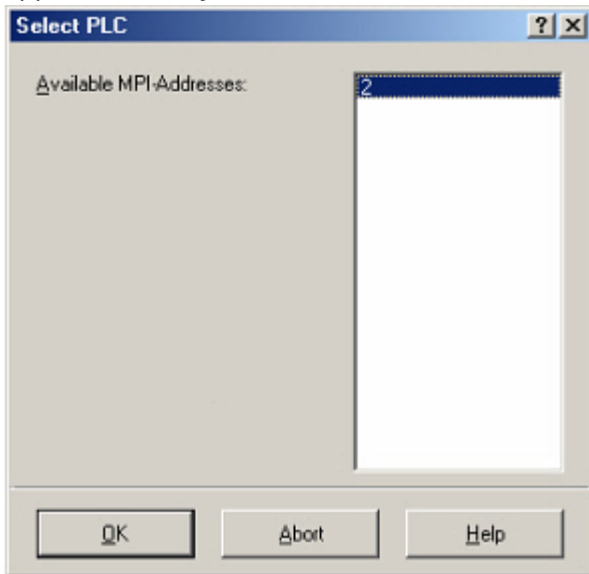
5. The dialog displays all the PLCs that can be found in your MPI bus. Select the desired one and confirm with „OK".

6. Close the preferences dialog by pressing the „OK" button.

7. Back in the main window press the „PC Block List" button for testing the new established communication configuration.

8. Please wait a moment for the software to read the desired blocks from the PLC. The blocks will be displayed in the listbox below the menu bar (see picture to the right).

Baustein	Adress
OB 1	-
SFC 0	-
SFC 1	-
SFC 2	-
SFC 3	-
SFC 4	-
SFC 20	-
SFC 21	-
SFC 22	-
SFC 28	-
SFC 29	-
SFC 30	-
SFC 31	-
SFC 32	-
SFC 33	-
SFC 34	-
SFC 36	-
SFC 37	-
SFC 38	-
SFC 39	-
SFC 40	-
SFC 41	-
SFC 42	-
SFC 43	-
SFC 44	-
SFC 46	-
SFC 47	-
SFC 49	-
SFC 50	-
SFC 51	-

The communication between the software and your PLC is established.

6.2.10 Direct setting of a slave address to a passive Profibus-Slave

With the S7-LAN-module or MPI-LAN-cable and Step7-direct-driver V1.21 (or later) and the MPI-II-cable (only with USB) or S7-USB and Step7-direct-driver V1.22 (or later) is it possible to give a directly connected Profibus-Slave a bus-address.

Important here is that the subscriber is connected directly to the S7-interface and the external supply of 24V DC is also connected. In the Step7-direct-driver must then in the properties set that "PD/PC is only master". There is no another note in this case, you will use this function as if you are connected with your PD to the module.

7 S7-Interface Configurator Help

Language selection
User interface
Bus configuration
Network settings
Parameterize TELEService
Index "Network"
Index "Modem"
Index "Serial Parameter"
Index "Access Protection"
Index "GSM/ISDN/SMS"
Index "Internet/Mail"

7.1 Language selection:

Select the menu **Configuration** to change the language permanently:

7.2 User interface:

Select near **Search** which interfaces are searched permanently for devices.
You could choose:

• Serial	All existing COM-Ports are scanned for devices
• USB	Search devices which are connected by USB
• LAN	Search devices on all network-cards

The button **Search** starts a parallel search on all selected interfaces.
After selecting a updateable device the button **Update** gets available.
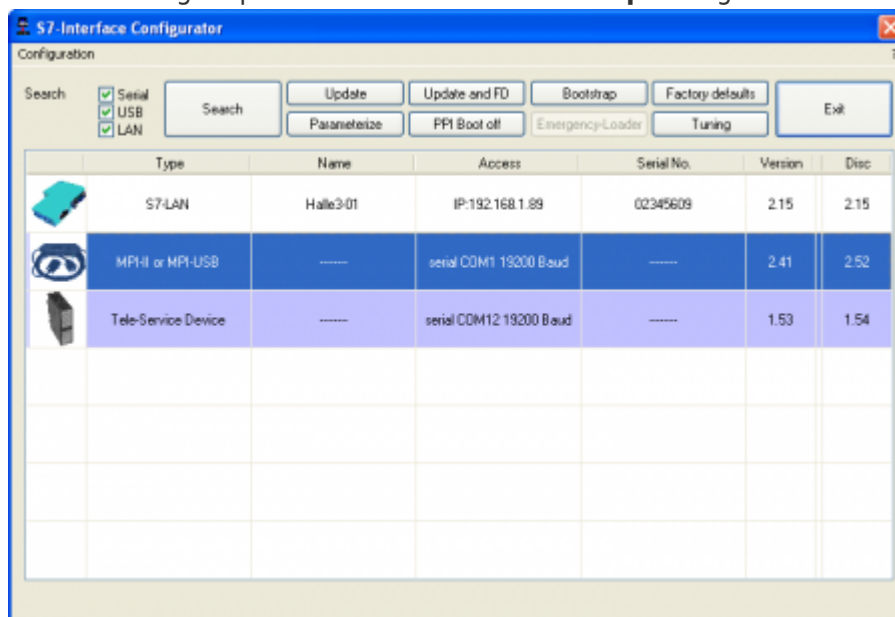
Below the buttons is a list of the found devices. In each line an image, the type of the device, name (if existing), interface, serial number (if possible) and the OS-version of the device is displayed. On the rightmost position the actual OS-version on the harddisk is displayed.
The background of the lines could use the following colours:

• White	The OS of the device is up-to-date

• Light blue	The OS of the device is not up-to-date, the device could be updated
• Red	An error occured by accessing the device
• Yellow	Update is in progress for this device
• Dark blue	Selected device

Double click onto a device which could be updated shows the version-documentation of the device (only available in German):

The button **Update with FD** updates the OS of the device and sets the factory default.

The button **Bootstrap** sets the firmware/configuration to factory default.

The button **Factory defaults** sets the configuration to factory default.

The button **Parametrize** activates a dialog regarding to the device:

Overview:

Device	Dialog
TELEService MPI / PPI - Profibusmodem	Parametrize TELEService
MPI/PPI	Parametrize TELEService
MPI-II MPI-USB	*Choices:* Bus configuration Parametrize TELEService
S7-USB	Bus configuration
S7-LAN MPI-LAN	*Choices:* Bus configuration Network settings

The button **PPI Boot off** disables the PPI boot option of a serial connected device.

The button **Emergency-Loader** tries to repair LAN products which are in emergency-loader mode.

The button **Tuning** activates a dialog for special parameters.

The button **Exit** leaves the application.

7.3 Bus configuration

To Parametrize the connection to the device, select a device and click "**Parametrize**".

Regarding to the device you maybe have to click on the button **Bus configuration** (see Parametrize table).
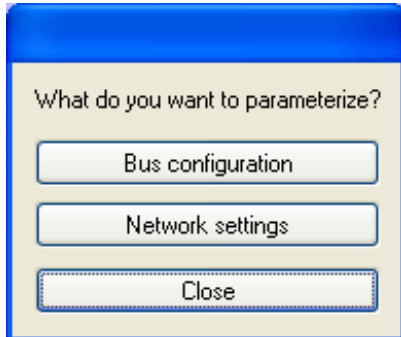
Here you can Parametrize the following:

Use bus config for PC	Tooks the bus configuration from the PC
Baud rate	chooses the Baudrate for the cable to bus communication
Highest station address	The highest station-address in the bus (the less you use, the more performance on the MPI-bus, must be corresponding with the configuration in the CPU's)
PD/PC is the only master on the bus	The TS-Adapter is the one and only master in the MPI-bus (adapter hast to speak to all passive clients)
Profile	Bustype of the connection
Local client address	Which local station-address is used for the TS-Adapter. Please consider that a programming device has normally the number 0, operator panel have 1, CPU's use 2, FM/CP's 3 etc. **Please**: Never use the same station-number for 2 different stations!
Protocol type	Protocol type of the connection
Boot settings	Boot setting of the connection

7.4 Network settings

Here you can set the network configuration of the selected device:

• Factory default	This button sets all over the network reachable devices to factory default.
• DHCP-client active	When set the device acts as DHCP-client.
• IP address	Here you could enter the IP Address over which the device is accessed in the network.
• Subnetmask	Here you could enter the Subnetmask of your network.
• Gateway address	Here you could enter the IP address of your Gateway. Usual a router address.
• Device name	Here you could change the device name.

Factory default:

• DHCP-client active	not set
• IP Address	192.168.1.56
• Subnetmask	255.255.255.0
• Gateway address	0.0.0.0
• Device name	empty

7.5 Parametrize TELEService

To Parametrize the device, first click on the device, after that on "**Parametrize**".
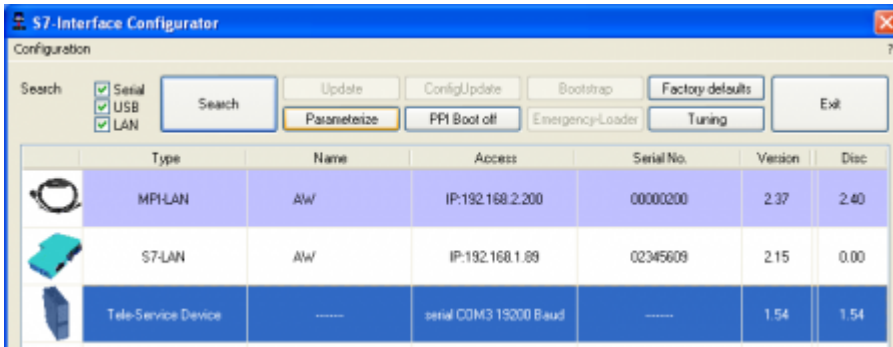
Regarding to the device, you maybe have to click on the **TELEService** button.
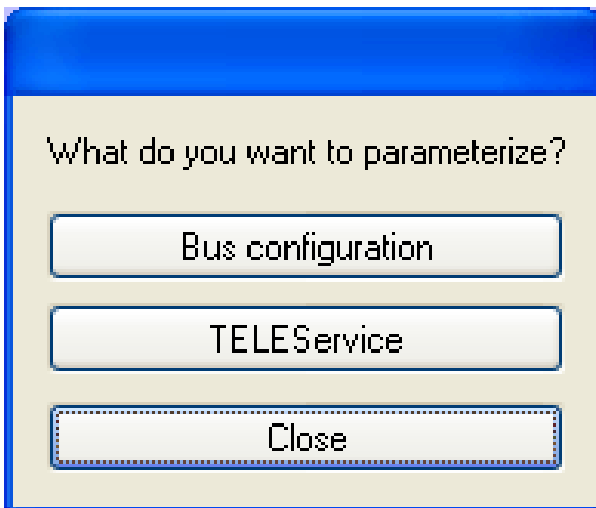
After clicking on "**TELEService**" a message will show up:
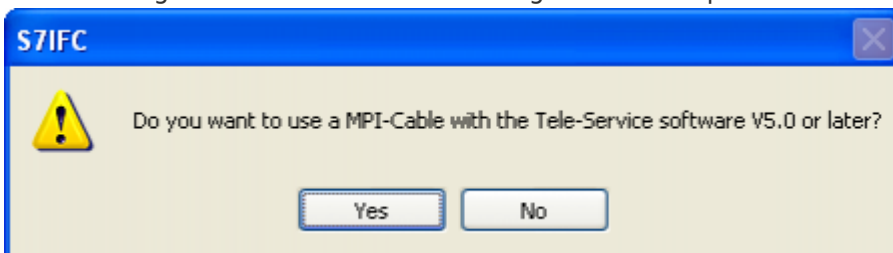
Depending on the version of your TELEService software choose **Yes** or **No**.

The regular parameters can be changed manually in the following categories:

7.5.1 Index "Network":

Here you can configure following:
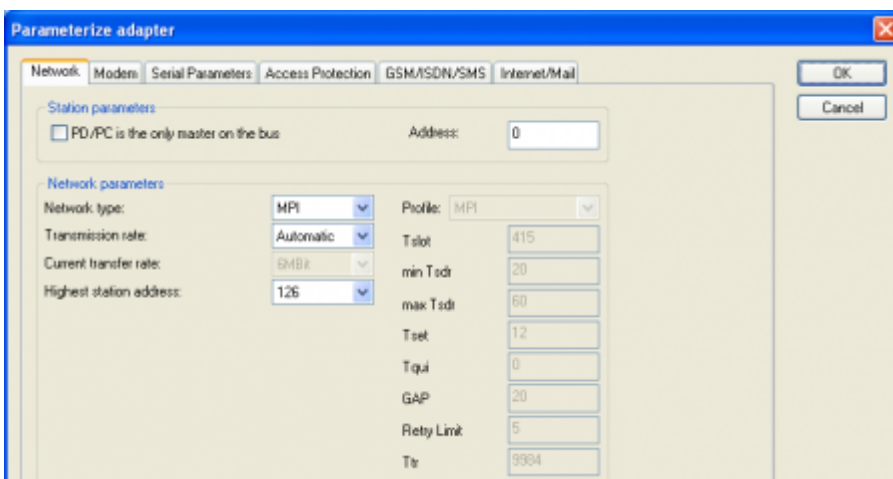
Station related:

PD/PC is the only master on the bus	The TS-Adapter is the only master on the MPI-bus (adapter must speak to all passive clients)
Address	Which local station-address is used for the TS-Adapter. Please consider that a programming device has normally the number 0, operator panel have 1, CPU's use 2, FM/CP's 3 etc. **Remind**: Never use the same station-number for 2 different stations!

Network related:

| Network type	The network type MPI or PROFIBUS
Transmission rate	The transmission speed on the MPI bus
Current transfer rate	Shows the current transfer rate of the device
Highest station address	The highest station address in the bus (the less you use, the more performance on the MPI bus, must be corresponding with the configuration in the PLC's)

7.5.2 Index "Modem":

In this dialog you could configure the modem related setup.

Modem Settings:

Initialization	The initialization string consists of several commands to the modem: AT ⇒ start command &F ⇒ use factory settings E0 ⇒ echo off L1 ⇒ volume of speaker is low M1 ⇒ speaker is on at connection Q0 ⇒ output of the return values V1 ⇒ return values plain text &C1 ⇒ DCD shows status of the carrier sound S0=1 ⇒ automatic connection after 1 ring
Hang up	The deselection text is made up of 2 parts: +++ ⇒ Switch to command mode AT ⇒ start command H ⇒ Hang up connection

Location:

Dialing method	There are two possible call techniques: MFV tone, the telephone number is transferred by several frequencies IWV pulse, the telephone number is transferred with the amount of several pulses on the line
Official number **To access an outside line, first dial**	If you need a prefix before your number to establish a call outside, you must enter the prefix here e.g. 0.

Call Preferences:

Wait for dial tone before dialing	In case the modem should wait for a free line, you should set the corresponding checkbox.
Number of redial attempts	At number of retries you could configure the number of retries for a connection before the call is stopped.
Redial after	Using a retry you could enter the seconds the application should wait between calls.

7.5.3 Index "Serial parameter":

In this dialog the transfer rate between modem and TS-Adapter is selected.
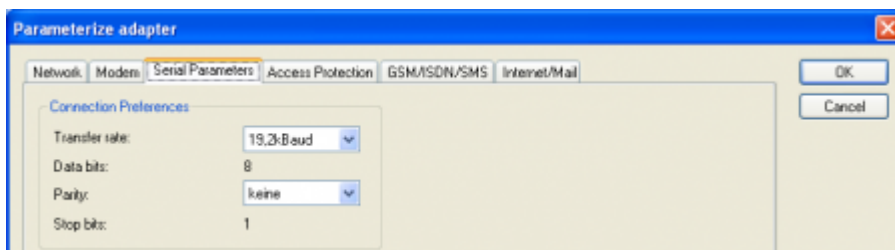
Connection Preferences:

Transfer rate	The transfer-rate could be selected between the following values: 2400, 4800, 9600, 19.2k, 38.4k, 57.6k and 115.2kBaud
Parity	The parity could be selected, but this is modem depended because some modems could not handle the parity bit: None: (There is no parity testing) Odd: (The amount of bits set to 1 is odd) Even: (The amount of bits set to 1 is even)

7.5.4 Index "Access Protection":

The access over a telephone line could be configured in this dialog.
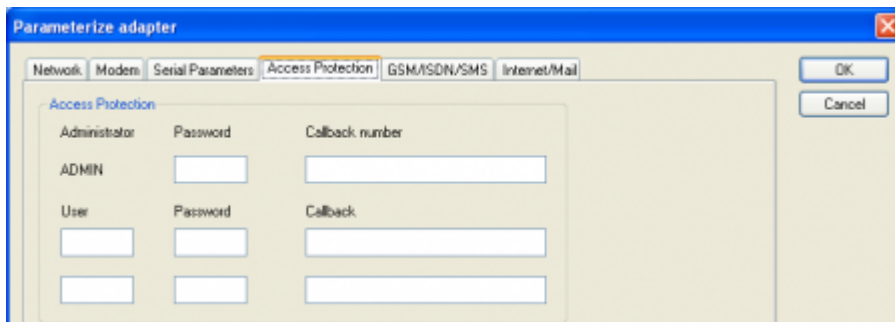
Access Protection:

The administrator can change the configuration over a telephone line. The two user accounts can not change the configuration.

The username is maximal 8 characters long. Every user and the administrator should use a password which is used to login in the TELEService over a telephone-line.

After three failed retries the connection is hanged up, so you must call again (not like the original TS-adapter).

After changing the password for a user/administrator you must re-type it again correctly.

You can enter a callback number which is used for a callback from the TS-adapter. After you dialed the number of the TS-adapter, you are asked for username and password. In case the username and password is valid, the connection is hang up and the TS-adapter calls back the configured callback number.

7.5.5 Index "GSM/ISDN/SMS":

Information about the three different devices:

Analog Modem:
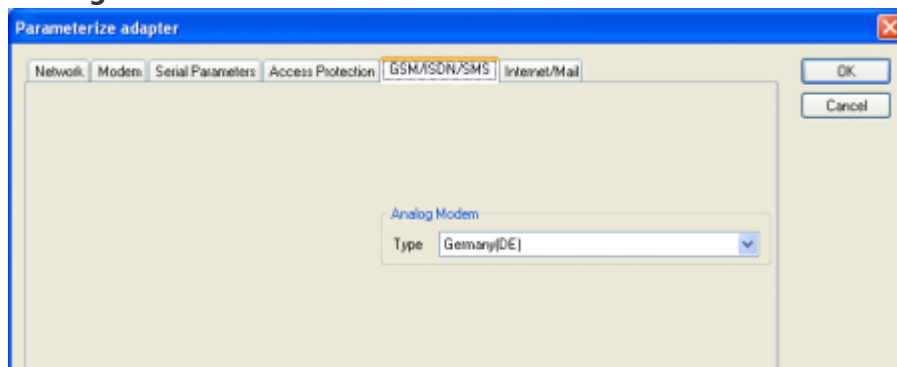
Type You could choose the location of the modem.

ISDN Modem:
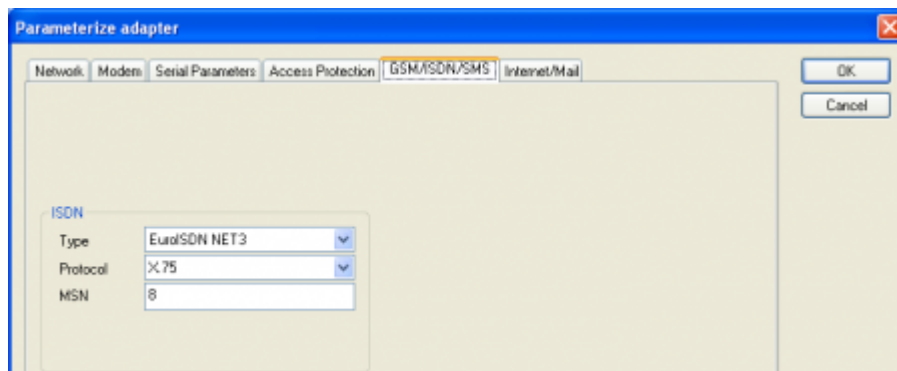
Type Choose the type of the ISDN network:
AT&T 5ESS Nothern Telecom DMS-100 EuroISDN NET3 (Standard) INS64 US NI-1 VN4 Protocol Choose the transfer protocol type:
Modem like V.120 X.75 (Standard) ML-PPP SoftBonding HDLC CLEAR MSN Multiple Subscriber Number is used for all ISDN channels. If empty no MSN is used.

GSM Modem:

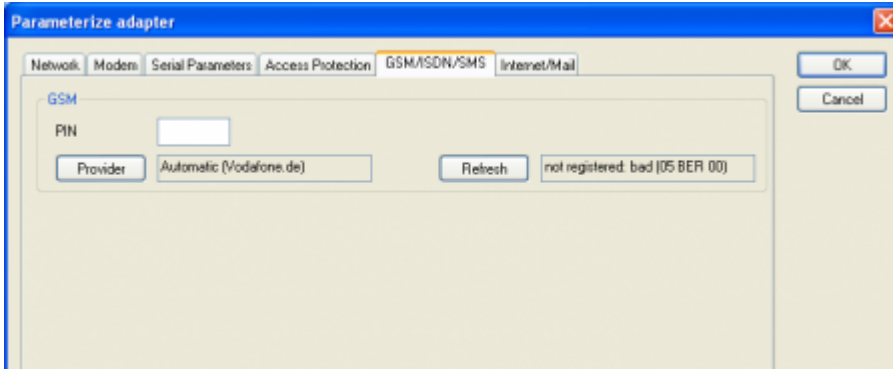| PIN	PIN number of the SIM card, up to eight numeric characters (only for TELE-SERVICE GSM).
Provider	With the button „Provider" the provider could be chosen. Read the list of providers could be elapse more than a minute. In the end the possible provider are listed for selection. With „Automatic" the GSM-Modem tries to connect automatically to a provider. On the right side of the button, the actual used selection is displayed. **Display Description:** Automatic: The provider is automatically searched and selected from the GSM-modem. Manual: The Provider is selected manually from the GSM-Modem no network registered: No connection to the GSM-network, the receive-quality is too bad set format: The format of the provider is set Manual/automatic: The modem tries to select manually the provider, if this fails an automatic search is done unknown: Unknown response from GSM-Modem
Refresh	The button „Refresh" reads the signal strength from the modem, the quality is displayed. **Display Description:** Unknown: Unknown state of the GSM-network no registration: The modem is not registered in the GSM network, no provider found registration denied: Registration in the GSM-network is denied Search network: In Search for a GSM-Provider GSM: Attached to GSM GSM(ROAMING): Attached to GSM, but with a Roaming-Partner. This could lead to high costs! The radio quality is displayed, together with the bit-error-rate. **Value Description:** 99 No network, no receive 00 Very, very bad receive-quality 01 Very bad receive-quality 02 to 09 Bad receive-quality 10 to 17 Medium receive-quality 18 to 25 Normal receive-quality 26 to 30 Good receive-quality 31 Best receive-quality

Information about the rest of the Index GSM/ISDN/SMS:

SMS:

SMS	Switches: NO SEND SMS RECEIVE SMS SEND+RECEIVE SMS DMTF CONFIRMATION SEND SMS+DTMF CONFIRMATION RECEIVE SMS+DTMF CONFIRMATION SEND+RECEIVE+DTMF CONFIRMATION SEND MAIL SEND MAIL+SEND SMS SEND MAIL+RECEIVE SMS SEND MAIL+SEND+RECEIVE SMS SEND MAIL+DTMF CONFIRMATION SEND MAIL+SEND SMS+DTMF CONFIRMATION SEND MAIL+RECEIVE SMS+DTMF QUITTUNG SEND MAIL+SEND+RECEIVE+DTMF CONFIRMATION **Attention**: before setting ON check configuration, after activating the device will go on the MPI bus and tries to connect to the defined PLC. Receive of SMS only with TELEService-GSM Receive of DTMF only with TELEService GSM
Bus address TS	local station address (should not be used twice in the MPI/Profibus!)
Bus address CPU	from this station address the flag word and data block is accessed for communication
Communication flag word	communication-flagword (the first byte is the command, the second is the state). Use even operand-addresses.
Communication data block	Address of the CPU in the Bus
Provider 0/1/2/3	Configure the SMS-Provider to use, including type, phone-number and char-code. First Input: Choose a type of the transmission. Second Input: Telephone number or email address. Third Input: Choose a character encoding.
NTP-Server	Input for an Network Time Protocol - Server

Error analysis:

The possible error conditions for the modem, mpi bus problems or other problems are displayed in this text-field.

First the modem-related information is shown:

Message

- Modem ready
- Modem error
- No answer from modem
- Modem detects ring
- End of connection
- connected via modem line
- No dialtone detected
- Phone-line or telephone busy
- Phone-number is blacklisted in modem
- Phone-number delayed
- Access denied for 1 minute
- Fax-call detected
- Data-call detected
- unknown error
- The selected direct-access-number not configured
- The configured PIN-Number is wrong for the inserted SIM-Card
- The SIM-Card is not or wrong inserted or the SIM-Card is a 5V Type

Possible MPI-Bus error-messages

- MPI/Profibus-Configuration erroneous
- Timeout at MPI/Profibus detach from device
- The local station-address is used twice in the MPI/Profibus
- A20/M20/TC35 Modem operation
- The MPI/Profibus is not correctly configured
- The HSA is not configured optimal
- The MPI/Profibus-Baudrate is not detectable
- Overflow in the internal MPI-Readbuffer
- Overflow in the internal LAN-Readbuffer
- Overflow in the serial Buffer
- The selected MPI/Profibus-Baudrate is wrong
- Overflow in internal LAN-Writebuffer
- LAN-Receive-Error
- LAN-Send-Error
- The PD-Number is wrong
- The transferred SAP is wrong/unknown
- ErrCode 01: The Destination address (XXX) of a State protocol > 127 detected. In the MPI/Profibus-Bus there are no stations possible which station number is greater than 127. (FC=YYh)
- ErrCode 02: At state-protocol the Source-Address is detected as 127. This is the Broadcast-address which is not possible.
- ErrCode 03: The received State protocols destination address (XXX respectively YYY) does not exist in the MPI-Bus. (FC=ZZh)
- ErrCode 04: The function-code (YYh) of the received State protocol from XXX is incorrect. The 7th Bit is High, but according to the specification the Bit has to be low.
- ErrCode 05: A State protocol has been received. But the function-code (YYh) means that the participant is not ready to enter the bus.
- ErrCode 06: The function-code in the State-protocol received from XXX is unknown (FC=YYh)
- ErrCode 11: The sender (XXX) of the received data-protocol is unknown. To send data the participant must get the Token. (SSAP=YYh, FC=ZZh, length=UUU)
- ErrCode 12: Data-protocol with Source-address 255 (Broadcast) is useless. (CPU=XXX, SSAP=YYh,

FC=ZZh, length=UUU)

- ErrCode 13: The sender (XXX) of the received data-protocol is unknown. To send data the participant must get the Token. (SSAP=YYh, FC=ZZh, length=UUU)
- ErrCode 14: The 7th Bit of the function-code is High, but according to the specification the Bit has to be low. (CPU=XXX, SSAP=YYh, FC=ZZh, length=UUU)
- ErrCode 15: The upper 4 Bit of the Function-code are wrong/unknown) (CPU=XXX, SSAP=YYh, FC=ZZh, length=UUU)
- ErrCode 16: Unknown function-code has been transmitted to the cable. (CPU=XXX, SSAP=YYh, FC=ZZh, length=UUU)
- ErrCode 17: Destination-SAP are defined till 3Fh in data-protocols. (CPU=XXX, SSAP=YYh, FC=ZZh, length=UUU)
- ErrCode 18: Source-SAP are defined till 3Fh in data-protocols. (CPU=XXX, SSAP=YYh, FC=ZZh, length=UUU)
- ErrCode 19: Received a data-protocol with destination-SAP=0, Connection request from another bus-participant with our cable. (CPU=XXX,SSAP=YYh,FC=ZZh,DSAP=UUh)
- ErrCode 1A: Participants are sending data to our cable with source-SAP = 0, which means that the participant has not made a connection establishment or has lost the negotiated SAP. (CPU=XXX,SSAP=YYh,FC=ZZh,DSAP=UUh)
- ErrCode 1B: Data-protocol with unknown data-function-code received. (CPU=XXX,SSAP=YYh,FC=ZZh,DFC=UUh)
- ErrCode 1C: Data-protocol with unknown data-function-code received. (CPU=XXX,SSAP=YYh,FC=ZZh,DFC=UUh)
- ErrCode 1D: Received a state-protocol with error-code. (CPU=XXX,FPGA=YYh,RAM=ZZh)
- ErrCode 1E: FPGA has caused an interrupt although no data present. (SD1=XXh,SD1=YYh,CPU=ZZZ,FC=UUh)
- ErrCode 20: Unknown protocol at PPIMultimaster-Mode. (FC=XXh,Length=YYY)
- ErrCode 21: Unknown baud-rate at PPIMultimaster-Mode. (Baudrate=XXh)

After that additional hints are displayed.

7.5.6 Index "Internet/Mail":

The internet connection is configured by PPP, often a username and password is needed. Define them in "Internet access over PPP".

Attention: This is NOT the username and password of your E-Mail-account!

In the next section "Mail" the E-Mail-account is defined:

Internet access over PPP:

Username	Username for the Internet access
Password	Userpassword for the Internet access

Mail:

Server	
Mail from	Source-E-Mail-Address (should be from the same Free-mailer, instead a delivery is often not possible)
Username	Name of the User-account (often the E-Mail-address or Customer-number)
Password	Password for the E-Mail-Account

7.6 Tuning

This menu is only used in some special cases.

Select the device and click the button **"Tuning"** and after that the following dialog is displayed:

The following configuration is possible, it will be transferred to the Cable by pressing the button „OK".

The configuration is saved permanently in the Flash-ROM:

Delay before send	At ProTool RT the communication could break down, because the MPI-Cable is transferring the answer-protocol to fast. In this case you could insert a time in 0.1ms ticks. Insert at first 300, to great values are preventing the communication.

HMI-Cable version	Some Touch-panels has the problem, that when they get a wrong version-information they never retry to connect (and then the correct version is transferred). In this case the HMI-version-information could be transferred immediately.
A20-Terminal	
Show ErrCode messages in display	Shows error messages on the display of the connected device

Boot settings:

Normally the MPI-Cable automatically selects the correct bus type, no changes are needed. In special-cases the MPI-Bus could be selected as PPI.

For example: This application and the PLC are powered on at the same time. The application is communicating immediately with the cable, the PLC is booting, in this case the MPI-Bus is not running. The MPI-Bus is erroneous, so no communication is starting. If this occurs you could choose, that the cable is working as MPI-Adapter only.

Language:

You could select the language which is used on the cable (German or English).

S5 on MPI mode off:

Deactivates temporary the "S5 on MPI" function, the cable doesn't poll the bus anymore.

send reset to cable:

Send reset to cable.

Console:

Shows some information about the status of the connection.

7.7 Factory defaults

This button sets the configuration of the selected device to factory defaults.

7.8 PPI Boot off

In PPI boot mode S7IFC cannot communicate with the cable. To disable the PPI boot mode, click on the button PPI Boot off. In the following dialog you must select the serial port where the cable is connected:
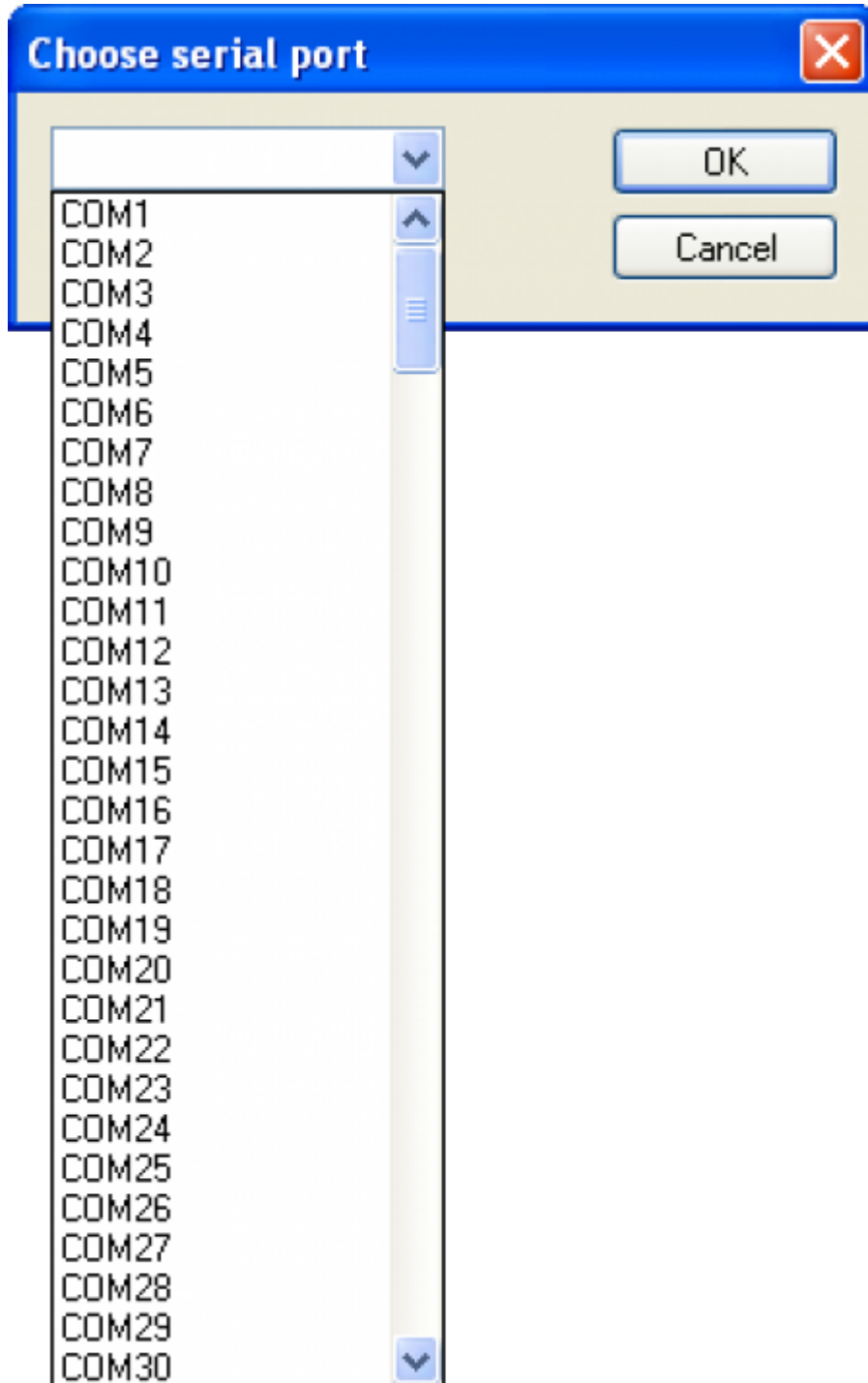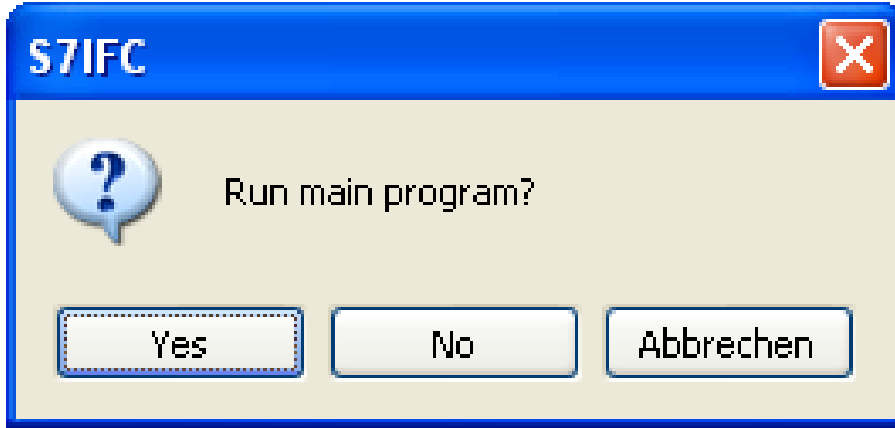
7.9 Emergency-Loader

LAN products running in emergency-loader are automatically found by S7IFC:
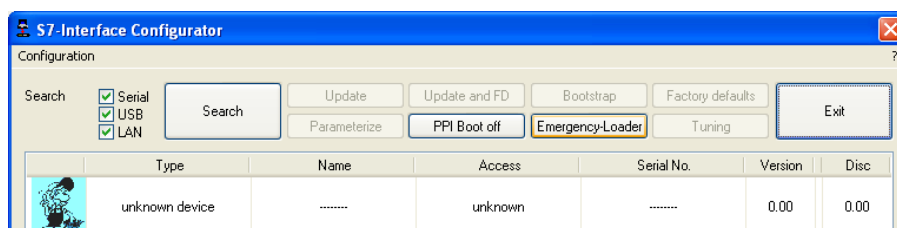
After a click on **Emergency-Loader** the following dialog appears:

On a click on **Yes** the emergency-loader tries to run the main program of the firmware.

On a click on **No** the emergency-loader tries to rewrite the complete firmware.

8 MPI cable manager

8.1 Description

The MPI cable manager allows you to install an update in your cables and modules and configure them.

The MPI cable manager can be used for the following products:

• MPI-LAN cable– Art. ID. 9352-LAN
• S7-LAN module– Art. ID. 9352-LANCon
• MPI-USB cable– Art. ID. 9352-USB
• S7-USB module– Art. ID. 9352-S7-USB
• MPI-II cable (USB – operation) – Art. ID. 9352 + 9352.1
• MPI/PPI cable– Art. ID. 9350
• Tele-Service – Art. ID. 9377-(ANALOG/ISDN/GSM)-OP
• MPI/PPI-profibusmodem – Art. ID. 9379-(G)-OP

8.2 Installation

1. Download the MPI-Kabelmanager from the product-page of your MPI-product and start the installation.
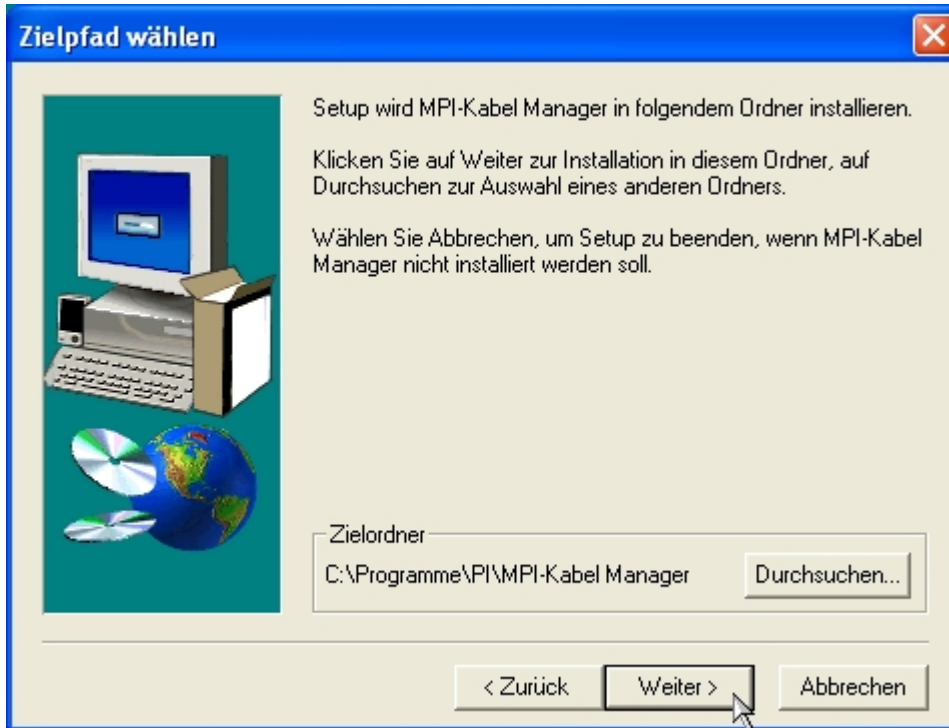
2.Following the Language selection the installation starts and a welcome-screen is displayed. Next click onto the button „Next". To change the installation path, click on "Browse". Then click "Continue".
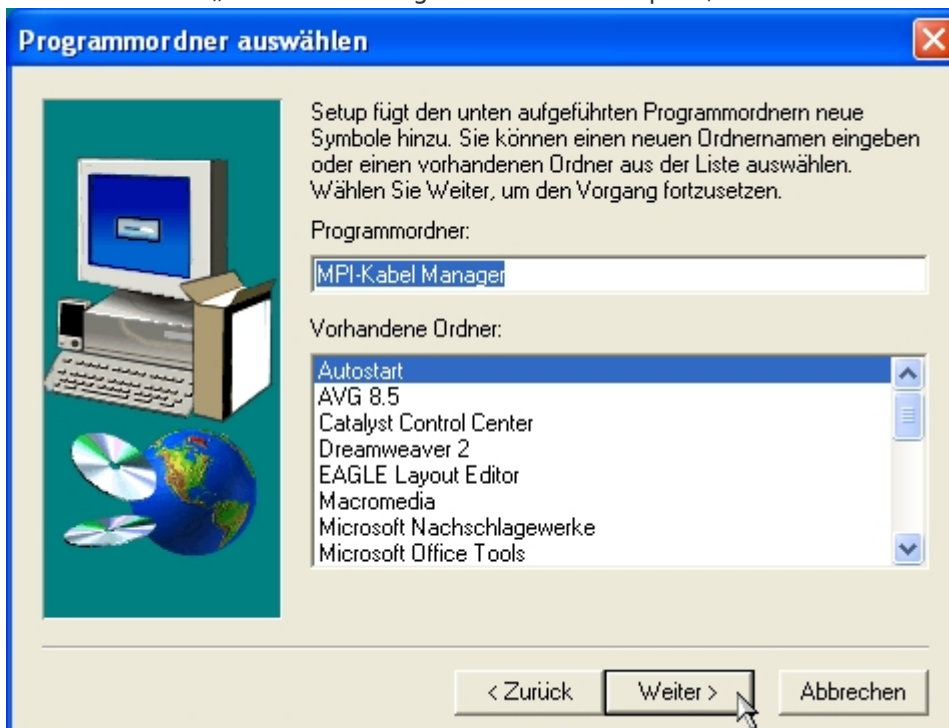
3. Select in this dialog the program folder for the MPI cable manager startup items. Then click "Continue".

4. Wait for the installation of the files. 5. End the installation after a successful copy of data with "Finish".
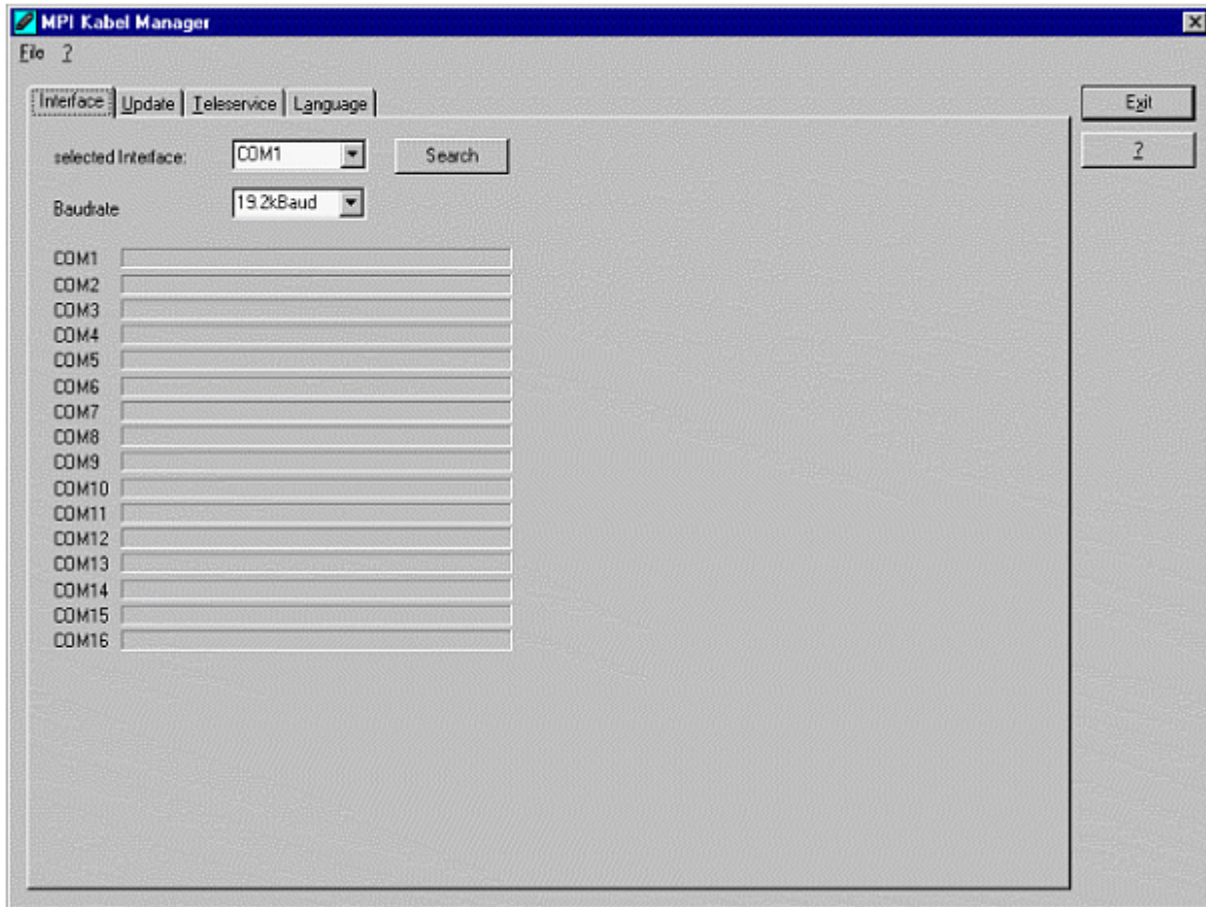
8.3 Overview

8.3.1 Language

After starting the application the tab Language is displayed at first:

In this Dialog you could choose the used language in the application.

You could choose between German and English and confirm by clicking on the desired language.

8.3.2 Interface

In „set interface" you can choose the COM-port you device is connected at. Only the COM-port which was aktive at starting the MPI-Kabel-Manager are shown.

„Search" update the COM-port listed in „set interface" and put the Kabelmanager to the respective COM-port.
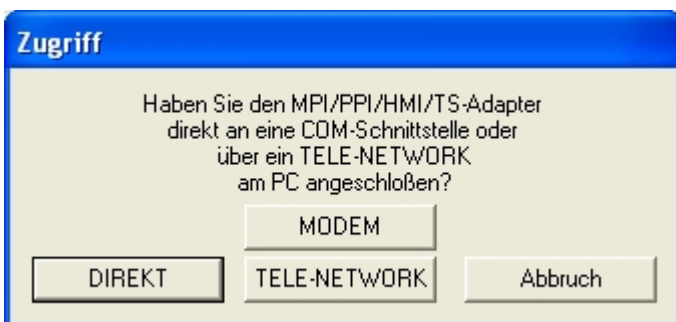
For access query choose „Direct" if your product connects via USB-cable or Nullmodem-cable. „Modem" if your product connects via telephone line or „TELE-Network" if your product connects with a TELE-Network device via telephone line. The bars below shows at which COM-port something was found or not.

8.3.3 Update
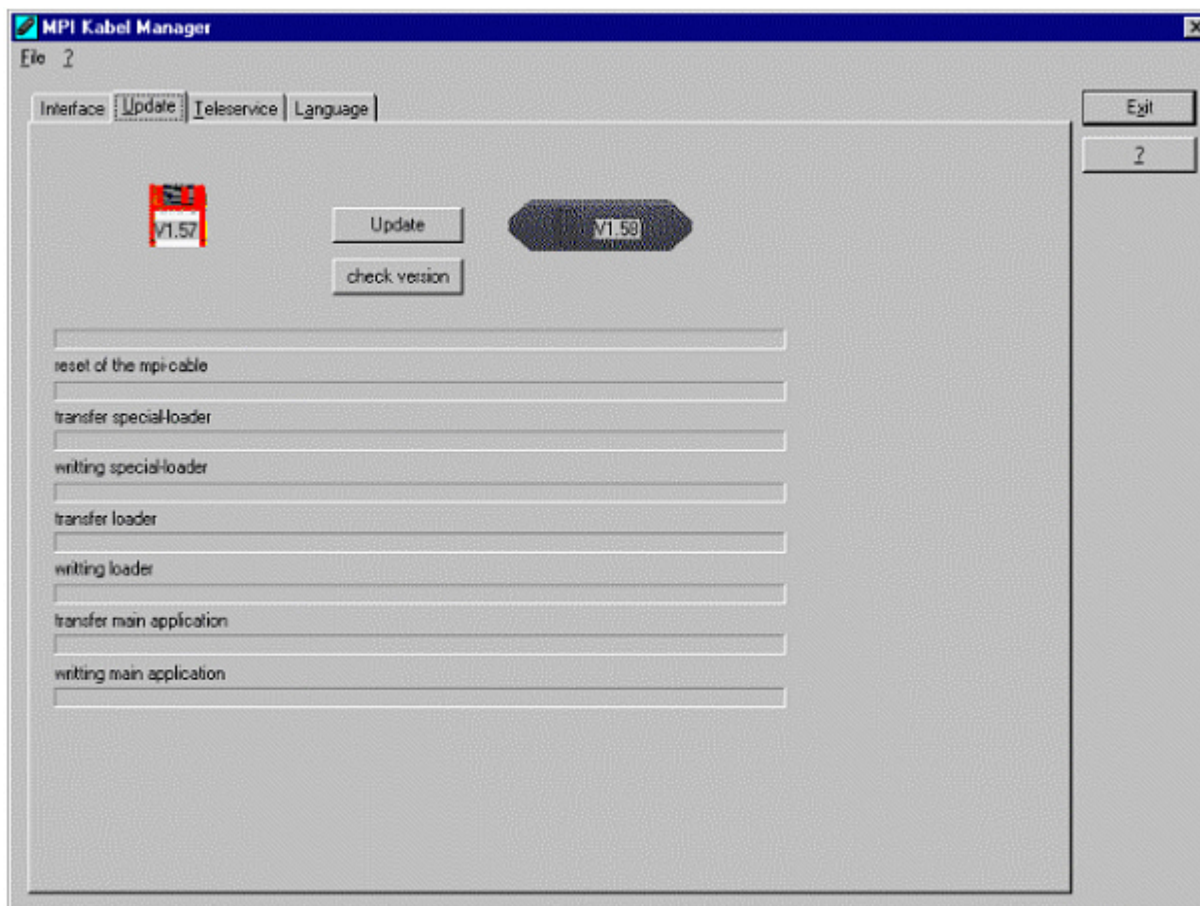
The diskette show the current operating system installed on your PC for corresponding product.

The cabel-symbol on the right show the operating system which is installed on your product at the moment.

With the button „default settings" you can set your products on default settings. Should the device be out of order after configurated. This button is selectable after the version check.

With „Update" you can install the current operating system. This button also is selectable after version check.

With „version check" your cable which is connected to the COM-Port reviewed.

The symbol next to version check shows the running update.

While update do not plug out the cable from the PLC or turn off the power supply (The cable will lost all data)!

If the update is breaking before finished, it could be that the MPI-Cable displays in the first line of the LCD „Load 1.50" and in the second line „CheckUpd". Close the MPI-Cable-Manger and restart it. After "check version" (which could time about 30 seconds) and following „Update" the broken update is restarted and finished.

8.3.4 Teleservice

In this dialog the spezific configuration of the Tele-Service is taken. There are 3 Tabs, where the last one is activated:
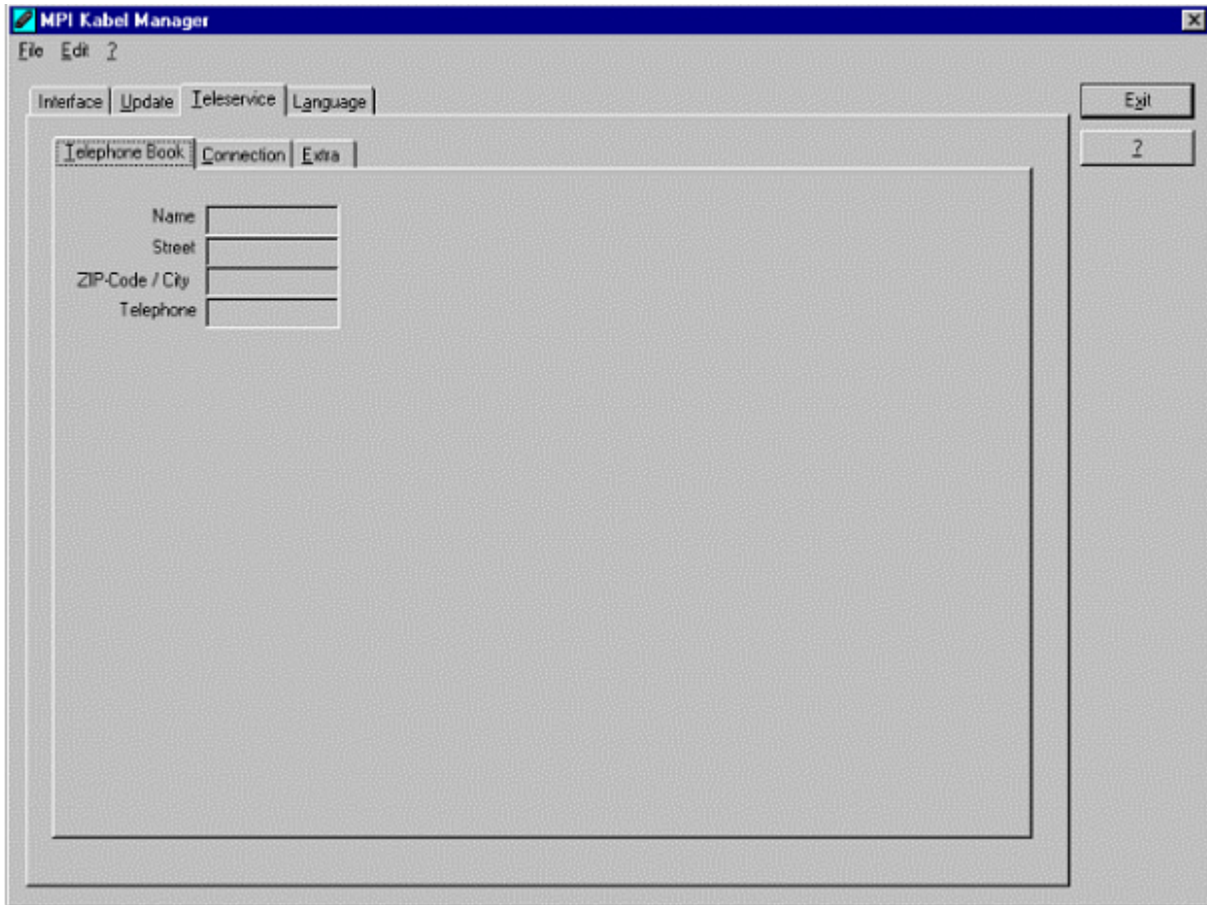
8.3.4.1 Telephone book

At the moment not implemented!

In this dialog you could define new elements or edit/erase existing elements in your telephone-book.

You could edit the following data:

⇒ Name for the connection (these are displayed at connection)
⇒ street
⇒ ZIP-code and country
⇒ Telephone number you can reach the TS-adapter

8.3.4.2 Connect

At the moment not implemented!

In this dialog the connection to another modem with a MPI-cable connected is started. Choose on the right side the named connection, then press „connect" to establish it.

With „Hang-Up" you could stop an existing connection.

With the button „State" the state of the connection is displayed at the lower side of the dialog.

8.3.4.3 Extra
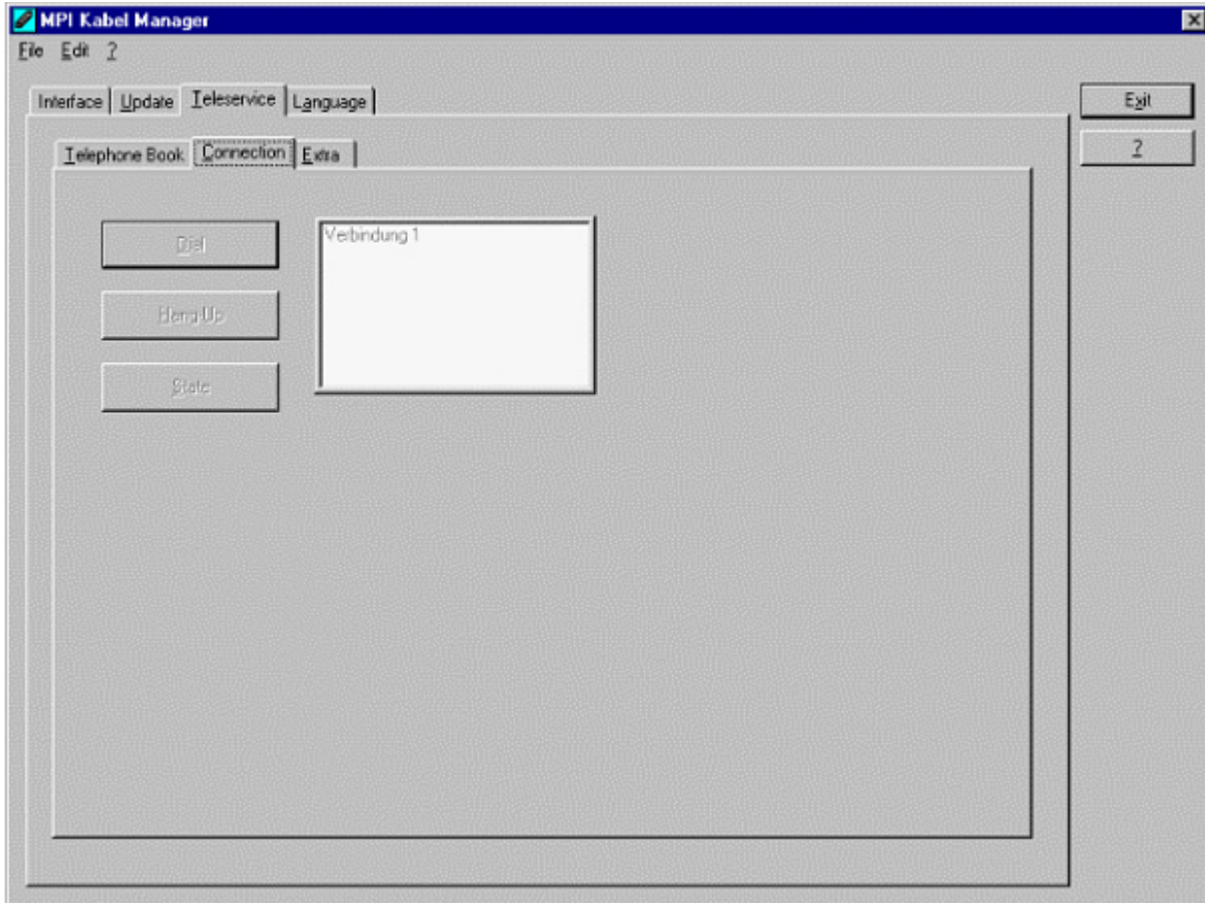
In this dialog, all configuration to the TS-adapter is done.

The actual state of the MPI-cable is displayed right of the button "TS-function", where the follwing 4 possible Messages could apear:

„TS-Adapterfunction is NOT activ. To activate press TS-function"
The MPI-cable acts like an PC-Adapter. There will no answer for TS-spezific protocols, the attached modem will not initialized and the baud-rate to the PG/Modem is not fixed. The baud-rate is detected automatically.

„TS-Adapterfunktion is ACTIVE. To disable press TS-function"
The MPI-cable acts like an TS-Adapter. There will an answer to TS-spezific protocols, the adapter could now configured. An attached Modem will be initiliazed and the baud-rate to the modem is fixed.

„SNDERR" or „RCVERR"
There is a communication error at sending or recieving data from the mpi-cable. Disconnect the MPI-cable from the power supply (PLC). Change to the tab Connect and after that back to Extra. If the problem remains, check the connection to the MPI-cable, especially the COM-port in the dialog interface.

With the buttons you could define which modem is used, activate or disable the TS-function or configure the TS-adapter:

8.3.4.3.1 „Setup"

In the follwing dialog you could choose the used modem.
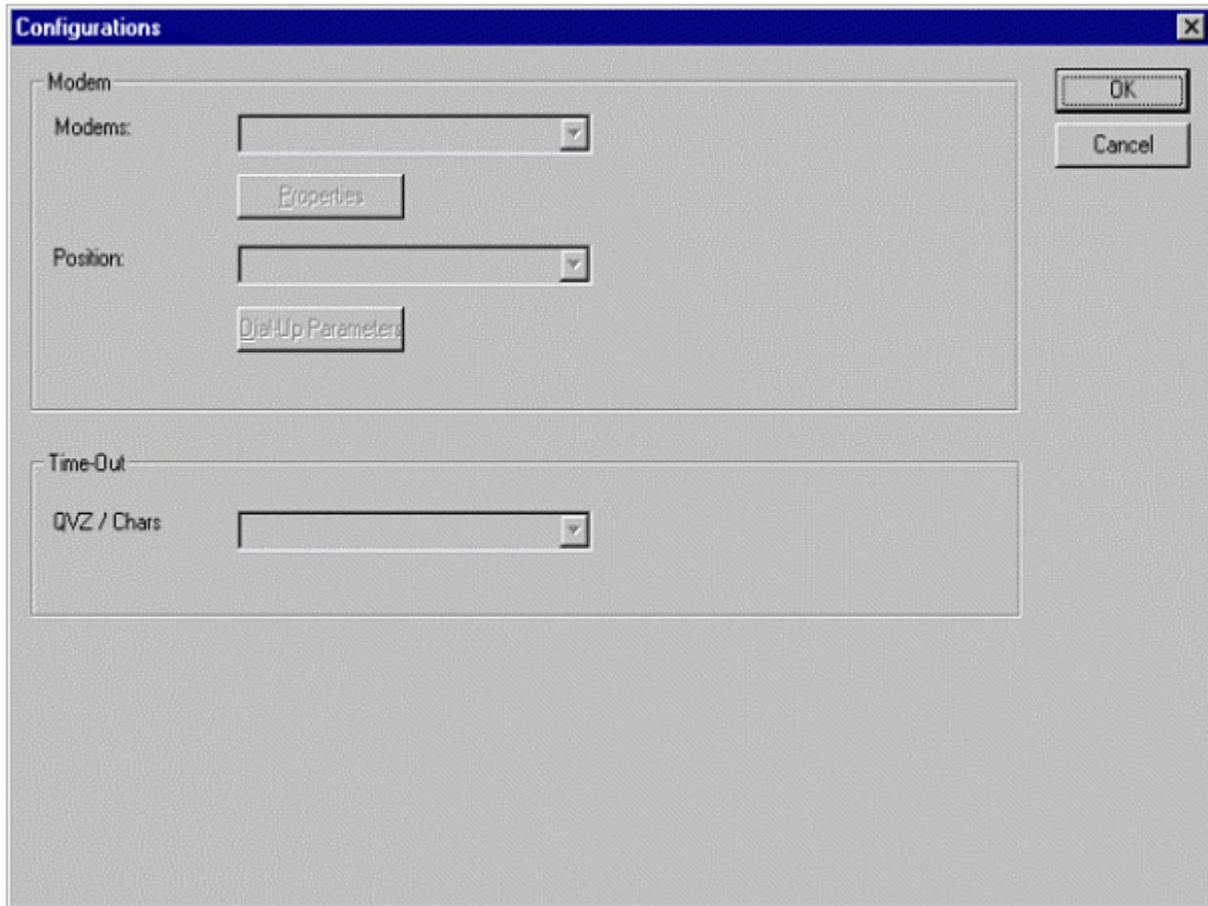
8.3.4.3.2 „TS-function"

With this button you select the function of the MPI-cable as TS- or PC-adapter. Right of this button the actual state of the MPI-cable is displayed.

8.3.4.3.3 „configure adapter"

In the following dialog you could, after activating the MPI-cable as TS-adapter, configure the TS-spezific setup.

Network

station related:

Here you can configure following:

The TS-Adapter is the one and only master in the MPI-bus

Which local station-address is used for the TS-Adapter. Please consider that a programming device has normally the number 0, operator panel have 1, PLC's use 2, FM/CP's 3 etc.

Please: Never use the same station-number for 2 different stations!
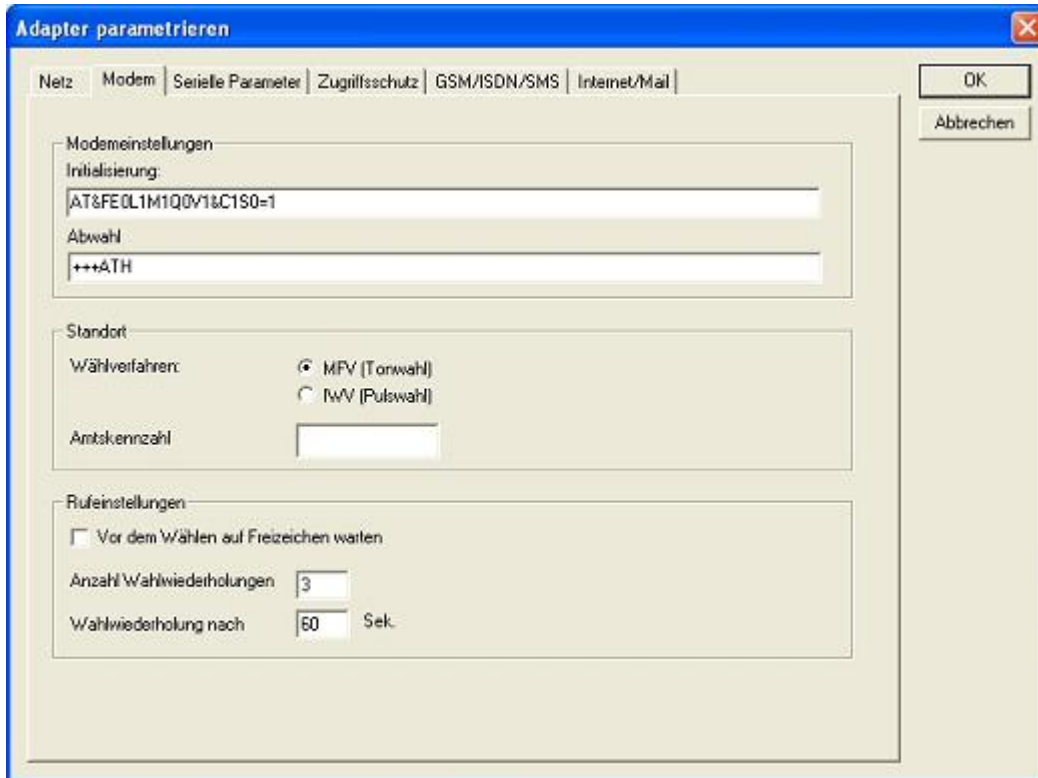
network related:

Here you can configure following:

The Nettype MPI or PROFIBUS

The transfer-speed on the MPI-bus

The highest station-address in the bus (the less you use, the more performance on the MPI-bus, must be corresponding with the configuration in the PLC's)

Modem

In this dialog you could configure the modem-related setup.

The Init-String is composed out of several commands to the modem:
AT ⇒ start command
&F ⇒ use factory settings
E0 ⇒ Echo off
L1 ⇒ loudness of speaker is low
M1 ⇒ speaker is on at connection
Q0 ⇒ output of the return values
V1 ⇒ return values plain text
&C1 ⇒ DCD shows status of the carriersound
S0=1 ⇒ automatic connection after 1 ring

The Hang-Up-String is composed of 2 elements:
+++ ⇒ Change to command-mode
AT ⇒ start command
H ⇒ Hand-Up connection

There are 2 possible calling technics:
MFV tone, the telphone-number is transfer by several frequencies
IWV pulse, the telephone-number is transferred with the count of several pulses on the line

When you must a pre-call to establish a call outside your company, you could define it at Official number.

When the modem should wait for a free line, so you should set the corresponding checkbox.

At number of retries you could configure the number of retries for a connection before the call is stopped.

When using a retry you could choose the seconds which the application should wait between calls.

Serial parameter

In this dialog the transfer-rate between modem and TS-Adapter is selected.

The transfer-rate could choosen between the follwing values:
2400, 4800, 9600, 19.2k, 38.4k, 57.6k and 115.2kBaud

The Parity could be chosen, but this is modem-dependant because some modems could not transfer the parity-bit:

None: (There is no parity testing)
Odd: (The number of one-bits are odd)
Even: (The number of one-bits are even)

Password

The Access over a telephone-line on the PLC could be configured in this dialog.

The Administrator could change the configuration over a telephone line, where an 2 User could not change the configuration.

The User-Name is maximal 8 Chars long.Every user and the administrator could use a password which is used to log into the PLC over a telephone-line. These have to enter for each new call.

After 3 wrong retries the connection is hanged up, so you must call again (Not so with an original TS-adapter).

After changing the password for one user/administrator you must re-type it again correctly before it is used.

In call-back-number you could define a telephone-number which is used for call-back from the TS-adapter. After you connect with the TS-adapter, you are asked for your user-name and password. When the correct password and user-name is transfered, the connection is hanged-up and the TS-adapter is calling back this configured call-back-number.

GSM/ISDN/SMS

Analog modem:

You could choose the Location of the Modem.

ISDN modem:

Type: Choose the type of the ISDN-network switch:

AT&T 5ESS
Nothern Telecom DMS-100
EuroISDN NET3 (Standard)
INS64
US NI-1
VN4

Protocol: Choose the transfer-protocol-type:

Modem like
V.120
X.75 (Standard)
ML-PPP
SoftBonding
HDLC
CLEAR

DN/MSN: Directory Number resp. Multiple Subscriber Number Is used for both ISDN-channels. When using the number 255 no DN/MSN is used.

GSM modem:

Adapter parametrieren

Netz | Modem | Serielle Parameter | Zugriffsschutz | **GSM/ISDN/SMS** | Internet/Mail

OK
Abbrechen

GSM
PIN [   ]

Refresh | nicht registriert: KEIN EMPFANG

GPRS
APN Server [internet.eplus.de]
APN Username [eplus]   APN Passwort [eplus]

Fehlerauswertung
Modem bereit
....
....

SMS
SMS [NEIN ▼] TS [0] CPU [255] Mw [254] DB [65535]

Dienstanbieter 1 [MAIL ▼] [   ] [KEIN ▼]
Dienstanbieter 2 [MAIL ▼] [   ] [KEIN ▼]
Dienstanbieter 3 [MAIL ▼] [   ] [KEIN ▼]
Dienstanbieter 4 [MAIL ▼] [   ] [KEIN ▼]
NTP-Server [nt6p0.fau.de]

PIN: PIN-Number of the SIM-Card, up to 8 numeric chars, (only for TELE-SERVICE GSM).

Provider: With the button „Provider" the provider could be choosen. Reading of the list of providers could be elapse more than a minute. At end the possible provider are listed for selection. With „Automatic" the GSM-Modem tries to connect automatically to a provider. On the right side of the button, the actual used selection is displayed.

Display Description:

Automatic: The provider is automatically searched and selected from the GSM-modem.
Manual: The Provider is selected manually from the GSM-Modem
no network registered: No connection to the GSM-network, the receive-quality is too bad
set format: The format of the provider is set
Manual/automatic: The modem tries to select manually the provider, if this fails an automatic search is done
unknown: Unknown response from GSM-Modem

Refresh:
The button „Refresh" reads from the Modem the receive quality, the quality is displayed.

Display Description:
Unknown: Unknown state of the GSM-network
no registration: The modem is not registered in the GSM network, no provider found
registration denied: Registration in the GSM-network is denied
Search network: In Search for a GSM-Provider
GSM: Attached to GSM
GSM(ROAMING): Attached to GSM, but with a Roaming-Partner. This could lead to high costs!

The Receive Quality is displayed, also as value together with the bit-error-rate.

Value Description:

99 No network, no receive

00 Very, very bad receive-quality
01 Very bad receive-quality
02 to 09 Bad receive-quality
10 to 17 Medium receive-quality
18 to 25 Normal receive-quality
26 to 30 Good receive-quality
31 Best receive-quality

Messages:

The possible error conditions for the modem, mpi-bus-problems or other problems are displayed in this text-field. Firstly, the modem-related information is shown:

Message

- Modem ready
- Modem error
- No answer from modem
- Modem detects ring
- End of connection
- connected via modem line
- No dialtone detected
- Phone-line or telephone busy
- Phone-number is blacklisted in modem
- Phone-number delayed. Access denied for 1 minute.
- Fax-call detected
- Data-call detected
- unknown error
- The selected direct-access-number not configured
- The configured PIN-Number is wrong for the inserted SIM-Card
- The SIM-Card is not or wrong inserted or the SIM-Card is a 5V Type

Following the possible MPI-Bus error-messages

Message

- MPI/Profibus-Configuration erroneous
- Timeout at MPI/Profibus detach from device.
- The local station-address is used twice in the MPI/Profibus.
- A20/M20/TC35 Modem operation
- The MPI/Profibus is not correctly configured
- The HSA is not configured optimal
- The MPI/Profibus-Baudrate is not detectable
- Overflow in the internal MPI-Readbuffer
- Overflow in the internal LAN-Readbuffer
- Overflow in the serial Buffer
- The selected MPI/Profibus-Baudrate is wrong
- Overflow in internal LAN-Writebuffer
- LAN-Receive-Error
- LAN-Send-Error
- The PD-Number is wrong
- The transferred SAP is wrong/unknown
- ErrCode 01: The Destination address (XXX) of a State protocol > 127 detected. In the MPI/Profibus-

Bus there are no stations possible which station number is greater than 127. (FC=YYh)

- ErrCode 02: At state-protocol the Source-Address is detected as 127. This is the Broadcast-address which is not possible.
- ErrCode 03: The received State protocols destination address (XXX respectively YYY) does not exist in the MPI-Bus. (FC=ZZh)
- ErrCode 04: The function-code (YYh) of the received State protocol from XXX is incorrect. The 7th Bit is High, but according to the specification the Bit has to be low.
- ErrCode 05: A State protocol has been received. But the function-code (YYh) means that the participant is not ready to enter the bus.
- ErrCode 06: The function-code in the State-protocol received from XXX is unknown (FC=YYh)
- ErrCode 11: The sender (XXX) of the received data-protocol is unknown. To send data the participant must get the Token. (SSAP=YYh, FC=ZZh, length=UUU)
- ErrCode 12: Data-protocol with Source-address 255 (Broadcast) is useless. (CPU=XXX, SSAP=YYh, FC=ZZh, length=UUU)
- ErrCode 13: The sender (XXX) of the received data-protocol is unknown. To send data the participant must get the Token. (SSAP=YYh, FC=ZZh, length=UUU)
- ErrCode 14: The 7th Bit of the function-code is High, but according to the specification the Bit has to be low. (CPU=XXX, SSAP=YYh, FC=ZZh, length=UUU)
- ErrCode 15: The upper 4 Bit of the Function-code are wrong/unknown) (CPU=XXX, SSAP=YYh, FC=ZZh, length=UUU)
- ErrCode 16: Unknown function-code has been transmitted to the cable. (CPU=XXX, SSAP=YYh, FC=ZZh, length=UUU)
- ErrCode 17: Destination-SAP are defined till 3Fh in data-protocols. (CPU=XXX, SSAP=YYh, FC=ZZh, length=UUU)
- ErrCode 18: Source-SAP are defined till 3Fh in data-protocols. (CPU=XXX, SSAP=YYh, FC=ZZh, length=UUU)
- ErrCode 19: Received a data-protocol with destination-SAP=0, Connection request from another bus-participant with our cable. (CPU=XXX,SSAP=YYh,FC=ZZh,DSAP=UUh)
- ErrCode 1A: Participants are sending data to our cable with source-SAP = 0, which means that the participant has not made a connection establishment or has lost the negotiated SAP. (CPU=XXX,SSAP=YYh,FC=ZZh,DSAP=UUh)
- ErrCode 1B: Data-protocol with unknown data-function-code received. (CPU=XXX,SSAP=YYh,FC=ZZh,DFC=UUh)
- ErrCode 1C Data-protocol with unknown data-function-code received. (CPU=XXX,SSAP=YYh,FC=ZZh,DFC=UUh)
- ErrCode 1D: Received a state-protocol with error-code. (CPU=XXX,FPGA=YYh,RAM=ZZh)
- ErrCode 1E: FPGA has caused an interrupt although no data present. (SD1=XXh,SD1=YYh,CPU=ZZZ,FC=UUh)
- ErrCode 20: Unknown protocol at PPIMultimaster-Mode. (FC=XXh,Länge=YYY)
- ErrCode 21: Unknown baud-rate at PPIMultimaster-Mode. (Baudrate=XXh) After that additional hints are displayed.

SMS:

SMS: Switches Processing OFF / Only Receive / Only Send / Receive and Send.

Attention: before setting ON check configuration, after activating the device will go into the MPI-BUS and tries to connect to the defined PLC. Receive of SMS only with TELESERVICE-GSM Receive of DTMF only with with TELESERVICE GSM

TS: local station-address (should not be used twice in the MPI/Profibus!)

PLC: from this station-address the Flagword and Data-block is accessed for communication

MW: communication-flagword (the first byte is the command, the second is the state). Use even operand-addresses.

DB: communication-data-block.

Provider 1/2/3/4: Configure the SMS-Provider to use, including type, phone-number and char-code.
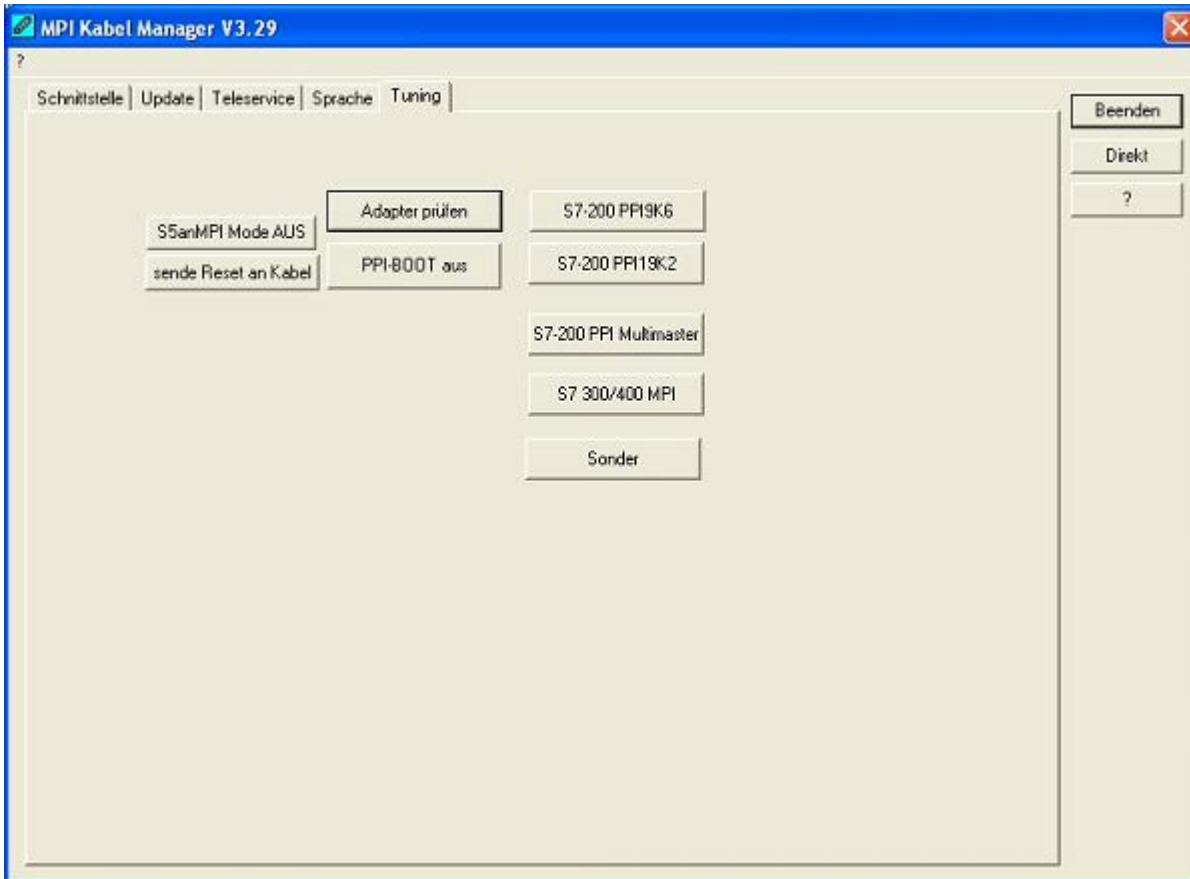
Internet/Mail

8.3.4.3.4 „Import parameter"

With this button you could import the parameter from an ASCII-file. This file is compatible to the original file-format.

8.3.4.3.5 „Export parameter"

With this button you could export the parameter to an ASCII-file which has the same file-format as the original.

8.3.5 Tuning

This tab is only used in some special cases. If you press the button „Check Adapter" the cable is connected und after that the following dialog is displayed:
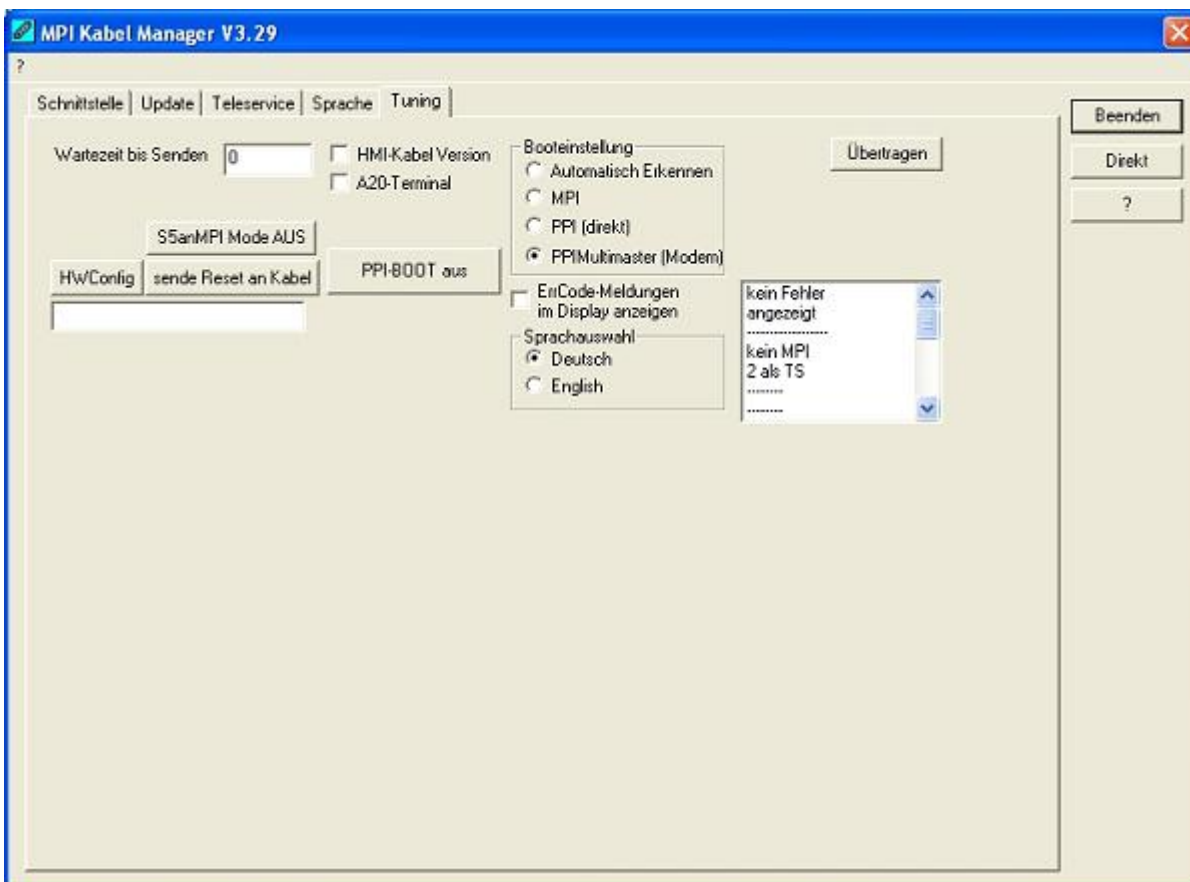
There are the following configuration possible, they will be transferred to the MPI-Cable by pressing the button „Transfer". The configuration is saved permanently in the Flash-ROM:

Time to send:

At ProTool RT the communication could break down, because the MPI-Cable is transferring the answer-protocol to fast. In this property you could insert a time in 0.1ms ticks. Insert at first 300, to great values are preventing the communication.

HMI-Cable-Version:

Some Touch-panels have the problem, that when they get a wrong version-information they never retry to connect (and then the correct version is transferred). In this case the HMI-version-information could be transferred immediately.

A20-Terminal:

When using the A20 or M20-Terminal, the control-lines on the serial port are not used. In that case the tele-service-function is not working. With this property the control-lines are no longer used and therefore the A20/M20 can communicate over tele-service.

Bootconfiguration:

Normally the MPI-Cable automatically selects the correct bus-type, no changes are needed. In special-cases the MPI-Bus could be selected as PPI.

For example: This application and the PLC are powered on at the same time. The application is communicating immediately with the cable, the PLC is booting, in this case the MPI-Bus is not driven. The MPI-Bus is erroneous, so no communication is starting.
If this occurs you could choose, that the cable is working as MPI-Adapter only..

Language:

You could select the language which is used from the cable (German or English).

9 PLC-VCOM

9.1 Description

It creates a new, virtual com-port in your system, with which the programming software of your PC (such a. PG 2000, Step© 5/7, S5/S7 for Windows, WinCC, Microwin) can communicate with the device

The PLC-VCom application is needed for use with the following devices:

• MPI-LAN Cable– Art. No.. 9352-LAN
• S7-LAN Modul – Art. No.. 9352-LANCon
• MPI-USB Cable– Art. No.. 9352-USB
• S7-USB Modul – Art. No.. 9352-S7-USB
• MPI-II Cable (USB – mode) – Art. No.. 9352 + 9352.1
• S5-LAN Modul – Art. No.. 9359-LAN
• Tele-Service (as programming adapter) – Art. No.. 9377-(ANALOG/ISDN/GSM)-OP

By installing the PLC-VCOM adiconalmente were installed the **S5-LAN** and the **MPI-LAN.** Both offer the possibility to manage the network configuration of your products

9.2 Installation

1. Download the PLCVCom from the product-page of your MPI-product and start the installation.

2. After choosing language the welcome dialog appears in the chosen language. Click "Next" to define the installation path (see right picture). This can be done with a click "Browse…" If you are ready press "Next" to go on.


3. In the next dialog you can choose the program folder for your start menu.
Go on with "Next".

9.2.1 USB driver installation using Windows NT/2000/XP

This part of the description is for the operating systems Windows NT/2000/XP.If you are using Windows 98SE or ME please read the description „Final configuration of the PLC-VCOM".
4. This driver is only required for USB devices such as MPI-USB/MPI-II/S7-USB.
Connect this your MPI-USB cable to your computer.
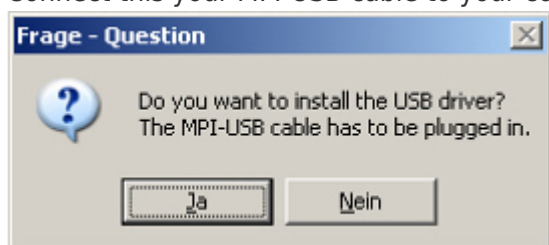
5. "Yes" to start the driver installation. "No" to skip the driver installation and go directly to the" Final configuration of the PLC-VCOM".
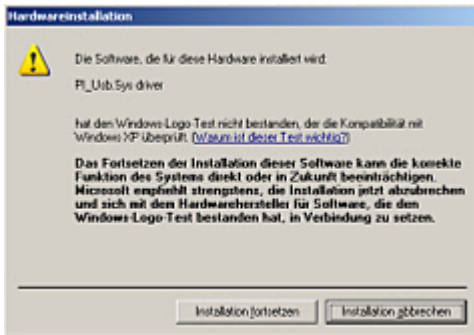
6. On Windows XP this dialog appears while installation (see left picture). It is the "Windows Driver Qualifying Question". Press "continue installation" to go on.


7. After the driver has been installed, please disconnect your MPI-USB Cable and than connect it again. This loads the new installed driver. "OK" to go on.

9.2.2 Final configuration of the PLC-VCOM

8. Choosing the COM – Port Already occupied COM port can be viewed in Windows Device Manager if you are not sure which COM ports are still available.

If you are not sure which port is unused, press "OK". Later you can start this dialog again by clicking in the application folder of your start menu on "SelectCOM".
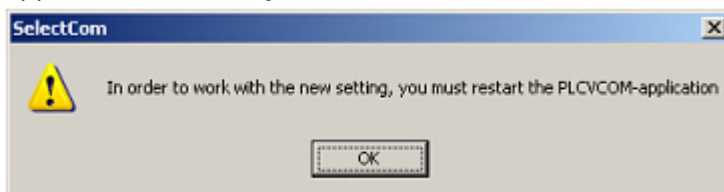
9. The installation ends with a click on "OK".

9.2.3 USB driver installation using Windows 98SE/ME)

After you have finished the installation of the PLC – VCom software (Step 9 and 10) you now have to install an USB driver. Therefore the software PLC – VCom must be installed. Otherwise the needed driver file is not available.

This driver is only required for USB devices such as MPI-USB/MPI-II/S7-USB.

10. Plug the cable into the USB port of your computer and wait until the automatical hardware recognition starts . Alternative: „Control panel - Hardware".

11. The "hardware assistent" wants you to install the "USB < - > Serial" driver. Click on "Next" to configure the driver search. 12. Choose in the next dialog "Search for the best device driver (recommended)" and click on „Next"..

13. Activate the checkbox "Set the driver position:" and deactivate all the others. Click on "Choose…" and choose the path where the PLC – VCom software is installed. Confirm your configuration with "OK" and click on "Next".
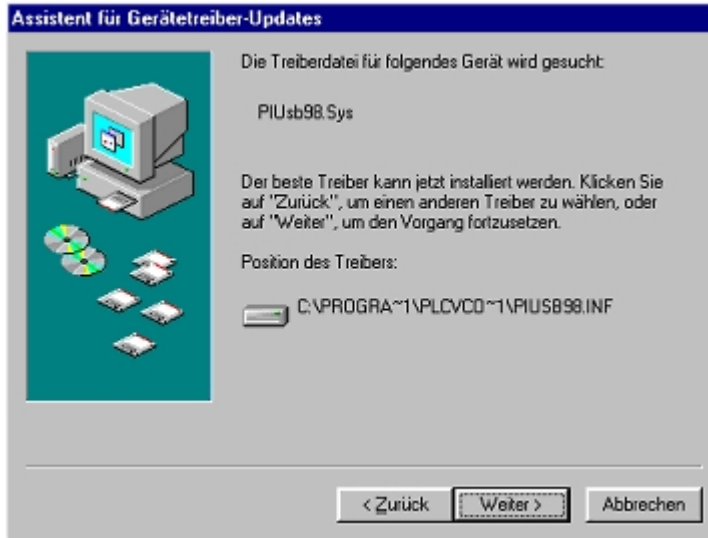
14. Now the "Hardware - Assistent" should show a dialog which is equal to the picture below. Click on "Next" to start the installation.

15. After the installation finished successful click on "Ready" to end this installation.

16. The installation is finished successfully after you have restarted you system.

The virtual COM-Port is only view-, select- and accessible when the PLCVCOM is in the „connected" state, that means a cable is present and usable.

9.3 Overview

Beside your watch, in your Windows – Taskbar, appears a new Symbol. This one is for the PLC – VCom software.

It shows the actual connection status with your cable/module MPI-II, MPI-USB, MPI-LAN, S7-USB, S7-LAN or S5-LAN.

9.3.1 Status description:

	PLC – VCom is connected with your cable/module and operational.
	PLC – VCom is not connected.
	The red symbol indicates that sending/receiving data has been failed. Send status: (left field): Data is send to the cable/module if this one is green.
	Receive status: (right field): Data is received from the cable/module if this one is green.

9.3.2 Main Window

1. Configuration: Select and open the configuration program for your products.
⇒ PLC-VCOM: Management, connection and communication with the cables
⇒ S5-LAN: configuration of your S5-LAN modules
⇒ MPI/S7-LAN: Configuration of your MPI-LAN or S7LAN

2. Info: information about the PLC-VCOM and your computer.

3. Status: Display the connection parameters of the cable connected.
⇒ Top left: shows the name of the currently connected product
⇒ semi-left: shows the connection status
⇒ half right: shows the IP address of the connecting cable
⇒ Top right: Click here to search or select a device
⇒ right middle: name of the connected cable
⇒ bottom right: displays information about current computer connections

4. Virtual Port: Display of selected virtual COM ports and
the program that the last has accessed on this COM port.

5. Program: Buttons to adjust the PLC-VCOM
⇒ Exit. This button closes the program and the COM – Port
⇒ Lenguage: Switch the Language to english/german.
⇒ Help: opens the Help menu of the PLC-VCOM, when they should have problems or questions
⇒ "Minimize" the dialog. This button does not close the program. It just minimizes the program. You will
find the PLC – VCom symbol in the Windows – taskbar beside the watch.

9.3.3 Configuration window

1. List of available cable / modules:
⇒ Linewise display of the products found with your properties

2. IP-Adress:
⇒ IP address and MAC address of the selected cable / module

3. Via network card:
⇒ Selection of the used network interface card

4. LAN-Type:
⇒ Selection of the be connected cable / Module Types

5. Several check boxes:
⇒ Manual entry: allows you to enter the parameters manually

⇒ no network: for products which are not in any network

⇒ Installing in the device Manager: Installs the PLC-VCOM COM port in Device Manager
(required only for S7 for Windows and S7 Doctor software)

⇒ RFC1006: activation of RFC1006 communication method

⇒ no network card selection: Passes the routing of packets to the operating system

⇒ serial interval times: slow down the serial transmission eg panel transfers

6. Search
⇒ With a click on Search you are sending an broadcast to every cable/module that is connected with your network or your system. Every responding cable/module will be inserted to the list.

7. Help:
⇒ opens the Help menu of the configuration, if they have problems or questions

8. OK:
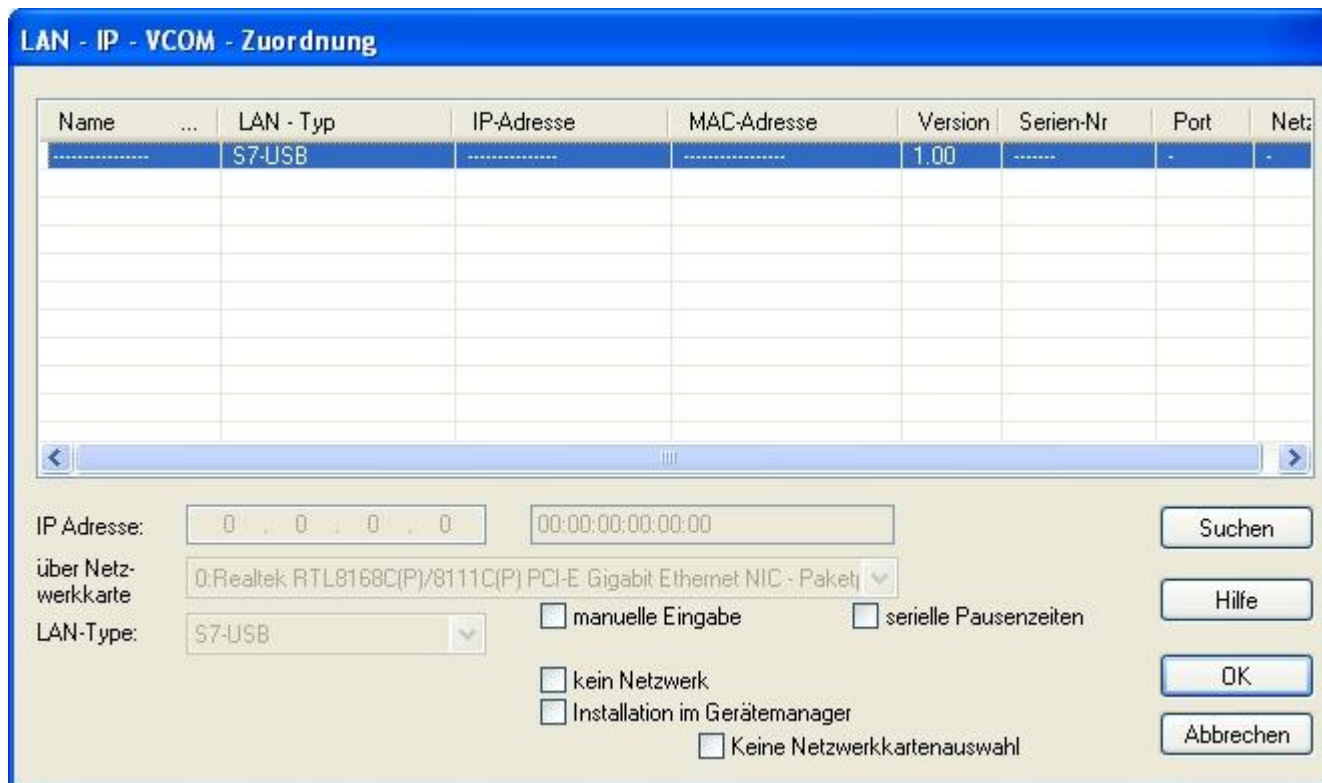⇒ Ends the PLC-VCOM configuration and accepts the entered / selected settings

9. Cancel:
⇒ Ends the PLC-VCOM configuration and discards the entered / selected settings

9.4 Configuration

1. Start the PLC – VCom application, if this is not already running.

2. Open the PLC-VCOM by clicking on the icon ⊠ PLC-VCOM in the system tray.

3. After the PLC-VCOM is open, click in the status area on the "Configure" and the wizard to configure is launched.

9.4.1 S7-USB

9.4.1.1 Automatically

1. With a click on "Search" you send a broadcast to all cables and modules that are located on your network or directly connected to the computer. Each reacting cable / module to this broadcast is entered in the list of participants.

2. Select the desired cable / module so that it is highlighted in blue.
Here, all parameters are automatically included in the configuration wizard.

9.4.1.2 Manually

The manual entry relates to the network users that are behind routers in other networks because the broadcast for the automatic detection is not passed from routers and these network devices thus can not be found. This point is not to be observed for USB devices, because these are all connected directly to the computer.

9.4.1.3 Final settings

3. Select the options that you may need, eg RFC1006,
no network card selection, installation in the device manager or serial breaks.

Information about the options which can be selected and deselected with the help of checkboxes, can be found in section "Overview" of the PLC VCOMs.

4. Confirm your entry / selection with "OK".
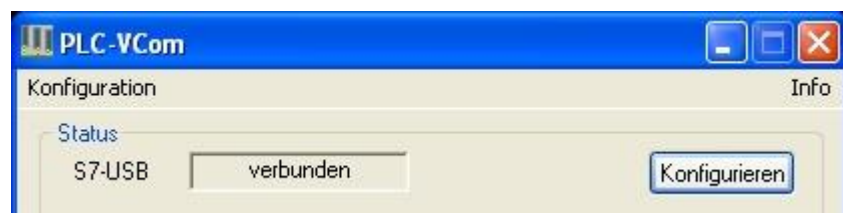
5. After a successful connection, in the main window of the PLC VCOMs appears the cable type with which the computer connects and the connection status is "connected".

6. Finally click "Minimize" to decrease the PLC-VCOM in the notification area, so that this can continue to manage the virtual COM port.

10 Technical data

Supply voltage:	5V/DC
Power consumption:	2 watt
Display:	2 status-LEDs
Handling/Configuration:	Kabelmanager-Software Interfaces: to the PLC: PPI/MPI/Profibus
interface:	9,6 KBd - 12 MBd to the PD/PC: PD/diagnosis jack Mini-USB-B-Buchse Galvanic separation: 1000V PPI/MPI/Profibus to the PC
Operating temperature:	5 - 55°C
Case:	ABS-plastic case
Dimensions:	65 x 43 x 17 mm

10.1 Pinning Mini-USB-jack

Pin No.	Short name	Notation	Direction
1	Vcc	Power supply (DC)	Input
2	D –	Dataline –	Bi-directional
3	D +	Dateline +	Bi-directional
4	ID	Not connected	Not connected
5	GND	Signalground	Input

Attention:

Do not lengthen this side. This side leads also 5V/DC power supply and this will decrease the quality of the signals (maximum allowed cable length is 5 m).

A longer cable would decrease the signal quality of the bus and cause several errors in the transmission!

10.2 Pin assignment

Pin No.	Notation	Designation	Direction (of cable)
1	NC	Not Connected	
2	M24V	Ground of the 24V	In

Pin No.	Notation	Designation	Direction (of cable)
3	Ltg_B	Data line B	BiDir
4	RTS-AS	Request to Send from the PLC	In
5	M5V	Ground of the 5V	In
6	P5V	5V output	Out
7	P24V	24V Supply input	In
8	Ltg_A	Data line A	BiDi
9	RTS-PG	Request to Send to the PLC	Out

Note

The shield is attached with the MPI/PPI connector via the shield of the adapter casing. To find directly attended PLC´s , RTS-AS and M5V must be connected in the cable. P5V means a output of the cable and works only as an output for a bus-termination with resistors. This 5V output doesn't drive any load and have a 100R resistor inside his direction.

observe:

Don't lengthen the connection by a 1:1 cable to the PLC, because there are 24V and 5V inside of the cable. The quality of the bus-signal will be risen down!

To lengthen the connection, please use a MPI-NETZ-Adapter and connect only the signals Ltg_A and Ltg_B 1:1 and the shield at both sides of the metal-casing at the SUB-D connector

For an extension of the cable please supply the cable with external power and only prolong the signals Ltg_A and Ltg_B 1:1. Connect the shield on the SUB-D connector, possibly include a termination resistors (on the bus-END).

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