compatible with you

SSW7-TS PRO ISDN

700-770-8IS41

User Manual

Edition 1 / 15.12.2008

HW 1-1-3 and FW 4.01 and higher

Order number of manual: 900-770-8IS41/en

Systeme Helmholz **GmbH** • Hannberger Weg 2 • 91091 Großenseebach

Phone: +49 9135 7380-0 • Fax: +49 9135 7380-110 • E-Mail: info@helmholz.de • Internet: www.helmholz.de

Note:

We have checked the content of this manual for conformity with the hardware and software described. Nevertheless, because deviations cannot be ruled out, we cannot accept any liability for complete conformity. The data in this manual have been checked regularly and any necessary corrections will be included in subsequent editions. We always welcome suggestions for improvement.

Revision history of this document:

Edition	Date	Revision
1	15.12.2008	First edition

Contents

1 Safety Information

For your own safety and for the safety of others, always heed the safety information given here. The safety information indicates possible hazards and provides information about how you can avoid hazardous situations.

The following symbols are used in this manual.

Caution, indicates hazards and sources of error

Gives information

Hazard, general or specific

*Danger of **electric shock***

1.1 General

The SSW7-TS PRO ISDN is only used as part of a complete system.

The operator of a machine system is responsible for observing all safety and accident prevention regulations applicable to the application in question.

During configuration, safety and accident prevention rules specific to the application must be observed.

Emergency OFF facilities according to EN 60204 / IEC 204 must remain active in all modes of the machine system. The system must not enter an undefined restart.

Faults occurring in the machine system that can cause damage to property or injury to persons must be prevented by additional external equipment. Such equipment must also ensure entry into a safe state in the event of a fault. Such equipment includes electromechanical safety buttons, mechanical interlocks, etc. (see EN 954-1, risk estimation).

Never execute or initiate safety-related functions using an operator terminal.

1.2 Restriction of access

Only authorized persons must have access to the modules!

The modules are open equipment and must only be installed in electrical equipment rooms, cabinets, or housings. Access to the electrical equipment rooms, barriers, or housings must only be possible using a tool or key and only permitted to personnel having received instruction or authorization.

1.3 Information for the user

During configuration, safety and accident prevention rules specific to the application must be observed.

This manual is addressed to anyone wishing to configure, use, or install the SSW7-TS PRO ISDN.

The manual tells and explains to the user how to operate the SSW7-TS PRO ISDN. It provides the installing technician with all the necessary data.

The SSW7-TS PRO ISDN is exclusively for use with a S7-300/S7-400 programmable controller from Siemens.

The SSW7-TS PRO ISDN is for use within a complete system only. For that reason, the configuring engineer, user, and installing technician must observe the standards, safety and accident prevention rules applicable in the particular application. The operator of the automation system is responsible for observing these rules.

1.4 Use as intended

The SSW7-TS PRO ISDN must only be used as a communication system as described in the manual.

1.5 Avoiding use not as intended!

Make sure in the software that uncontrolled restarts cannot occur.

Safety-related functions must not be controlled via the SSW7-TS PRO ISDN alone. Make sure in the software that uncontrolled restarts cannot occur.

Before you start installation work, all system components must be disconnected from their power source.

2 Installation and Mounting

Installation and mounting must be effected in compliance with VDE 0100 / IEC 364. Because it is an IP 20 module, you must install it in a cabinet.

A maximum ambient temperature of 60 ºC must be ensured for reliable operation.

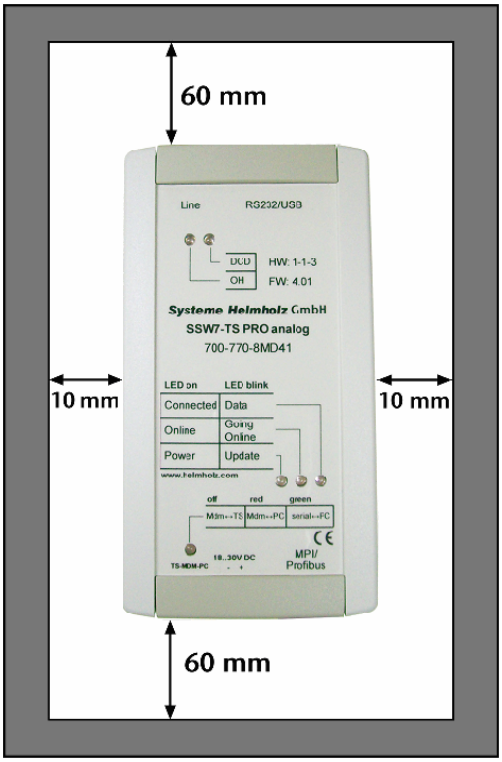
2.1 Mounting orientation

The SSW7-TS PRO ISDN can be installed in any orientation.

2.2 Minimum clearance

Minimum clearances must be observed because

- then it is possible to insert and remove the SSW7-TS PRO ISDN without having to remove other system components.
- there is enough space to connect existing interfaces and other contacts using standard commercial type accessories.
- there is room for any necessary cable routing.



For the SSW7-TS PRO ISDN, a minimum clearance of 60 mm must be left above and below and 10 mm at the sides.

2.3 Installing the module

For mounting on level surfaces or on DIN mounting rails, the wall and rail holders supplied can be used.

This is clicked onto the rear of the housing without the use of tools.

3 System Overview

3.1 Requirements for the ISDN connection

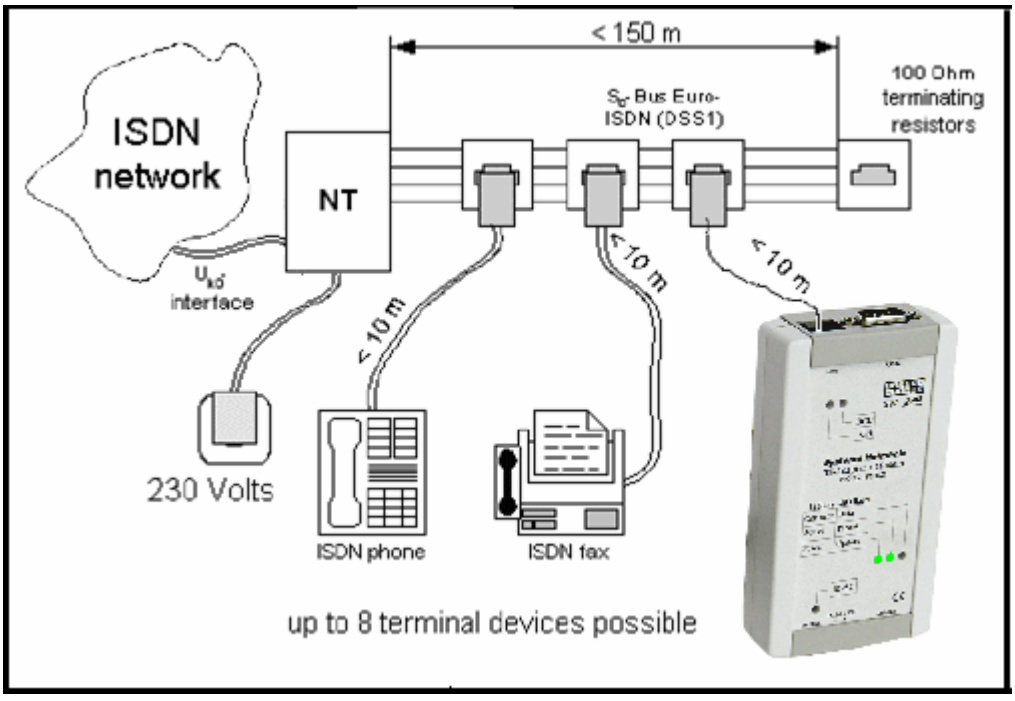
The SSW7-TS PRO ISDN can be operated either on a point-to-point or on a point-to-multipoint ISDN connection. A point-to-multipoint ISDN connection means that multiple ISDN subscribers can be reached with multiple telephone numbers. In Germany, a maximum of ten telephone numbers is available per network termination unit.

In the as-delivered state, the internal ISDN modem is set to the point-to-multipoint ISDN connection. This means that this digital terminal generally has to be assigned its own number. This is called the MSN (abbreviation for Multiple Subscriber Number).

In general, the MSN is the part of the telephone number without the area code. In practice, the MSN is the extension number to the desired connection, and is therefore usually a two- to three-digit number.

The MSNs can be distributed flexibly amongst the terminals.

Example of a point-to-multipoint connection



!

An external S_0 bus is required.

Only one ISDN terminal can be used on each point-to-point ISDN connection. The terminal type can be set with the HSComm software supplied. If the SSW7-TS PRO ISDN is to be used in an existing telephone exchange, first ascertain whether an external S_0 bus is available for the SSW7-TS PRO ISDN. Many of these exchanges internally use bus type U_{P0}, which is incompatible with the conventional S_0 bus and manufacturer specific. It may be necessary to install an additional S_0 module in order to make an external S_0 bus available for the SSW7-TS PRO ISDN!

3.2 Application and function description

The SSW7-TS PRO ISDN is a gateway between the USB , RS232, or modem and a MPI or Profibus bus. It is mainly designed for teleservice of S7-300 and S7-400 CPUs and supports transmission rates of up to 12 Mbps.

The internal modem can also be used independently of the MPI/PROFIBUS functions to communicate with other systems.

The RS232 or USB interface can be used for parameter setting directly on site or for SCADA and visualization systems.

Only the RS232 interface can be directly connected with an external modem to implement remote links independently of the internal modem modules.

The additional Mini-A USB interface has priority, that is, the RS232 interface is inactive when the USB link is active.

The integrated modem of the SSW7-TS PRO ISDN modem is industry standard and supports the EURO DSS1 transmission standard.

The EURO ISDN protocol offers a transparent transmission service at 64kBit/s. It is successfully established in most EU countries and is also used outside Europe – except North America and Japan. If the equipment is destined for use abroad, please ask the telephone companies in the country of use whether the DSS1 protocol is supported.

We always recommend obtaining information about the telephone network structure from local network providers in advance if equipment is destined for use outside Europe.

Up to eight MPI/PROFIBUS links can be used simultaneously with the USB, RS2323, or modem link.

At the MPI/PROFIBUS end, the baudrate to be used is automatically detected. On the USB and RS232 interface, the baudrate of the connected workstation is also automatically detected.

The SSW7-TS PRO ISDN draws the power it required either from the MPI/PROFIBUS interface of the programmable controller or via an extenral power supply (see Section 3.6).

The MPI/Profibus connecting cable has a 9-way SubD connector and is 1.2 meters long and active. A repeater is installed in it so that the connected SSW7-TS PRO ISDN is not a spur line that could cause interference on the bus.

Using the null modem cable supplied, the SSW7-TS PRO ISDN can be used for parameterization on site via a serial interface on the programmable controller.

With the appropriate software, it is possible to use the SSW7-TS PRO ISDN as

- A programming adapter (TS or PC adapter),
- Teleservice unit, or
- Operator control and monitoring unit

!

An active USB link automatically deactivates the RS232 interface!

!

FMx modules cannot be parameterized with the SSW7-TS with ISDN modem.

!

The functions "PG-Dial" and "AS-Dial" for starting a call from an S7-CPU are not implemented.

All further information can be found in the manual for each programming software product.

An update of the firmware can be transmitted to the SSW7-TS PRO ISDN both locally and via a remote link.

3.3 Connections

The SSW7-TS PRO ISDN has the following connections:

- Power supply socket for input of 24 V DC.
  This power supply option can be deployed if the automation system used provides no or only an inadequate power supply at the bus connector.
- RJ11 socket for connecting the corresponding telecommunication cable.
- RS232 connector for connecting the null modem cable supplied for direct operation as a programming adapter or use of the internal modem. Not active while the USB is being used.

!

The power cannot be drawn from the USB interface!

- USB Mini A socket as an alternative connection
- Bus connector with programming unit socket, switchable terminating resistor, and 1.2 m connecting cable. The programming unit socket of the bus connector allows further bus nodes to be plugged in.
  The terminating resistor must be set to ON if the SSW7-TS PRO ISDN is at the beginning or end of a bus segment. If this is not the case, the switch position must be OFF.

3.4 LED displays

For display of the operating status, the SSW7-TS PRO ISDN has six LEDs. One LED is implemented in two colors.

3.4.1 Status LEDs for standard functions

The three LEDs *"Power," "Online,"* and *"Connect*" provide information about whether and how the SSW7-TS PRO ISDN and MPI/PROFIBUS bus are functioning.

They also indicate an update process.

State of the LEDS	Power LED (green)	Online LED (green)	Connected LED (green)
Ready for operation	ON		
Actively logged on to the MPI/PROFIBUS bus	ON	ON	
Active connection with a programmable controller	ON	ON	ON
Data exchange with a programmable controller	ON	ON	BLINK
Transferring firmware update	BLINK	OFF	OFF

3.4.2 Status LEDs for modem functionality

The two LEDs *"DCD"* and *"OH"* indicate the status of the integrated modem.

LED status for operating status	DCD LED (orange)	OH LED (orange)
Call/telecommunication link is switched through		ON
ISDN connection established. Modem ready for transmission of useful data	ON	ON

3.4.3 Status LED for operating mode display

The LED *"TS/MDM/PC"* indicates which of the three possible modes, the SSW7-TS PRO ISDN is currently in.

LED status for operating status	LED (green)	LED (red)
The internal TS adapter is connected to the internal modem (microswitch setting *"TS"*). The USB and RS232 interface is inactive	OFF	OFF
The internal TS adapter is connected to the USB/RS232 interface (microswitch setting *"PC"*). The internal modem is inactive.	ON	OFF
The internal modem is connected to the USB/RS232 interface (microswitch setting *"MDM"*). The internal TS adapter is inactive.	OFF	ON
The internal modem was not correctly initialized by the SSW7-TS PRO (e.g. incorrect AT command).	OFF	BLINK
The externally connected modem was not correctly initialized by the SSW7-TS PRO (e.g. incorrect AT command).	ON	BLINK

3.5 Function switch

3.5.1 Microswitch TS adapter

The *"TS/MDM/PC",* which is located on the underside of the housing next to the external voltage socket, is used to switch between the three possible operating modes.

- In switch position *"TS",* the SSW7-TS PRO ISDN functions directly with the integrated modem.
  This enables the SSW7-TS PRO ISDN to be used for teleservice using the Teleservice software (see Section 5.2).
  The USB/RS232 interface does not have a function in this switch position.
- In switch position *"PC",* the SSW7-TS PRO ISDN functions directly with the USB or RS232 interface.
  The SSW7-TS PRO ISDN can be operated on the local computer as the TS adapter or as a PC adapter (Auto/MPI/PROFIBUS) (see

!

The USB interface has priority, that is, the RS232 interface is inactive when the USB link is active.

Section 5.1).
The modem is inactive in this switch position.

- In switch position *"MDM",* the internal modem functions directly with the USB or RS 232 interface.
  In this way, the modem can be directly addressed via the USB/RS232 interface, for example, to parameterize it or to use it for teleservice purposes unconnected with MPI/PROFIBUS (see Section 5.3).
  The SSW7-TS PRO ISDN cannot perform MPI/PROFIBUS functions in this switch position.

3.6 Items supplied

The scope of supply of the SSW7-TS PRO ISDN includes:

- SSW7-TS PRO ISDN ready to use
- DIN rail adapter
- 2-meter 5-way USB 2.0 A/Mini-B cable
- 3-meter null modem cable
- 3-meter RJ11 connecting cable
- 24V plug-in element, 2-way, max. 1.5 mm² flexible with front connection
- Manual (German/English)
- CD with driver, parameterization tools, additional information

3.7 Accessories

3.7.1 Manuals

Manual, German	900-770-8IS41/de
Manual, English	900-770-8IS41/en

3.7.2 Software

S7/S5 OPC server with software license	800-880-OPC10
S7/S5 OPC server with USB dongle	800-880-OPC20

3.7.3 Miscellaneous

DIN mounting rail adapter as an accessory	700-751-HSH10
Power supply adapter with plug Input: 100-240 V AC / 47-63 Hz / 400 mA Output: 24 V DC / 625 mA	700-751-SNT01

4 Installation of the driver software and service tools

The CD supplied contains various drivers and service tools that have to be used for their respective purposes.

4.1 System requirements

To operate the driver and service tools of the SSW7-TS PRO ISDN, a PC or laptop is required with a 32-bit Windows operating system and a CDROM drive. The Windows 2000, Windows XP, and Windows Vista operating systems can be used.

In the programming devices or PCs used, there should be one USB interface with the USB 1.1 or USB 2.0 specification. As an alternative, the RS232 interface can be used in conjunction with a standard COM port. Commercially available RS232 interface cards installed in the PC can also be used for this.

4.2 Installation of the USB driver

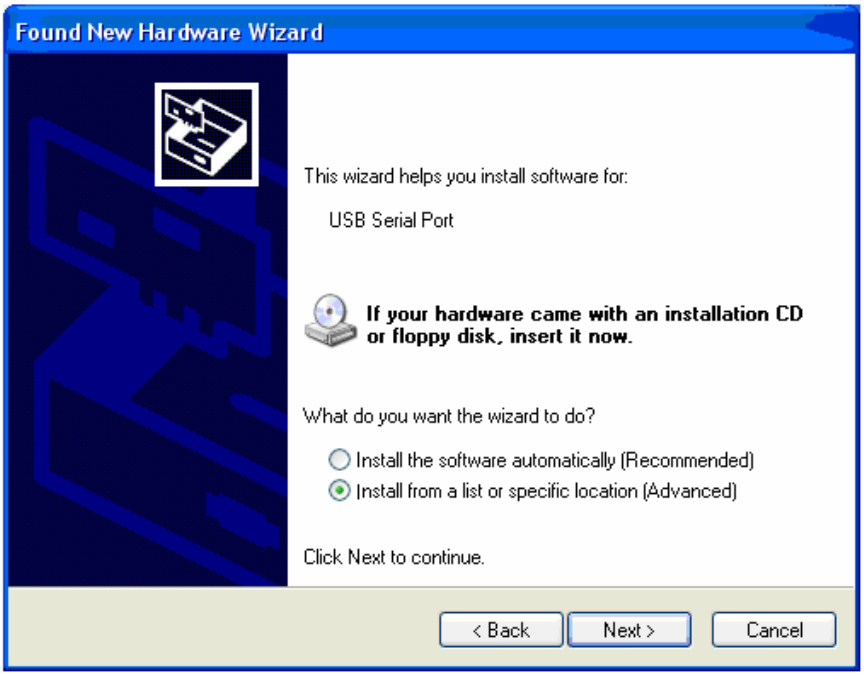
If this is the first time a SSW7-TS PRO ISDN is being connected to the PC via USB, the operating system will try to install a suitable driver. The driver is a sort of interface between the USB interface and the operating system (Windows) and has nothing to do with the actual application.

The USB driver is required for subsequent parameterization of use of the SSW7-TS PRO ISDN on the local computer (not necessary for operation on a serial COM port).

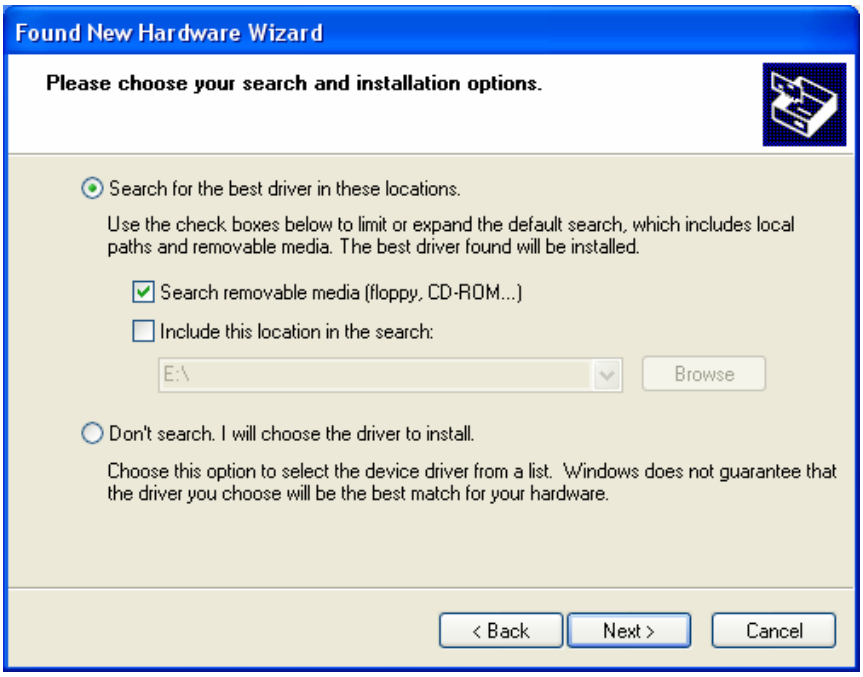
This initialization can take a little time and goes through the following steps:

- The operating system starts an installation wizard that performs the installation, which is largely automatic.
  In the first step, you must enter whether the driver is to be searched for online or locally.

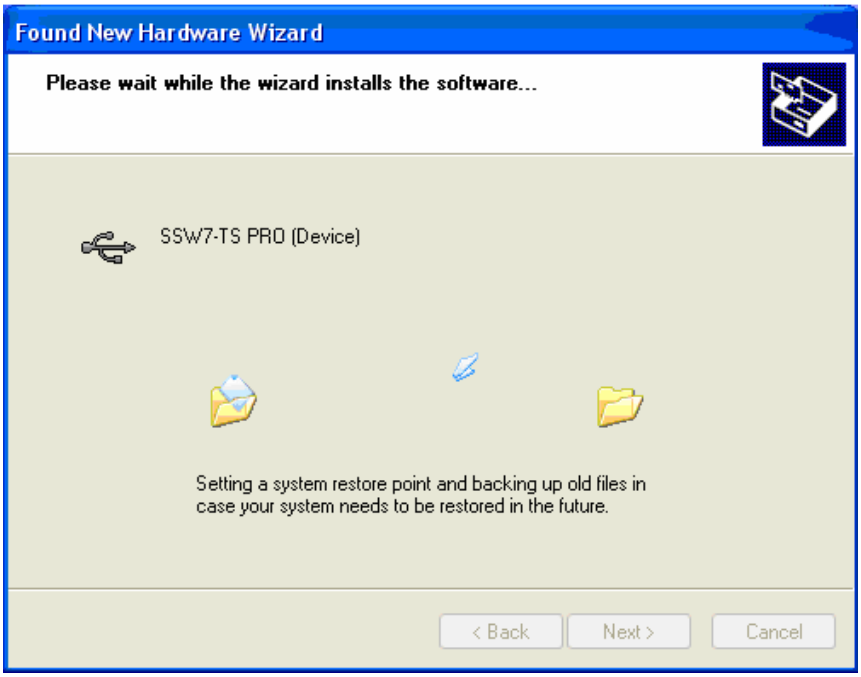
- To be able to specify the search path for the driver (generally the CD supplied), it is necessary to make the following setting and confirm it with "*Next.*"



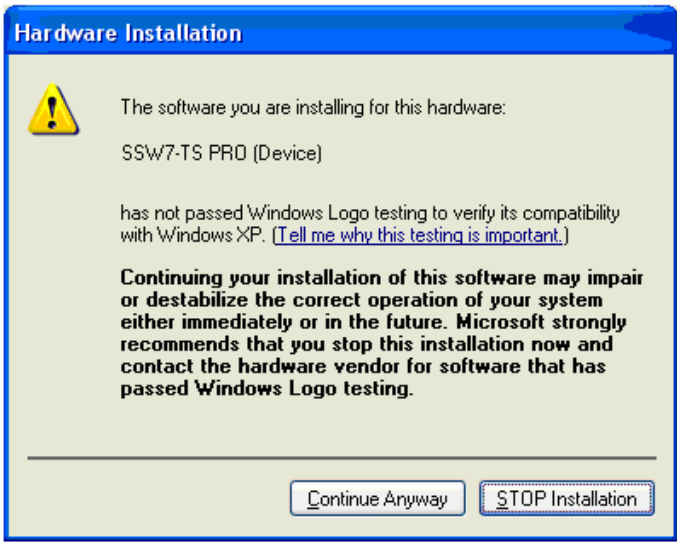
- The next step is a prompt to specify the location of the driver. It is generally enough to set a checkmark next to *"Search removable media..."* and then to click the *"Next"* button.



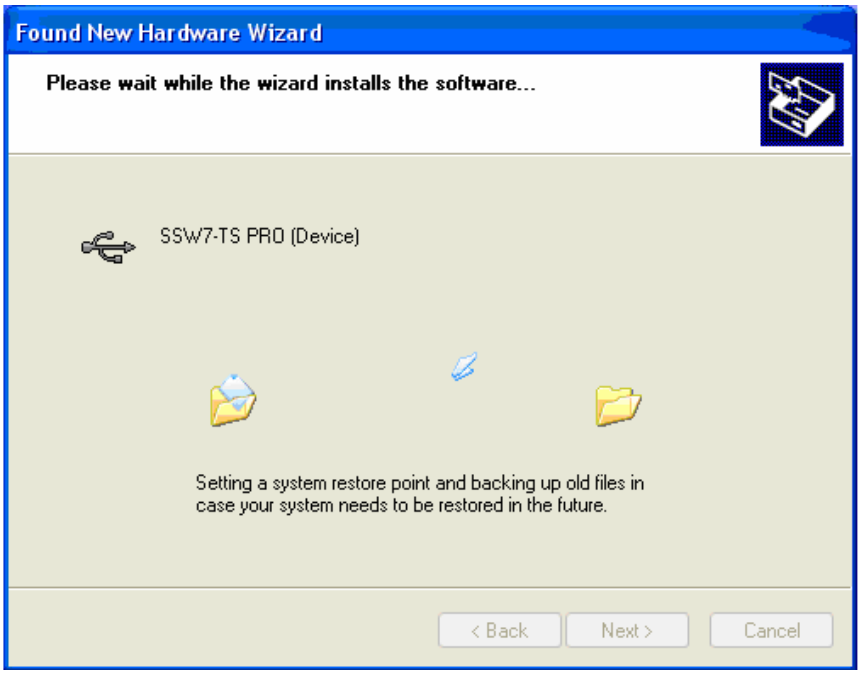
- If the SSW7-Teleservice-Modem CD is in a local drive, the search for the driver now begins.



- If the driver is found, a Windows XP logo compatibility query appears.

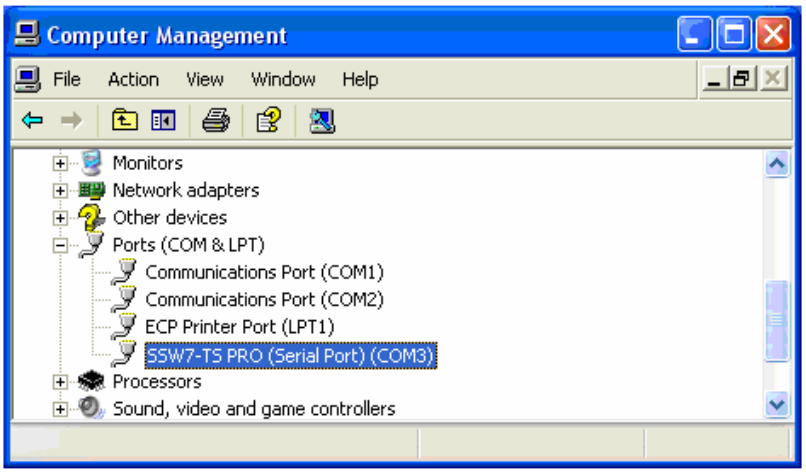


- Confirm with the button *"Continue installation."* The driver is then installed.



- After successful installation, the operation is completed by clicking the "*Finish*" button.

- The operating system starts the installation wizard a second time to install the virtual COM port driver, too. The installation routine is identical to that described above.
- A new COM port is now added in the device manager. This must be selected as the type of access for all further applications.



If several USB interfaces are available, but the SSW7-Teleservice-Modem CD is not at hand, we recommend copying the driver files onto the local hard disk because it is possible that a separate instance of the driver for the SSW7-TS PRO ISDN has to be installed on the PC for each USB interface.

4.3 Installation of the modem driver

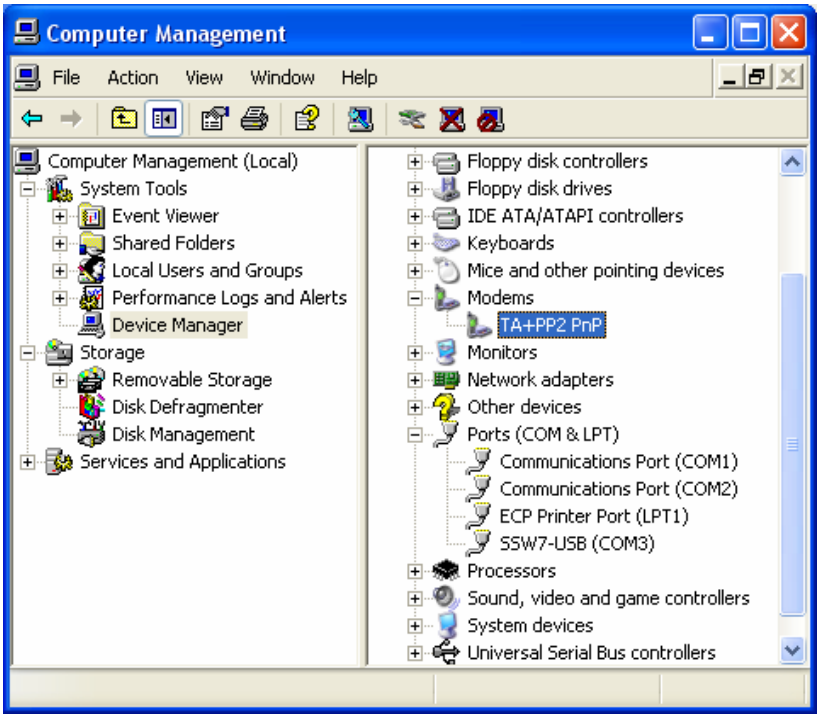
If the modem of the SSW7-TS PRO ISDN is to be operated directly on a programming device or PC via USB or RS232, the corresponding modem driver must be installed. For this purpose, the

microswitch must be put in the center position *"MDM"* and the corresponding communication cable (USB or null modem cable) plugged into the SSW7-TS PRO ISDN.

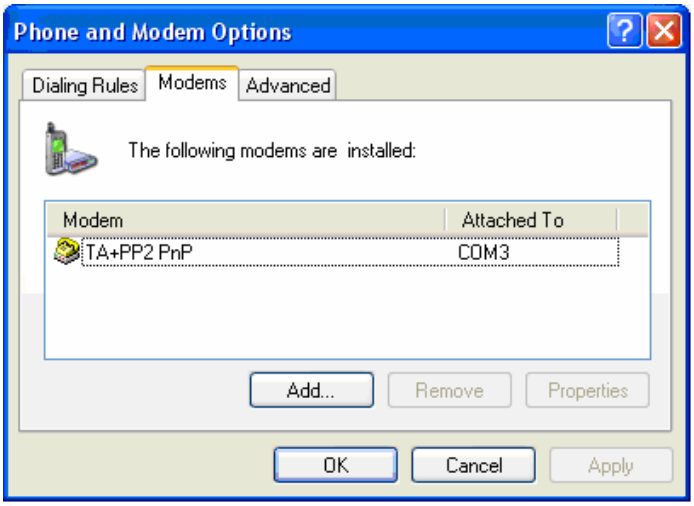
4.3.1 Autodetect

Normally, the modem is automatically recognized by the supported operating systems (Windows 2000 and Windows XP) and installed with defaults which have to be modified for teleservice.

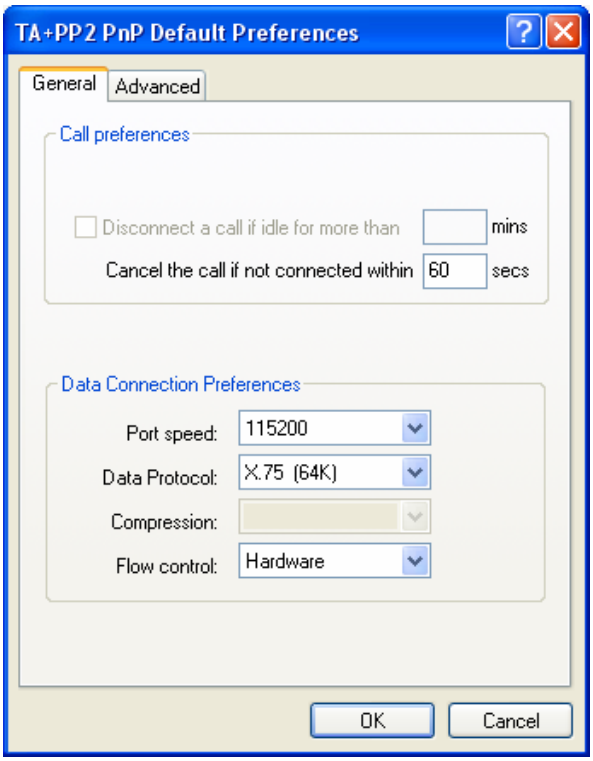
- A new modem is now added to the device manager:



- Double-click "*TA+PP2 PnP*" to open the "*Phone and Modem Options*" dialog box.



- The default protocol must be adapted to the data transmission on the "*Extended*" tab card.

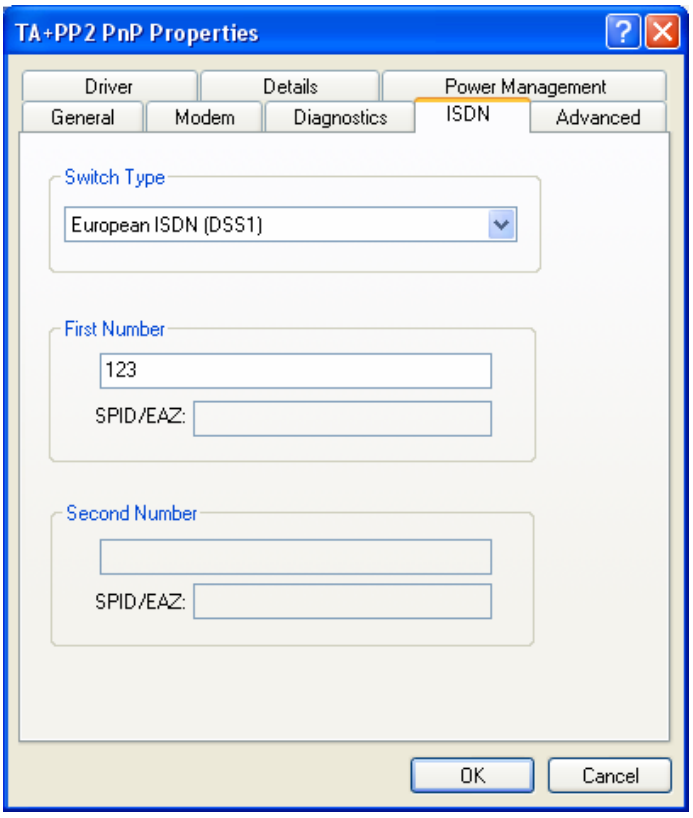


"X.75" is the standard protocol for data transmission in packet switched ISDN networks with a transmission rate of 64 kbps.

- If you confirm with "*OK*" the following message appears if no MSN entry has been made under "*First Number*":

This message appears because several B channel protocols are supported.

- In "*Phone and Modem Options*" you can select "*Properties*" to show, for example, the "*ISDN*" tab card.



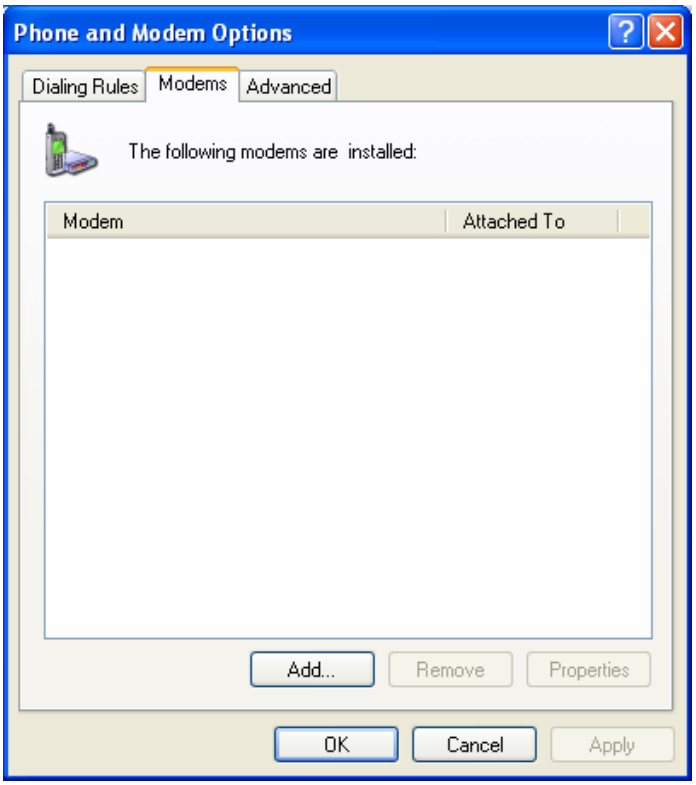
- If no free MSN is available or selection of the modem from outside is not permitted, you can ignore this message. The modem can generally make calls even if it is not assigned an MSN, but it cannot receive calls from the ISDN network.

The SSW7-TS with ISDN modem can now be used as the local modem for a telecommunication link.

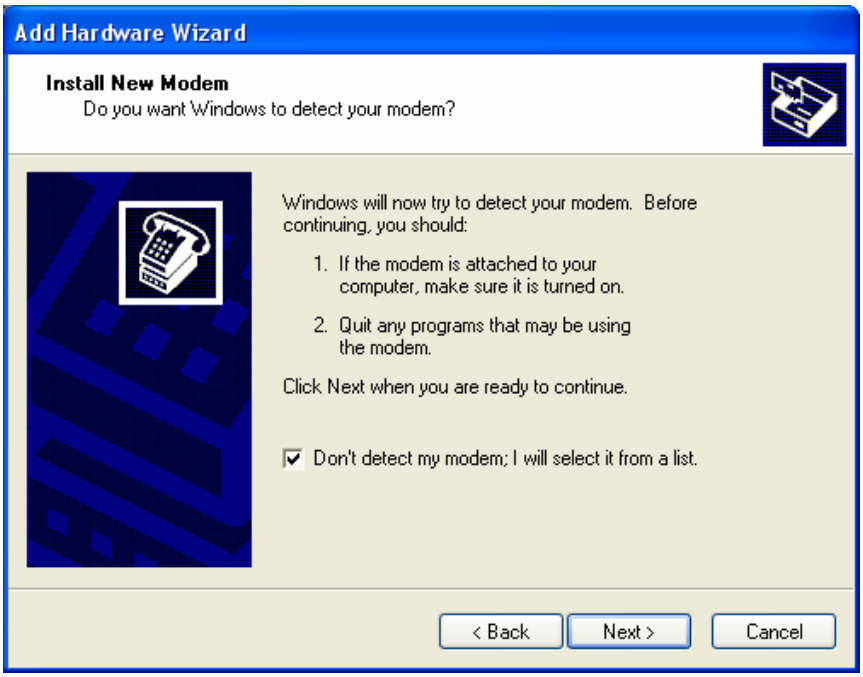
4.3.2 Manual installation

A driver is provided on the CD supplied with the SSW7-TS with ISDN modem in case the ISDN modem is not automatically detected.

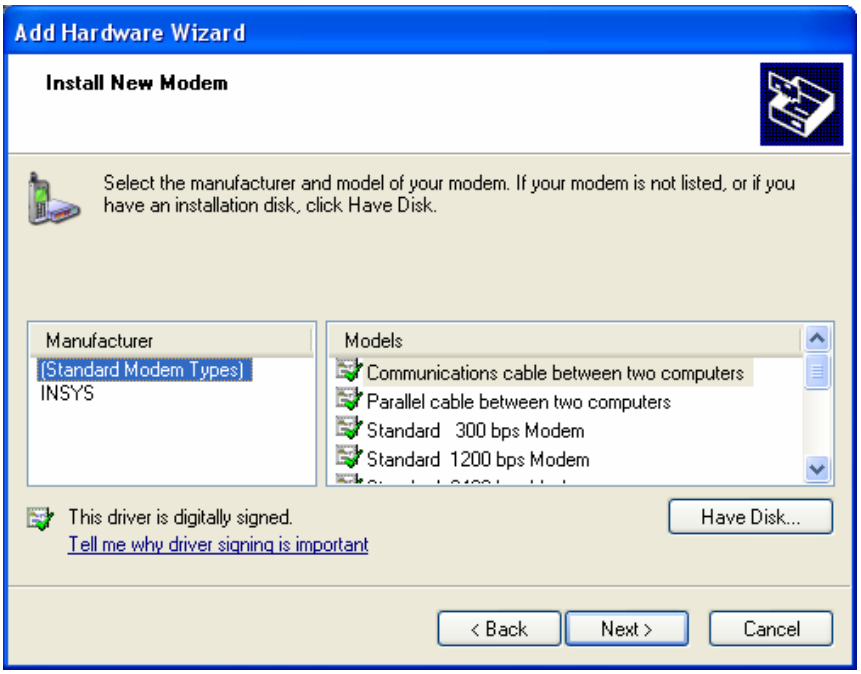
- You can open "*Telephone and Modem Options*" from the Control Panel. If the modem you require is not displayed, you must start the installation routine with "*Add*":



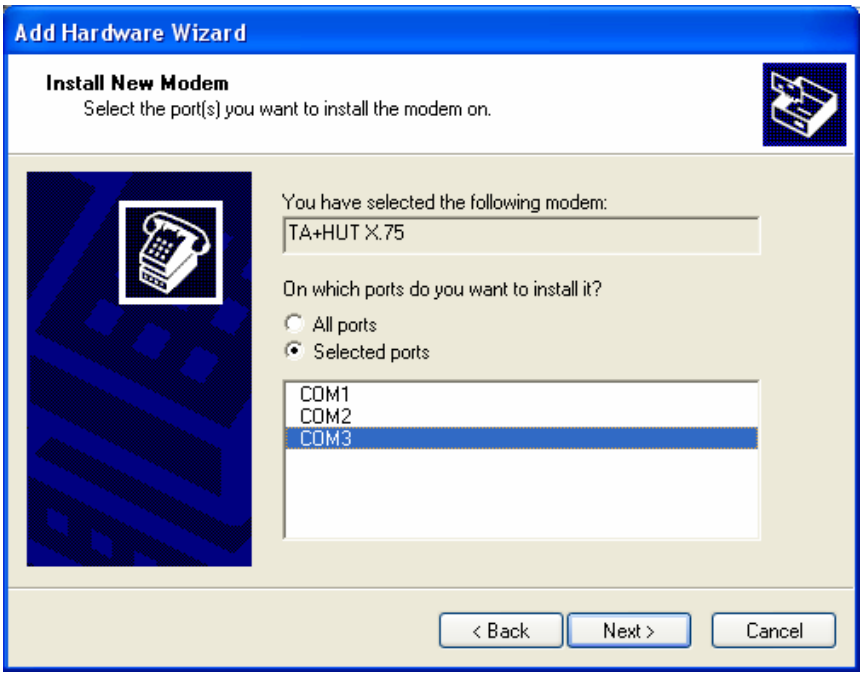
- To select the desired modem, check "*Select Modem*" in the "*Hardware Wizard*" in order to bypass automatic recognition.



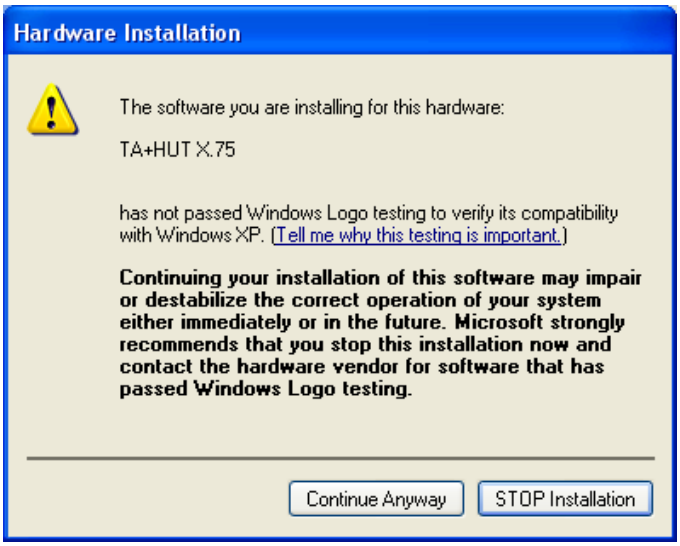
- Click button *"Have Disk*" to show the CD directory where the matching driver is located.



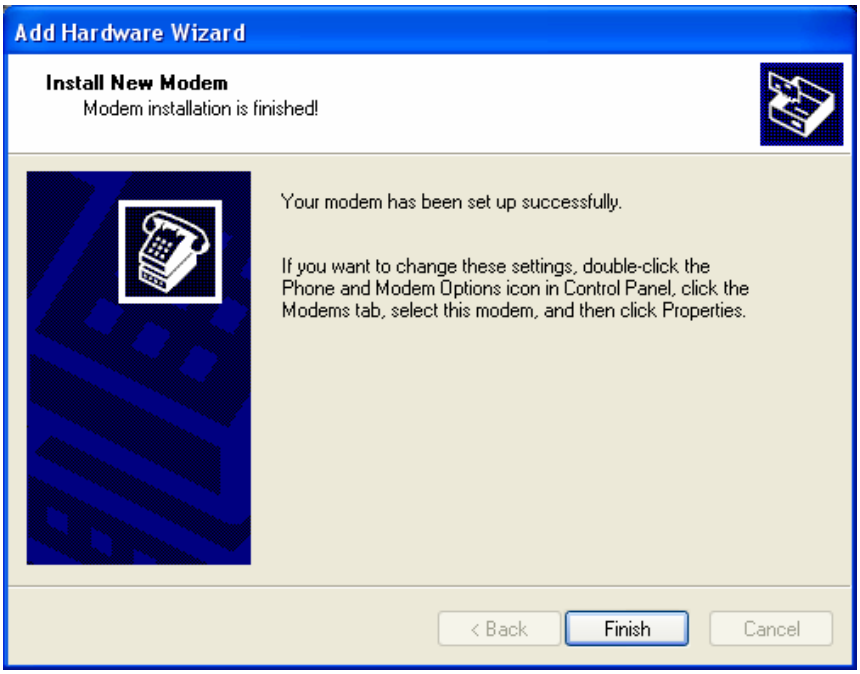
- CD directory "*cd:\driver\ISDN\Industry*" contains the file "*mdmsthut.inf*" which you select for the installation.
- The relevant COM port must be selected during installation. Here you select the COM port where the SSW7-TS with ISDN modem is connected.



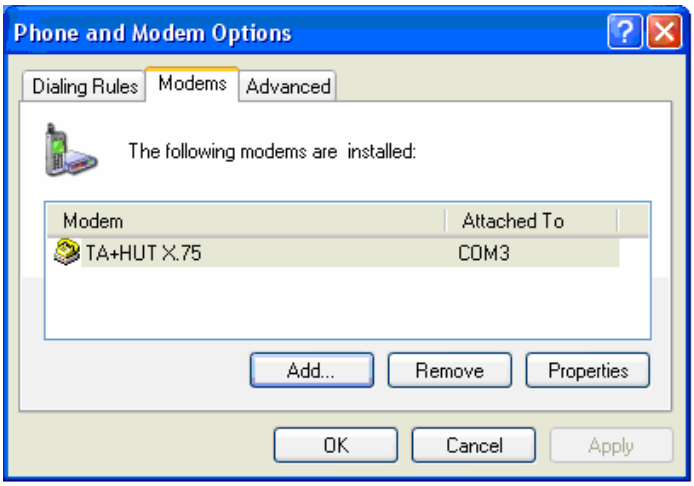
- During installation, a WindowsXP logo compatibility query appears. This must be confirmed with "*Continue Installation*".



- After successful installation, the operation is completed by clicking the "*Finish*" button.



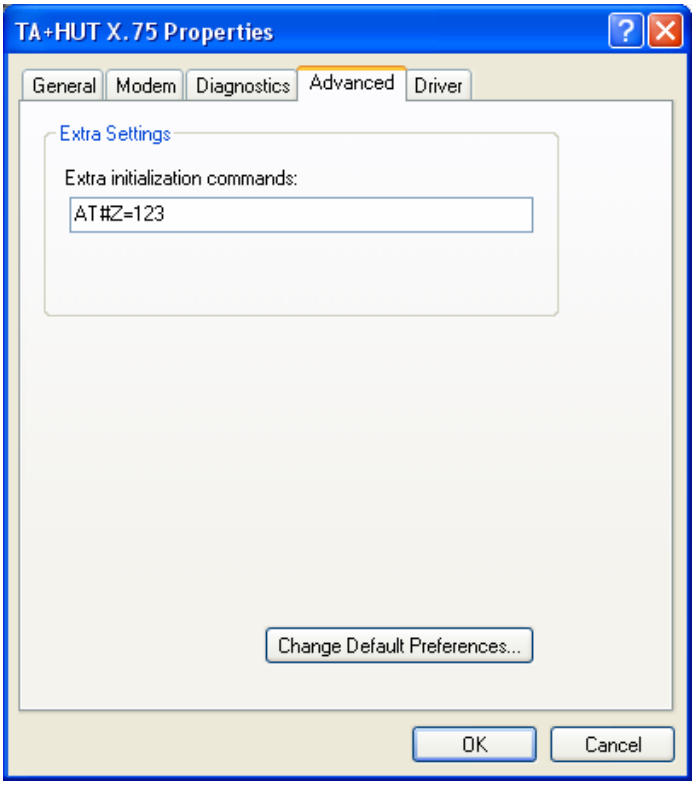
- A new modem with the corresponding COM port is now added in the "*Telephone and modem options*". Protocol X.75 is already preset in this driver.



- Click the "*Properties*" button to show the "*Extended*" tab card. Here, you can set an MSN for the modem with the AT command sequence

  AT#Z=<*MSN*>

  If this is not known, the modem does generally operate without its own MSN. However, no call-back function is possible.



!

123 is only an example in this case. The correct MSN must be entered!

The SSW7-TS with ISDN modem can now be used as the local modem for a telecommunication link.

4.4 Service tools

4.4.1 Parameterizing and updating with SHTools

With the SHTools software, it is possible to perform a system update of the SSW7-TS PRO ISDN, if required. The SSW7-TS PRO ISDN can also be pre-parameterized with SHTools without the Teleservice software having to be installed on the computer. SHTools also provides tools for using the additional functions in the SSW7-TS PRO ISDN.

The tool is freeware and has been tested under Windows 2000, Windows XP, and Windows Vista. It is included on the CD that is contained in the scope of supply.

The most up-to-date version can also be downloaded in the Internet under http://www.helmholz.de.

After installation, SHTools is available in the start menu under "*Start/Programs/Systeme Helmholz.*"

The most important program functions are described below.

4.4.2 Firmware update

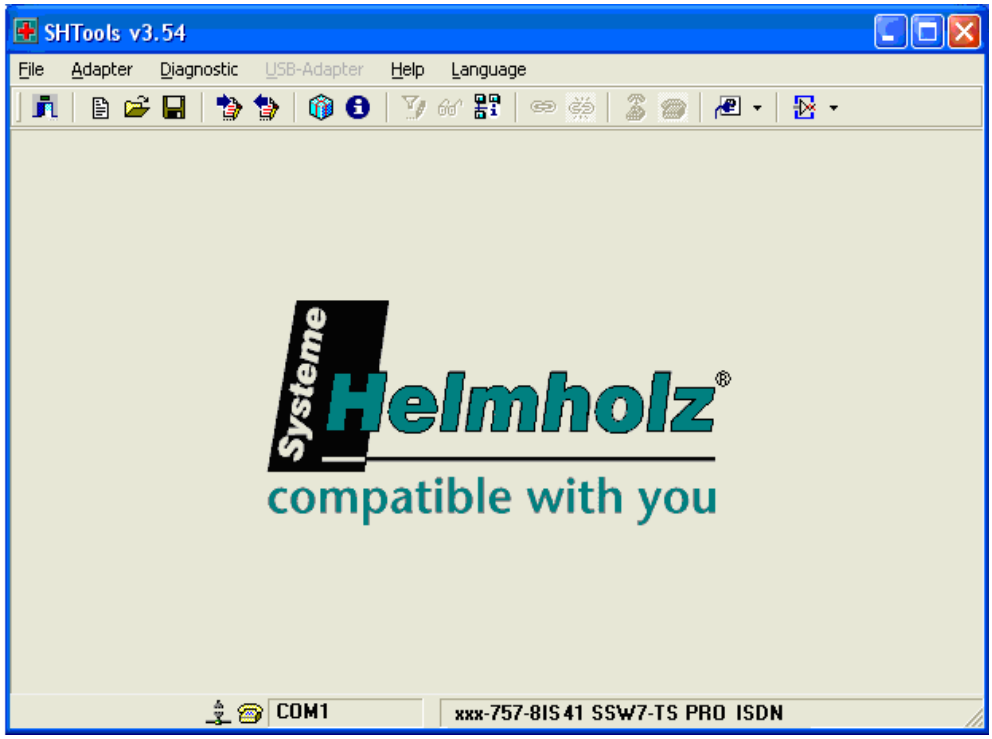
If required, it is possible to update the operating system of the SSW7-TS PRO ISDN locally or via modem link.

For the local update, a link must be established between the SSW7-TS PRO ISDN and a USB or RS232 interface on the PC on which SHTools is installed. The micro-switch on the SSW7-TS PRO ISDN must be put into the *"PC"* position. The *"PC"* operating mode is indicated by the lit green *"TS/MDM/PC"* LED.

For the remote update of a ready-to-run SSW7-TS PRO ISDN, an ISDN modem is also required on the local computer, which is addressed via a COM port.

The SHTools contain update functions for many adapters of Systeme Helmholz GmbH.

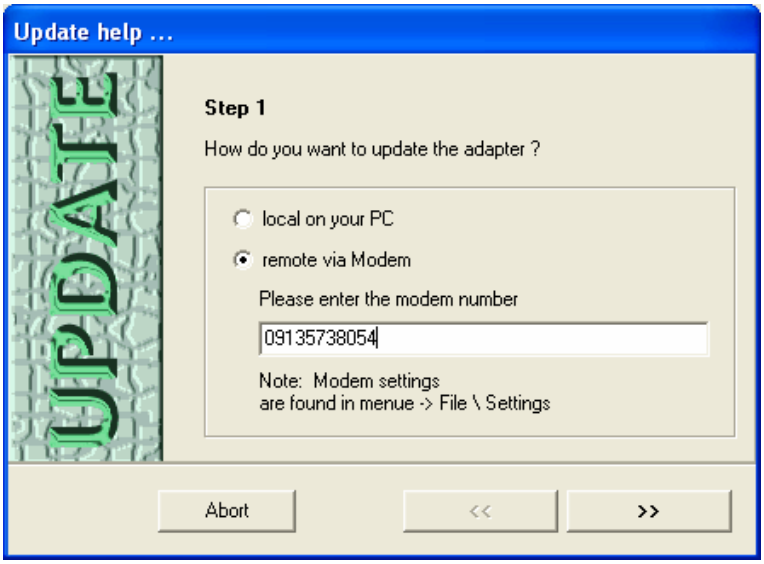
How to perform an update is explained below.



- Via menu item "*Adapter / … select,*" the required device is selected by its order number (in this case, the SSW7-TS PRO ISDN).
- Via menu item "*Adapter / Select COM port/serial number,*" the required interface is selected.

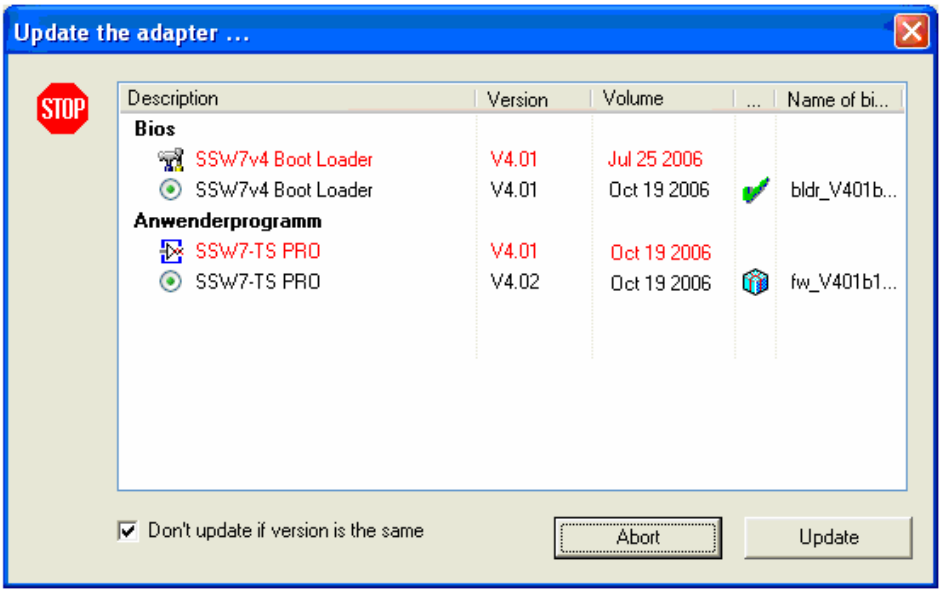
The selection is shown on the status bar on the lower edge of the application window.

- After selection of the "*Adapter / Update adapter*" menu item, it is possible to define the access path in step 1 (local or remote).



- After step 1 is confirmed, an attempt to establish a link to the SSW7-TS PRO ISDN follows. If this is successful, updating of the firmware sections, of which later versions are available, begins automatically.

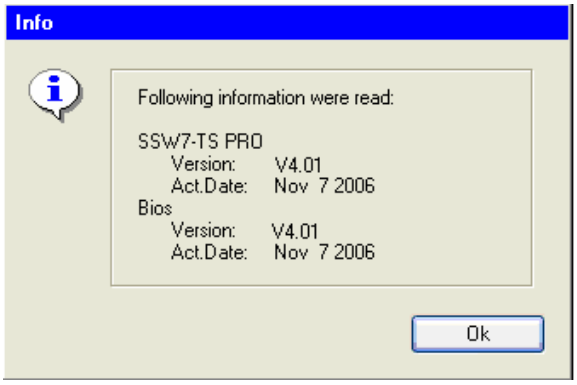
- If, under "*File / Settings*" the "*Automatic update*" option is deselected, the user can select the components that will be updated. The update process is started by pressing the "*Update*" button.



Transmission of the new firmware can take several minutes depending on the transmission rate of the link and should not be interrupted!

- *Finished* shows that the update has been successful.

- If the update is performed locally, the current version of the imported firmware can be read with menu item *"Adapter / Read out information from the adapter."*



4.4.3 Parameterization with SHTools

SHTools is an alternative to the Teleservice software for parameterizing the SSW7-TS PRO ISDN.

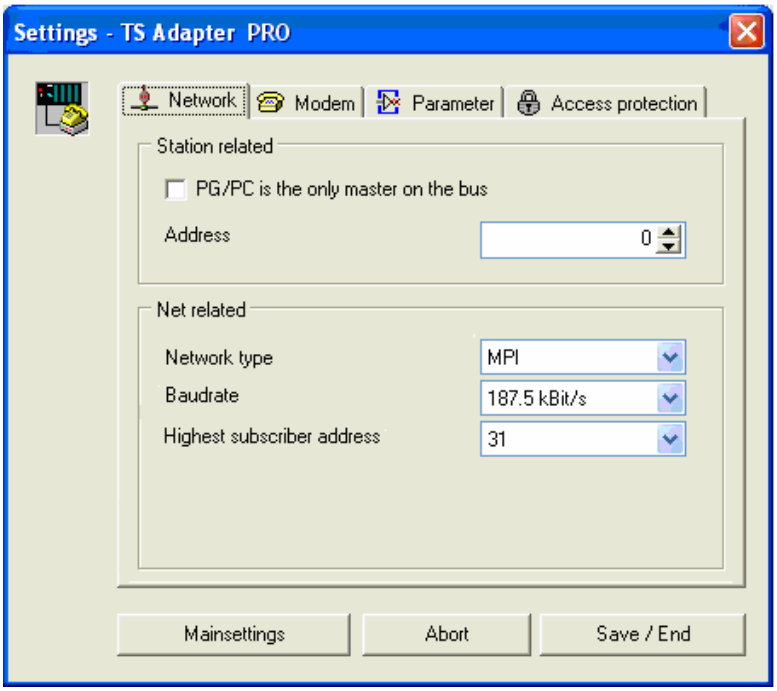
For parameterization, a link must be established between the SSW7-TS PRO ISDN and an RS232 interface on the PC on which SHTools is installed. The micro-switch on the SSW7-TS PRO ISDN must be put into the *"PC"* position. The *"PC"* operating mode is indicated by the lit green *"TS/MDM/PC"* LED.

With the "*Adapter / Read parameters from the adapter*" menu item, it is possible to read the current parameterization out of the SSW7-TS PRO ISDN.

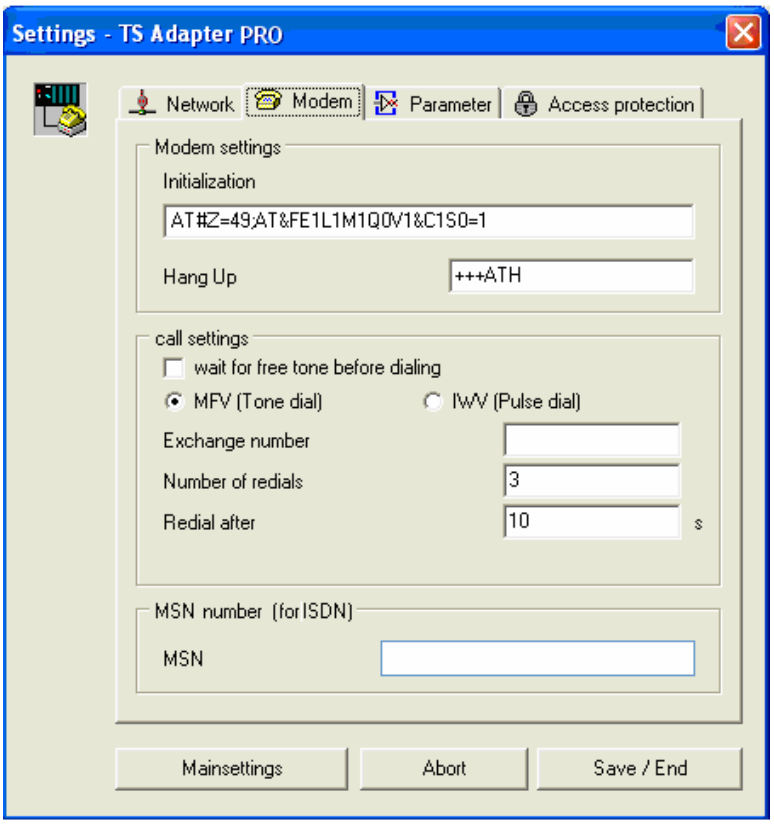
The read parameters are displayed in the *"Settings – TS adapter"* window.

The window contains four tabs providing access to functionally independent parameterization options:

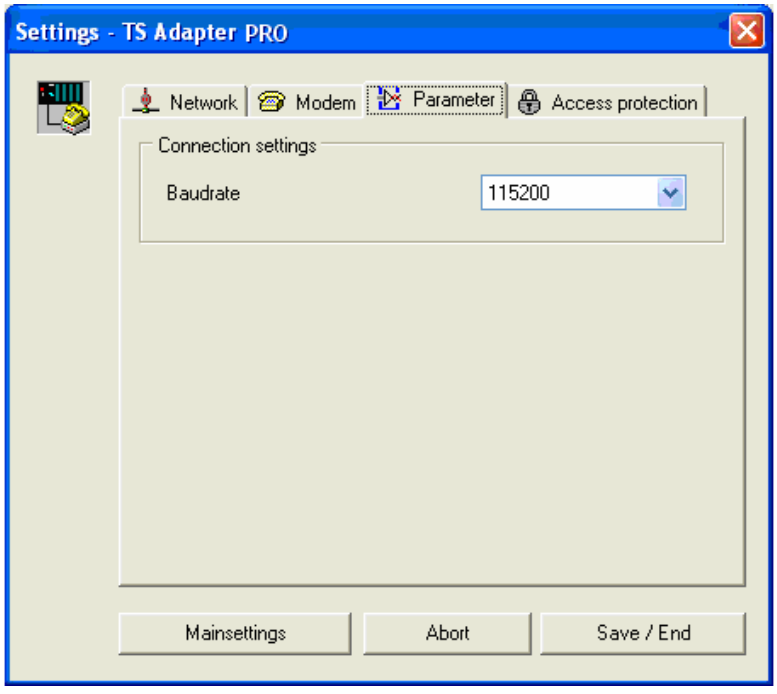
- Setting the MPI/PROFIBUS-specific parameters



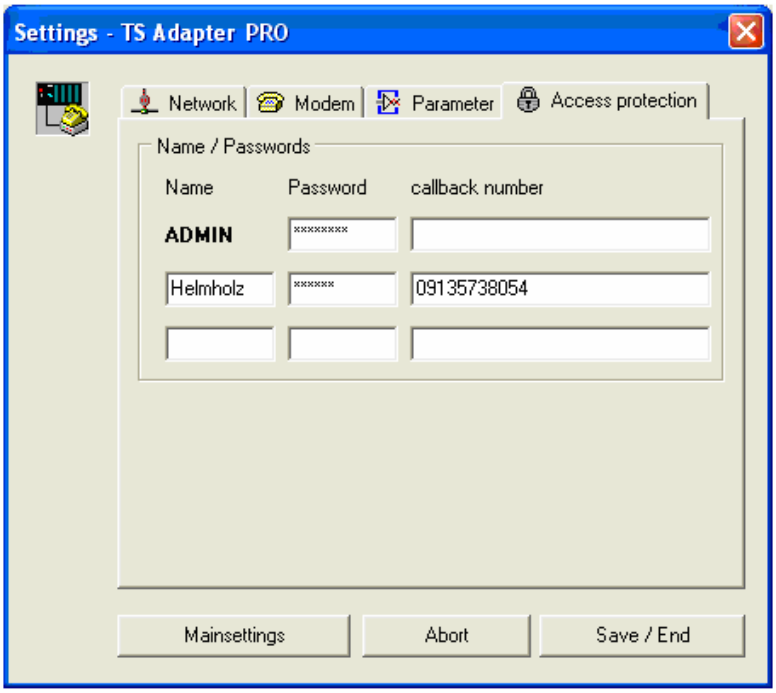
- Setting the modem-specific parameters



- Setting the transmission rate between the modem and the SSW7-TS PRO ISDN



- Setting the access protection for remote access



With the "*Save / End*" button, the edited contents of the four tab cards are transferred to the SSW7-TS PRO ISDN.

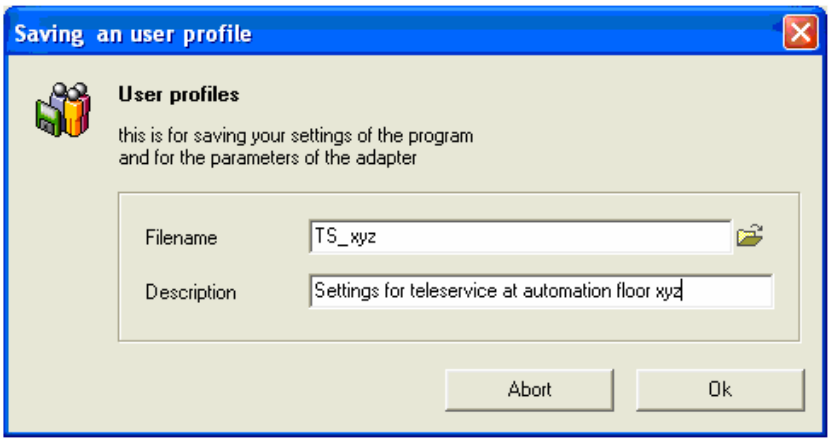
Pressing the "*Cancel*" button closes the setting window without making the changes.

You can display the basic settings (as-delivered state) by pressing the "*Basic settings*" button.

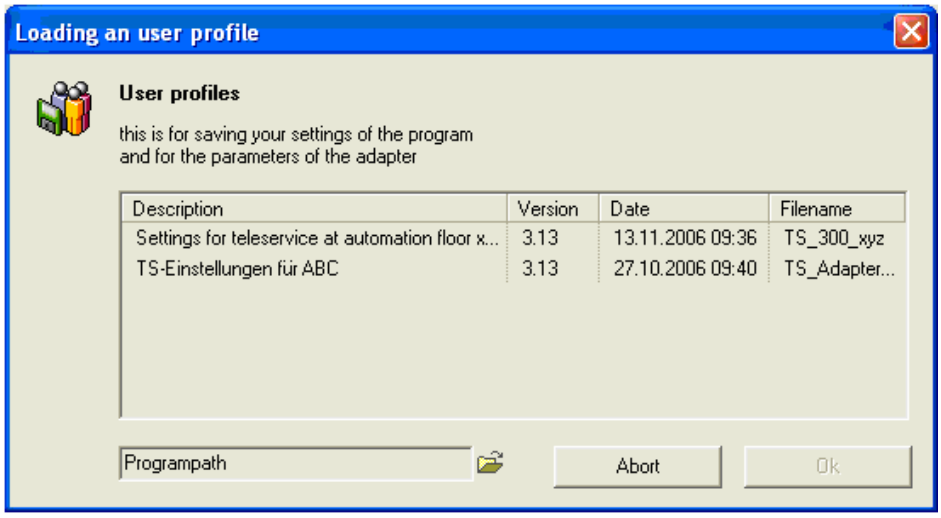
Once set, Teleservice parameters can be stored on the computer in a file and transmitted to further SSW7-TS PRO ISDN.

To save the changes made as a file on the PC in the last step, select menu item *"File / Save profile."*

In the "*Saving a user-defined profile*" window, it is possible to specify a meaningful file name with a short description.



To open a user-defined profile, choose the menu item *"File / Open stored profile."* In the "*Loading a user-defined profile*" window, which then opens, you can select the required profile.



With the "*Adapter / ... Settings*" menu item, it is possible to view and change the current profile.

5 Operation on a programmable controller

There are different ways of connecting the SSW7-TS PRO ISDN to the programmable controller on one side and the telephone network or programming device or PC on the other side.

As a special function, the SSW7-TS PRO ISDN offers the option of communicating with the modem via the USB or RS232 interface. The MPI/PROFIBUS functionalities are deactivated in this case.

5.1 USB or RS2323 direct operation on a PG/PC

To be able to use the SSW7-TS PRO ISDN like a local TS adapter, in addition to the existing USB or RS232 link to the local computer, the micro-switch for the operating modes must be in the *"PC"* position. The LED with the name *"TS/MDM/PC"* is lights up green in this switch position.

Locally, we recommend using the SSW7-TS PRO ISDN as a PC adapter (Auto/MPI/PROFIBUS). So it is not necessary to have the Telesevice software for local access installed in every PC.

5.2 Modem operation in a telephone network

To use the SSW7-TS PRO ISDN for teleservice of a S7-300 or S7-400 controller, it must be correctly parameterized and wired in the system.

In addition to connection to an enabled telephone line, the position of the micro-switch for the operating modes is especially important. The switch must be put in the *"TS"* position, which is indicated by the *"TS/MDM/PC"* LED going out.

On the local computer, which is to communicate with the SSW7-TS PRO ISDN via a remote link, a functioning modem link to the outside world and dial-in software are required.

When using the Teleservice software by Siemens, we recommend Version 6.1 (or higher) for hassle-free operation.

5.3 USB or RS232-to-modem operation

To use the modem of the SSW7-TS PRO ISDN as a simple ISDN modem that does not provide TS adapter functionality, the microswitch can be put in the *"MDM"* Position. This switch position is indicated by the red *"TS/MDM/PC"* LED.

In this mode, it is possible to access the modem directly via the USB or RS232, for example, to parameterize the modem.

In this mode, a link to another modem via the telephone network is also possible, for example, to connect to SCADA systems etc.

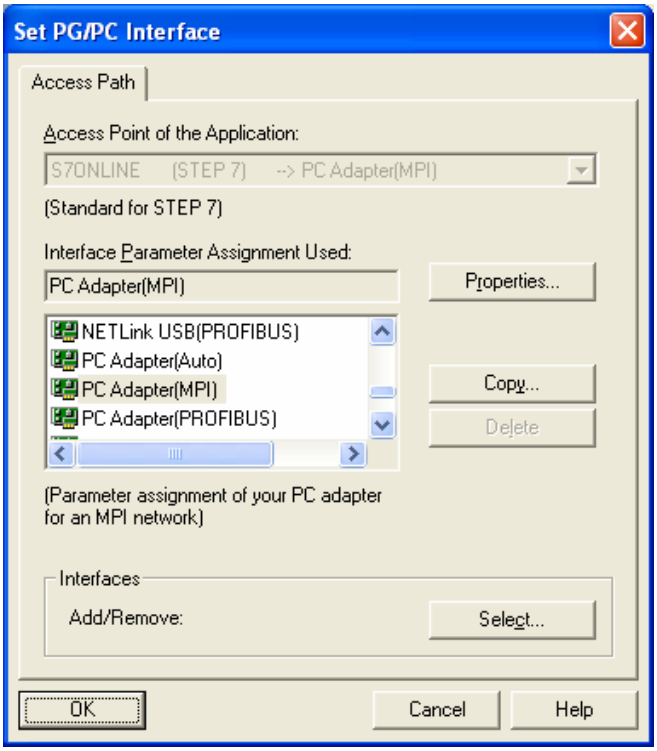
6 Configuration of the Simatic tools

6.1 Direct operation as a PC adapter (Auto/MPI/PROFIBUS)

For direct operation, the SSW7-TS PRO ISDN is connected to a programming device or PC via the USB or null modem cable supplied.

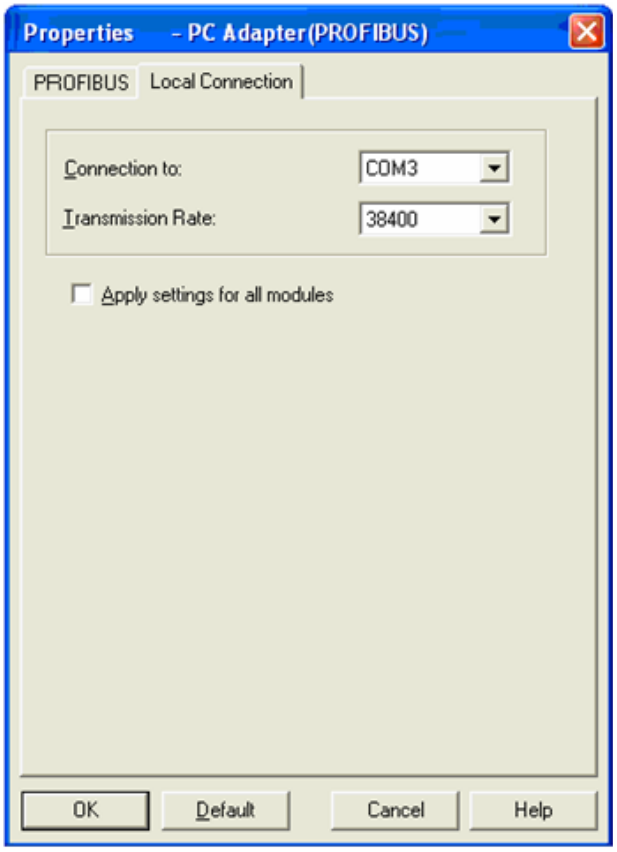
If the micro-switch is in the *"PC"* position, which is indicated by a green *"TS/MDM/PC"* LED, the SSW7-TS PRO ISDN is used as a TS adapter in direct operation or as a PC adapter (Auto/MPI/PROFIBUS).

On computers on which Teleservice is not installed, the TS adapter in the programming device or PC interface cannot be selected. However, the PC adapter (Auto/MPI/PROFIBUS) can always be used for direct operation.

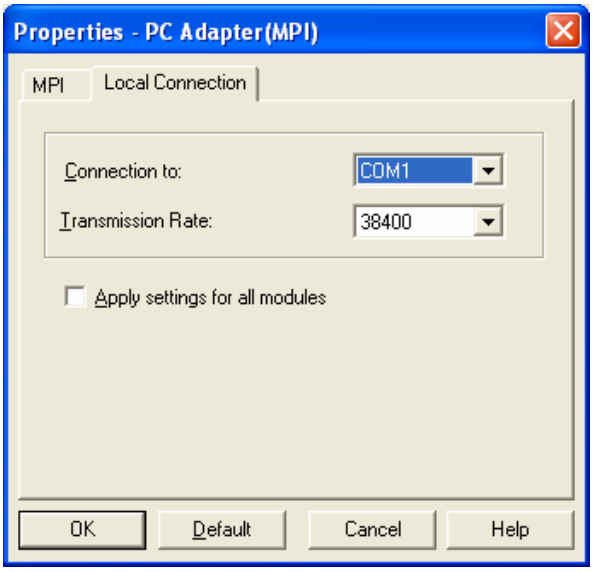


Under the "*Properties*" of the MPI or Profibus settings, the appropriate COM port must be selected before first use. On connection via USB, the previously installed virtual COM Port must be set (see Section 4.2).

Example of Profibus interface selection on connecting the USB cable to the virtual COM port:



Example of MPI interface selection on connecting the null modem cable via RS232:



After the MPI or Profibus-specific bus parameters have been adapted, it is possible to access the connected application in the usual way.

6.2 SSW7-TS PRO ISDN for teleservice (modem operation)

To select a SSW7-TS with ISDN modem, an ISDN modem is required on the programming device or PC. If a modem is already installed under Windows, this can also be used for teleservice.

Plug-and-play modems are automatically recognized by the programming device or PC and integrated in the system as soon as they are connected. The driver supplied with the modem is required for this.

You can manually install modems without plug-and-play capability via the control panel under "*Telephone and modem options*" in the "*Modems*" dialog box.

Once the ISDN modem has been installed please ensure that the X.75 protocol is used as the transmission protocol (see chapter **Fehler! Verweisquelle konnte nicht gefunden werden.**).

Please also remember to assign an MSN to make use of the callback function of the SSW7-TS with ISDN modem.

The AT command sequence for assigning the MSN is given in the manual of the ISDN modem used.

It should be possible to address the modem as soon as you have installed it on one of the COM interfaces of the programming device or PC. It can then be selected in the parameterization of the programming software.

To test the TeleService and modem settings on the programming device or PC, you can select the TeleService test system of Systeme Helmholz GmbH. The relevant telephone numbers can be obtained from the technical support of Systeme Helmholz GmbH.

6.2.1 Settings on the SSW7-TS PRO ISDN

On the SSW7-TS PRO ISDN, the micro-switch position *"TS"* is set, which is indicated by the *"TS/MDM/PC"* LED going out.

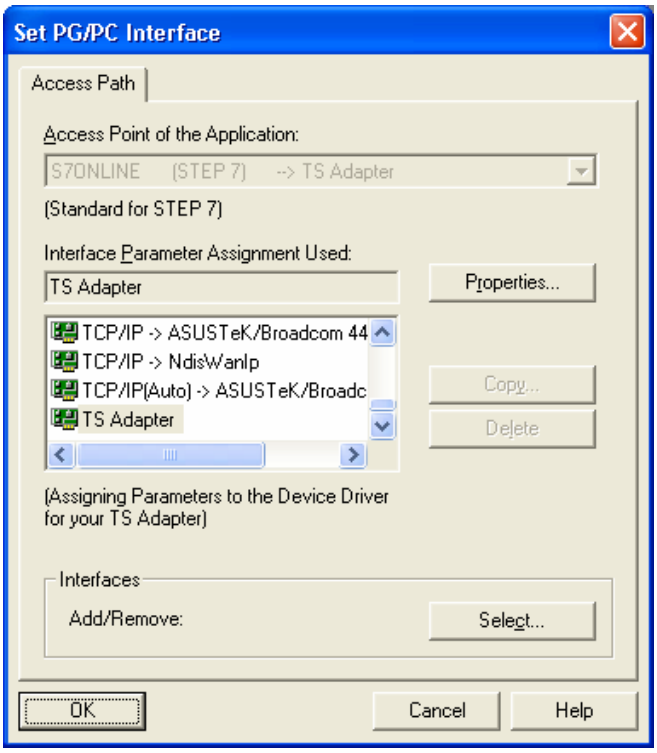
When the device is supplied with power only the *"Power"* LED and, after some time, also the *"Active"* LED should be active. The SSW7-TS PRO ISDN is now signed onto the MPI bus and has parameterized the internal modem.

The internal modem has to be initialized before it is ready to accept calls. An initialization string is stored in the SSW7-TS PRO ISDN for this.

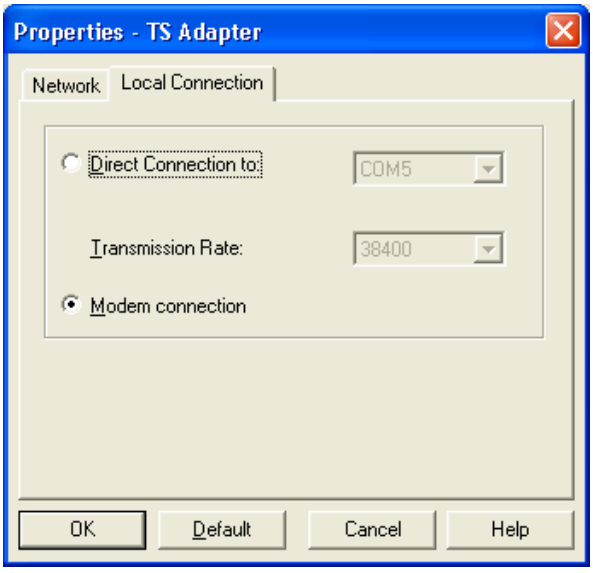
If no further user-specific settings have to be made, the SSW7-TS PRO ISDN is then ready for teleservice.

6.2.2 Settings in the programming device or PC interface

In the programming unit or PC interface, the *"TS adapter"* must be selected as the access point to be able to communicate with the remote programmable controller after selecting the SSW7-TS PRO ISDN through Teleservice.



For teleservice, the "*Modem connection*" mode must be selected on the "*Local connection*" tab card in the properties of the TS adapter.



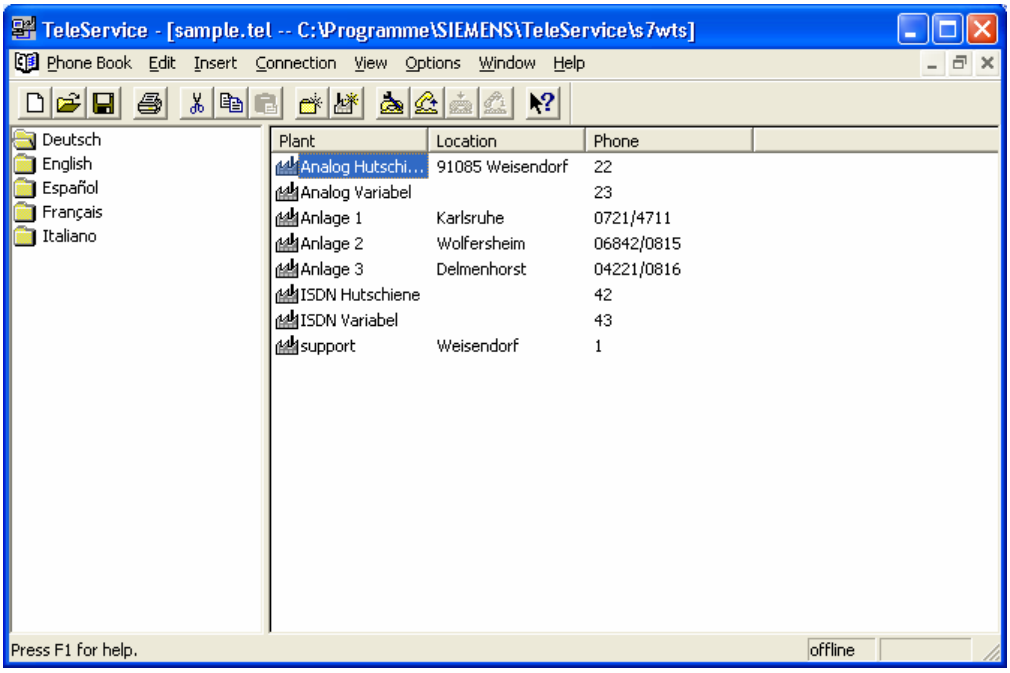
!

Parameterization using Teleservice 5.x or older is currently not possible!

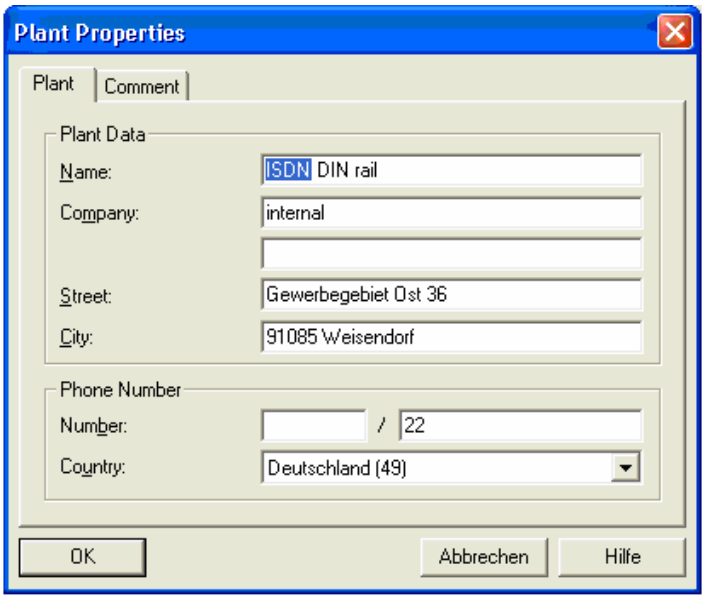
6.2.3 Settings through Teleservice

For teleservice, you will also need an additional software module for your programming software, e.g. Teleservice from Siemens

(version 5.2 and later), to establish a link and manage further links (telephone book of stored systems).



After you have created a telephone book entry for a system, a telecommunication link can be established via the telephone network.



System or network-specific settings of the SSW7-TS PRO ISDN can be made with the Teleservice software or SHTools (see Section 4.4.3).

The specific settings can be changed locally by Teleservice or via the telecommunication link.

Via the SHTools, parameterization can only be performed locally.

Local parameterization using the null modem cable supplied on the programming device or PC interface and the Teleservice software is described below.

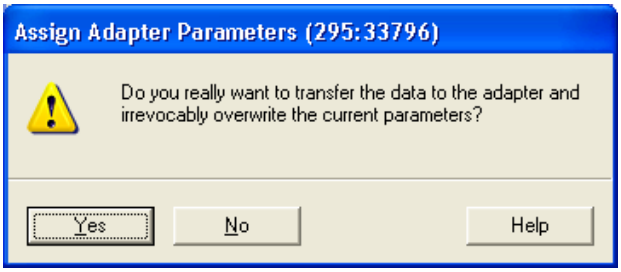
The micro-switch on the SSW7-TS PRO ISDN must be in the *"PC"* position, which is indicated by the lit green *"TS/MDM/PC"* LED.

In the Teleservice software, the settings for the SSW7-TS PRO ISDN can be made via the "*Tools / Parameterize adapter*" menu item.

After parameterization in the "*Parameterize adapter*" window, the data are transferred to the TS 300 with the "*OK*" button. But first, you must confirm that you want to overwrite the existing parameterization.

!

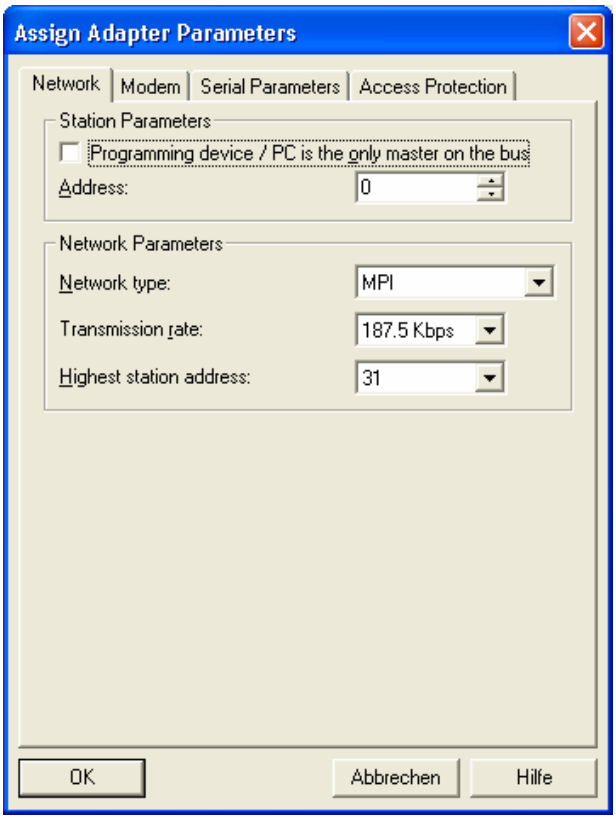
It may be necessary to redial the controller via a telecommunication link after making a change.



6.2.3.1 Bus parameters

The "*Network*" tab of the "*Parameterize adapter*" window contains all bus-specific parameters that can be influenced.

The SSW7-TS PRO ISDN supports the network types *MPI, PROFIBUS,* and *AUTO* with a transmission rate of up to 12 Mbps.



!

If the network settings are different, access to the CPU via a telecommunication link is not possible!

If the network type setting *"AUTO"* has been deselected, the

- Network type
- Transmission rate
- Highest station address

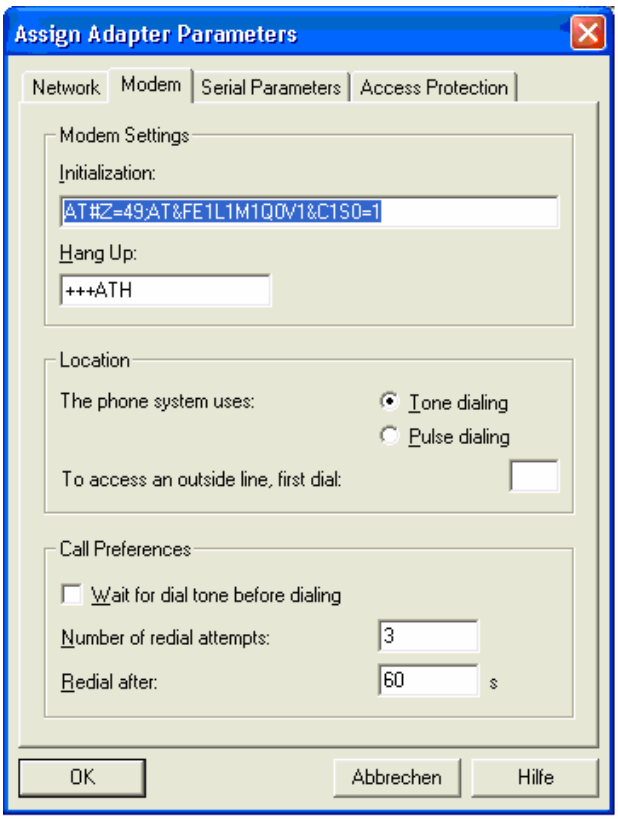
must match the hardware configuration of the connected CPU. Moreover, it is important that an MPI/PROFIBUS address is assigned to the SSW7-TS PRO ISDN that has not yet been used in the connected network.

6.2.3.2 Modem parameters

The "*Modem*" tab of the "*Parameterize adapter*" window contains all modem-specific parameters that can be influenced (see picture below).

!

The semicolon separates the first and second AT command sequence and must not be omitted!



The internal modem of the SSW7-TS with ISDN modem is initialized automatically after switch-on. For this purpose, the initialization string is sent to the modem so that it can make settings.

The following sequence of commands is the default setting and affects the modem as follows:

AT	Initiate modem commands
&F	Load factory settings of the modem
E1	Echo of the ON command
L1	Volume level 1
M1	Loudspeaker ON
Q0	Feedback from the modem ON

V1 Feedback in plain text

&C1 DCD signal shows carrier connected

S0=1 Accept after a bell signal

If the SSW7-TS with ISDN modem is to be operated on a point-to-multipoint ISDN connection with several terminals, the MSN (multiple subscriber number) must be assigned to the internal modem module.

The command sequence for assigning the MSN is added to the initialization string and separated off by a separator.

The command sequence for assigning the MSN has the following meaning:

!

49 is only an example in this case. The correct MSN must be entered!

AT Initiate modem commands

#Z= Transfer MSN

49 Assign MSN number 49 (extension number)

; Separator between two AT command sequences

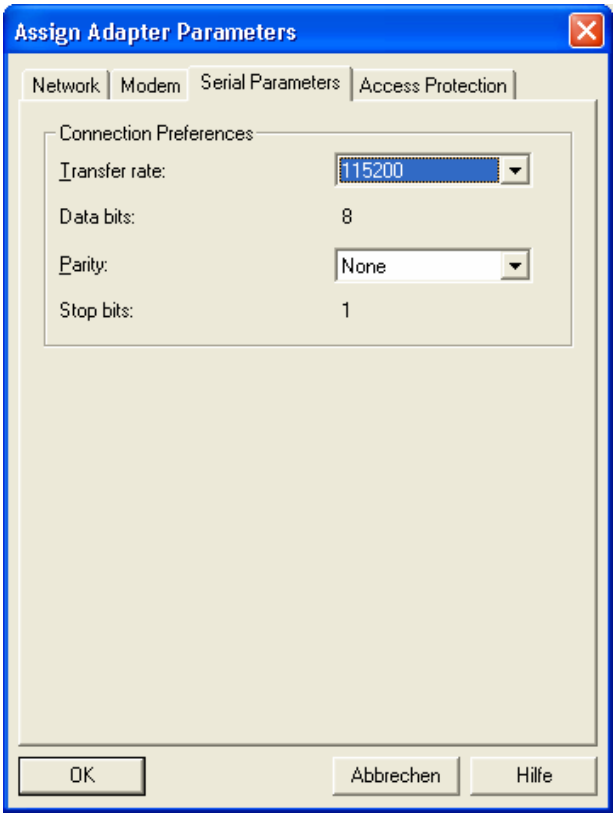
The MSN is generally two to three digits long, for example, *"49"* or *"223"*, and is identical to the extension number of the terminal.

As the figure above shows, the initialization string of ISDN modems generally consists of two command sequences (separated by a semicolon). The first part is transmitted only when the device is switched on so that the modem receives the MSN assigned to it. The second part is sent to the modem again each time the connection is terminated.

For further information on AT commands see the appendix (see chapter 8.3.1).

6.2.3.3 Serial parameters

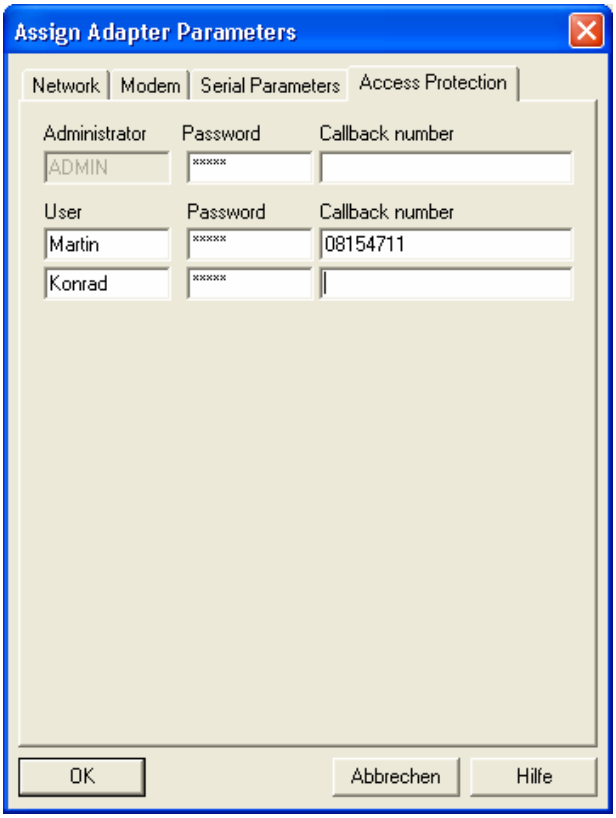
The *"Serial parameters"* tab of the *"Parameterize adapter"* window contains all parameters for serial communication with the modem that can be influenced.



6.2.3.4 Access protection and the call-back function

The *"Access protection"* tab of the *"Parameterize adapter"* window contains all user-specific parameters that can be influenced.

Via this tab card, the SSW7-TS PRO ISDN can be configured to permit teleservice via the Teleservice software only with the relevant authorization.



Please note that *"Users"* created via a telecommunication line can only reparameterize their own access account. The administrator, on the other hand, can change all three user accounts via a telecommunication link.

!

A call-back number should not be stored for the user "ADMIN"!

If an incorrect call-back number is saved under the user *"ADMIN"*, it will be very difficult to reparameterize the SSW7-TS PRO ISDN via a telecommunication link. Any *"Users"* you have created can change the user-specific but not the user-dependent settings.

Local reparameterization is possible at any time.

7 Troubleshooting

The points described here show some typical errors that can occur in day-to-day work with the SSW7-TS with ISDN modem.

If a problem is not described here and this manual does not provide any information on how to remedy it, the support of Systeme Helmholz GmbH will gladly help you to solve the problem.

Q: I have several stations on my S_0 bus and have therefore parameterized an MSN in the SSW7-TS with ISDN modem. I am not able to establish an ISDN connection to the SSW7-TS with ISDN modem. But I can establish a connection when I delete the MSN.

A: If several stations are operated on the S_0 bus, an MSN must be assigned. In this case, telephone number identification suppression must be deactivated for the ISDN connection used so that the SSW7-TS with ISDN modem can determine which calls are for it from the transmitted MSN.

Q: I have problems operating my standard modem with a USB-to-serial converter on my PC when I want to perform teleservice.

A: Many converters available on the market cannot emulate all status signals of a real RS232 interface. We do not recommend using such devices for the functions described in this manual.

Q: I had installed the USB driver for SSW-TS PRO ISDN for direct use on my PC. In the PG/PC interface the COM-PORT *"9",* which I had chosen, is displayed. But Step7 do not work with the SSW7-TS PRO ISDN.

A: The PG/PC- interface although display all available COM-Ports, but just can work reliable with the first eight COM-Ports. Please set the used COM-Port in the Hardware manager from your windows version manual to a COM-Port lesser or equal *„8"* to ensure the function.

Q: I dial up an ISDN modem on the controller with my analog PC modem but the remote station does not respond.

A: Before configuration, please note the type of connection with which teleservice is to be implemented and whether this type of connection is technically possible. Not all combinations of modems can communicate with one another.

Data connections can be established between:

	analog	ISDN	GSM
analog	yes	no	yes
ISDN	no	yes	yes
GSM	yes	yes	yes

Q: In which countries of the world is the European DSS1 ISDN protocol also supported?

A: Eastern European countries, China, Australia, South Africa

Q: What must I observe when calling your technical support?

A: Please have all relevant data of your system constellation with the connected stations and program modules at hand when you contact technical support at Systeme Helmholz GmbH.

8 Appendix

8.1 Technical Data

Device type	700-770-8IS41 (ISDN)
Degree of protection	IP 20
Dimensions	135 x 67 x 30 mm (LxWxH)
Weight	Approx. 240 g
Operating voltage	+24 V DC ± 25%, external or from the programmable controller
Current consumption	approx.140 mA
Temperature during operation	0 °C to +60 °C
Temperature during storage/transportation	-20 °C to +60 °C
Relative humidity during operation	5 % to 85 % at 30 °C (no condensation)
Relative humidity during storage	5 % to 93 % at 40 °C (no condensation)
Quality assurance	according to ISO 9001:2000
Maintenance	Maintenance-free (no battery)
MPI/PROFIBUS	
- Interface	9-way Sub D socket / RS485 repeater, isolated
- Connecting cable	1.2 flexible control cable with copper braided shield
- Transmission rates	19.2 kbps to 12 Mbps
USB	
- Interface	USB-Mini-A socket / USB 1.1 compliant
- Transmission rate	9.6 kbps to 115.2 kbps through virtual COM port
RS232	
- Interface	RS232, serial asynchronous
- Transmission rate	9.6 kbps to 115.2 kbps
Modem	
- Interface (internal)	RS232, V.24/V.28
- Transmission rate	9.6 kbps to 115.2 kbps
- Modem connection	RJ-11 socket
- Modem type	ISDN-S0 interface per ITU I.430, 64 kbps
- Transmission standards / protocols	Transmission in D channel at 9,600 bps (X.31-D) Transmission in B channel at 64,000 bps (X.31-B) B channel: V.110, X75, X25/X31, HDLC (transparent) D-Kanal: DSS1, X.31
- Dialing procedure	Hayes dialing (AT command set), V25 to async. hotline 108 DTR, X.3 (PAD)

8.2 Pin assignments

8.2.1 MPI/PROFIBUS interface pin assignments

Connector	Signal	Meaning
1	-	unused
2	-	unused
3	RxD- / TxD-P	receive / transmit data-P
4	RTS_AS	CPU transmit ID
5	DGND	Ground for bus termination (looped through)
6	DVCC	5 V DC for bus termination (looped through)
7	-	unused
8	RxD / TxD-N	receive / transmit data-N
9	RTS_PG	Programming device transmit ID

8.2.2 ISDN modem connection

RJ11 pins	Designation
1	unused
2	STA / Tx+
3	SRA / Rx+
4	SRB / Rx-
5	STB / Tx-
6	unused

8.2.3 Assignment of the USB interface

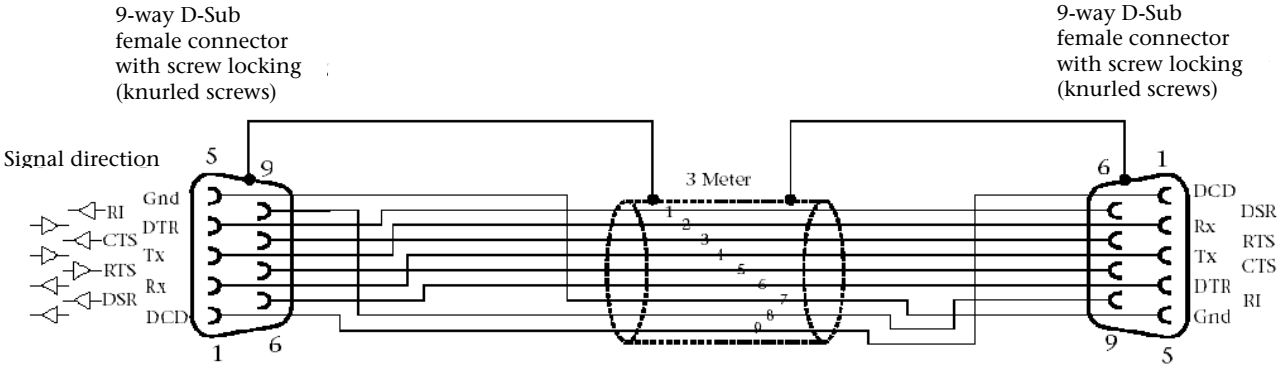
USB A	Signal	Meaning	Mini USB -5P
1	VCC	DC +5 V	1
2	D-	Data signal -	2
3	D+	Data signal +	3
4	GND	Ground	5
Shield		Shield	Shield

The SSW7-TS PRO ISDN comes with a shielded USB 2.0 cable with a length of two meters. The cable has a standard Mini-A and a standard B connector.

Where distances of more than three meters have to be covered, we recommend using USB hubs with an external power supply.

8.2.4 Connecting cable

Programming device or PC to SSW7-TS PRO ISDN for direct operation or use of the modem (700-751-7VK81):



8.2.5 Power supply socket

If an external power supply is used, please make sure the polarity is correct and all technical data are complied with.

8.3 Modem data

8.3.1 AT command set for the internal modem

Factory settings for the basic functions are permanently stored in each modem. The user can make further settings or check settings using a terminal program.

The modem initialization string consists of one or more defined commands. The quasi standard is defined in the Hayes command set. They are also widely known as *"AT commands"*. They set up the modem for communication with the telephone network and the connected application. They define, for example, the dialing mode, waiting times, detection of the busy tone etc.

The internal ISDN modem in the SSW7-TS with ISDN modem works with the basic command set.

For special functions there are also manufacturer-specific and extended AT commands.

Systeme Helmholz GmbH will be happy to provide the complete list on request.

If the internal modem receives an AT command after switch-on, it automatically performs adjustment to the baud rate, number of data bits and stop bits and the parity.

Each AT command starts with the letters *"AT"* and ends with *"CR"* (return). Both upper case and lower case letters are accepted, but the leading characters must be either *"AT"* or *"at"*. The command line is evaluated as soon as the modem has received a return.

The standard end character is *"Return"* ($0D_{hex}$) also known as *"<CR>"*. After you have entered "****" or "+++", you must not enter *"Return"*.

The commands are acknowledged with *"OK"* or *"ERROR"*. A command being processed is interrupted by each further character that is received. For this reason, it is necessary to wait for acknowledgment before sending the next command. Otherwise the current command will be deleted.

8.3.2 S-register contents for the internal modem

Certain value ranges are defined in the internal modem memory using the *"S-register"*. These status registers control operation. Each register stores a certain *"variable"* (alphanumeric information) that is used by the modem and the communication program.

S-registers can be read and written with the ATS command. Certain S-registers can only be read; in others it is only possible to set a certain value range.

On value range overflow, the modem signals OK although the value was not accepted. It is therefore advisable to check changes immediately by reading them out again.

Register	Description
S0	0: No automatic call acceptance, acceptance of an incoming call is controlled by the data terminal (ATA command after RING) 1: Immediate call acceptance by the ISDN modem (default) *2..n*: Call acceptance through the terminal adapter after *n* "RING" messages. Note: The time between two ring messages can be configured using the TA-configuration command "ringtimer" (default = 5 sec.)
S1	Ring counter (read only)
S2	Escape character (default = 43h)
S3	Return character (default = 0Dh)
S4	Line feed character (default = 0Ah)
S5	Backspace character (default = 1Ah)
S7	Waiting time for carrier signal in seconds (default = 30)
S9	Enable PNP functionality for Windows 95 (default=1, enabled)
S14	Status switch output OUT1 0 Normally-closed contact 1 Normally-open contact 2 follows DCD
S15	Status switch output OUT2 0 Normally-closed contact 1 Normally-open contact

Register	Description
S16	Last CAPI/ISDN error cause that occurred
S17	Status alarm input 1 (ready only) 0 activated (connected to GND) 1 open
S18	Status alarm input 2 (ready only) 0 activated (connected to GND) 1 open
S90	Last incoming ISDN calling number (CLIP)
S91	0: Default: 1: all unknown AT commands will be answered with OK. 2: Windows 2000 compatibility: some AT commands will be answered with OK, unknown AT commands will be answered with OK.

8.4 Further documentation

Internet:

http://www.helmholz.de

http://www.siemens.com

Notes