TS 300 analog

700-753-8MD21

User Manual

Edition 6 / 16.03.2009

from HW 3-3A-3 and FW 3.25 and higher

Order number of manual: 900-753-8MD21/en

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 information in this manual is regularly updated. When using purchased products, please heed the latest version of the manual, which can be viewed in the Internet at www.helmholz.de, from where it can also be downloaded.

Our customers are important to us. We are always glad to receive suggestions for improvement and ideas.

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Revision history of this document:

Edition	Date	Revision
3	04.02.2008	Adaptation for modem driver, Mounting rack in miscellaneous
4	05.03.2008	Troubleshooting upgrade
5	08.07.2008	Flashloader section deleted, list of country code combined
6	16.03.2009	Edit technical specifications (P. 56)

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*

ℹ   *gives information*

⚠   *hazard, general or specific*

⚡   *Danger of **electric shock***

1.1   General

The TS 300 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

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

This manual is addressed to anyone wishing to configure, use, or install the TS 300.

The manual tells the user how to operate the TS 300 and explains the signaling functions. It provides the installing technician with all the necessary data.

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

The TS 300 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 TS 300 must only be used as a communication and signaling system as described in the manual.

1.5　Avoiding use not as intended!

Safety-related functions must not be controlled via the TS 300 alone. Make sure in the software that uncontrolled restarts cannot occur.

2 Installation and Mounting

Installation and mounting must be effected in compliance with VDE 0100 / IEC 364. Because it is an IP20 module, you must install it in a cabinet.

An ambient temperature of 0 to 60 ºC must be ensured for reliable operation.

2.1 Vertical and horizontal mounting

The modules can be mounted either vertically or horizontally.

Permissible ambient temperature:

- for vertical mounting: from 0 to 40 ºC

- for horizontal mounting: from 0 to 60 ºC
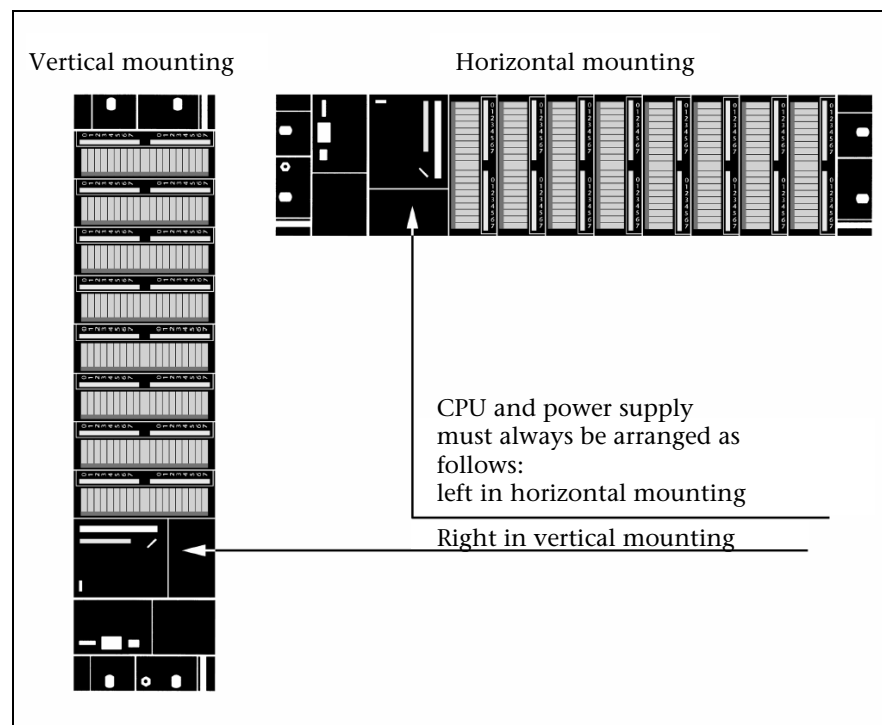
2.2 Minimum clearance

Minimum clearances must be observed because

- it ensures the TS 300 is cooled

- it provides space to insert and remove modules

- it provides space to route cables

- it increases the mounting height of the module rack to 185 mm, although the minimum spacing of 40 mm must still be observed

The following diagram shows the minimum spacing between the module racks and between these and any adjacent cabinet walls, equipment, cable ducts, etc. for S7-300s mounted in several module racks.

Non-observance of the minimum distances can destroy the module at high ambient temperatures!
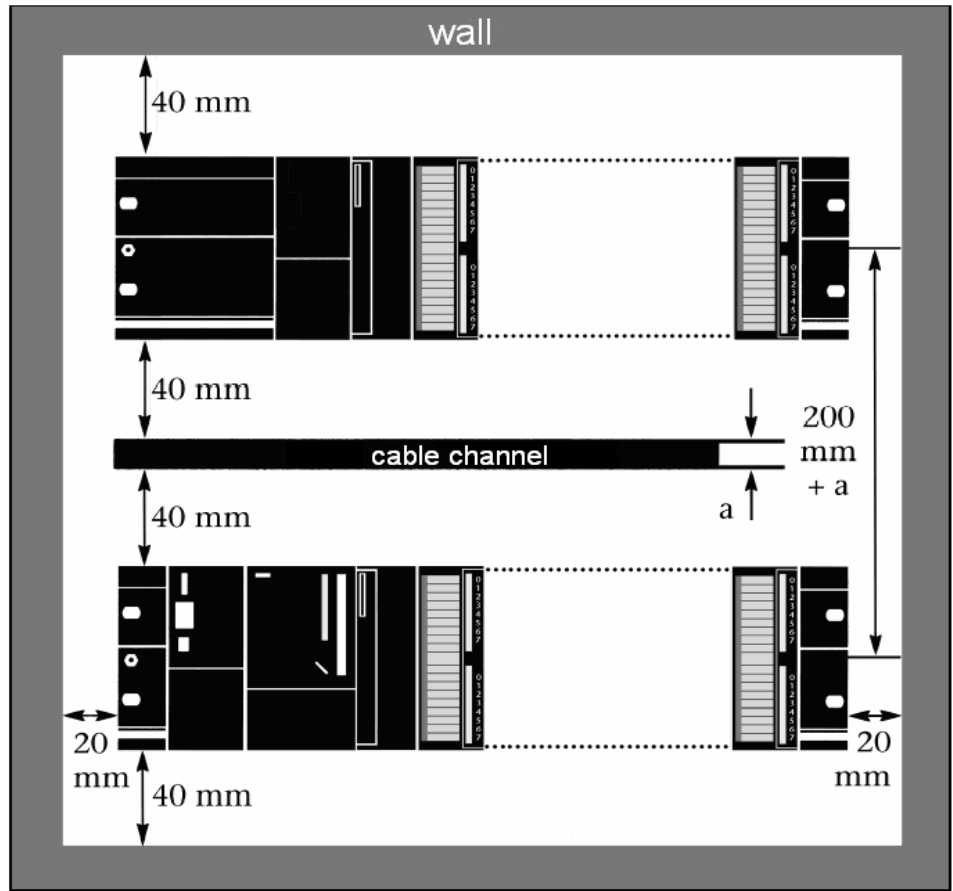
2.3 Mounting of the module on the DIN rail

A backplane bus connector is included with each signal module but not with the CPU. When connecting the backplane bus connector, always start with the CPU.

Take the backplane bus connector off the last module and insert it into the CPU.

Do not plug a backplane bus connector into the last module of the tier.
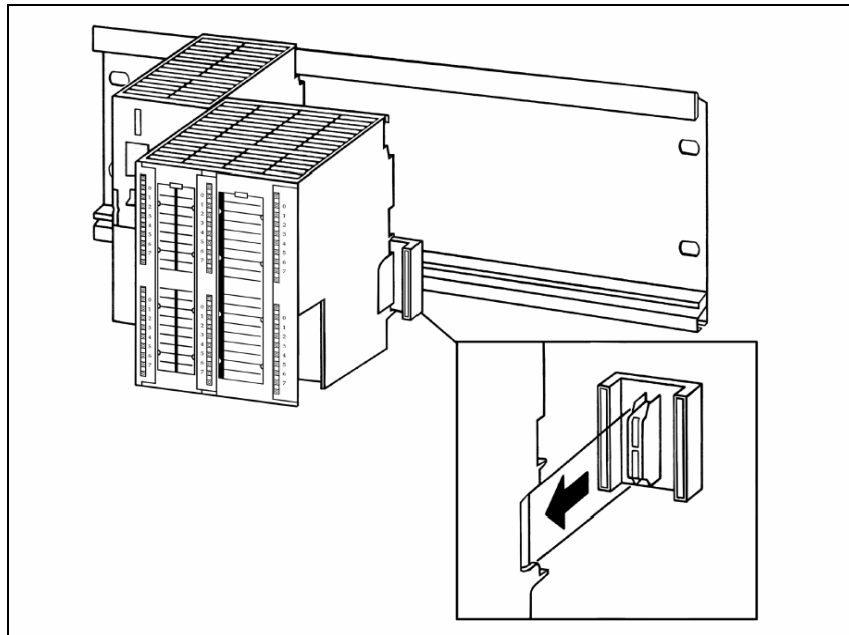
Hook on the modules (1), slide them up to the left module (2), and click them downward (3).
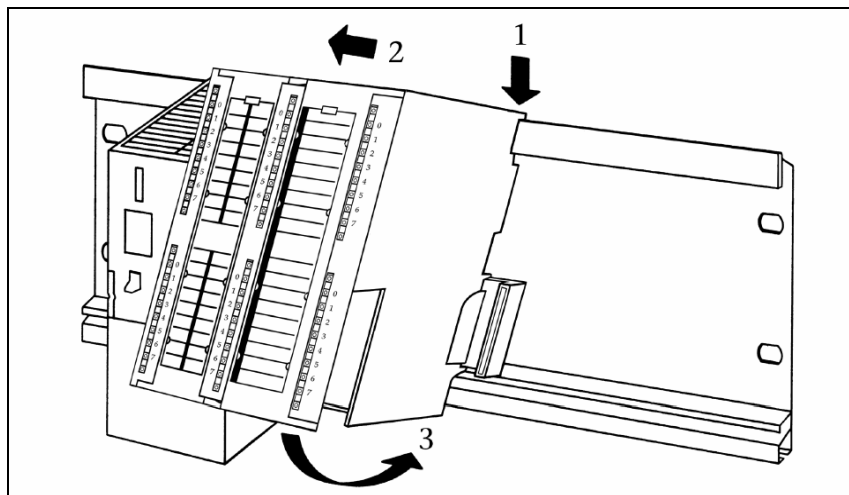
Screw the modules on with a torque of 0.8 to 1.1 Nm.

0,8 bis 1,1 Nm
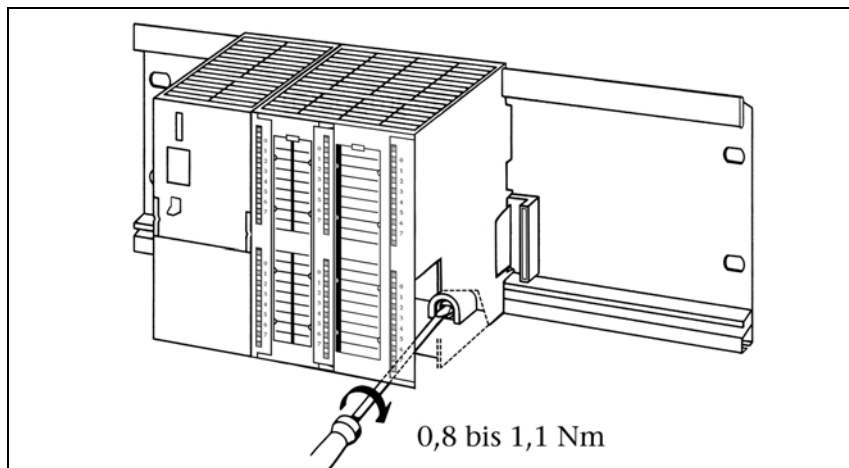
3 System Overview

3.1 Application and function description

The TS 300 is a gateway between the USB or modem and an MPI bus.

The USB interface can also be directly connected to the modem to implement communication away from the MPI bus.

The integrated 56k modem of the TS 300 is industry standard and supports all common transmission standards.

The user can make functional adaptations for teleservice via the telephone network in over 90 countries. Adaptation allowing almost worldwide use is possible by assigning a certain country code using the Hayes AT command set.

With a USB or modem link, up to eight MPI links (19.2 kbps or 187.5 kbps) can be used simultaneously.

At the MPI end, the baudrate to be used is automatically detected.

The TS 300 requires about 500 mA, if it is powered via the backplane bus.

The TS 300 can draw the necessary power supply from the backplane bus of an S7 300 system or from an external power source that can be connected on the front.

If the TS 300 is powered via the backplane bus of an S7-300 system, please ensure that the TS 300 loads the backplane bus with approx. 500 mA.

FMx modules cannot be parameterized with the TS 300.

The MPI link of the TS 300 to a programmable controller of the S7-300 series is effected via the backplane pus or via the nine-way Sub D socket on the front of the device.

Programmable controllers of the S7-400 series are connected to the TS 300 via the Sub D socket.

The TS 300 can be snapped onto the DIN rails, if 300-type sectional rails are not used, using the mounting adapter for the DIN rail, which is available as an accessory.

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

With the appropriate software, it is possible to use the TS 300 as

- A programming adapter (TS or PC adapter),

- Teleservice unit, or

- Operator control and monitoring unit

A firmware update for the TS 300 can be transferred to the TS 300 adapter both locally and via a remote link.

The included backplane bus connector and the included USB and telephone cables ensure the TS 300 is immediately ready to use in an S7-300 programmable controller.

3.2   Connections

The TS 300 has the following connection options on the front and back:

- Power supply socket for input of 24 V DC.
  This power supply option can be used if the backplane bus does not provide sufficient power supply or if the TS 300 is not used on the backplane bus of a S7-300.

- RJ11 socket for connecting the corresponding TAE telecommunication cable.

- USB B socket for connecting the supplied USB cable for direct operation as a programming adapter or for using the internal modem, e.g. for SCADA or visualization systems.

- Nine-way Sub D socket for the front MPI connection.

- On the rear of the module, there is the connection for the backplane bus of a S7-300 system to make it as easy as possible to exchange data between the CPU and the TS 300.

LED displays

Microswitches / DIP switches

Front connectors
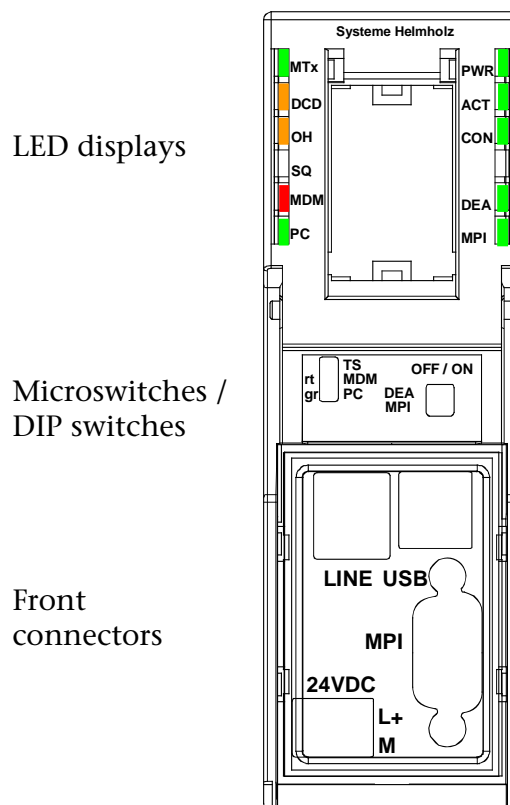
3.3 LED displays

The TS 300 has nine LEDs, including one two-color LED, to indicate its operating status.

These LEDs can be roughly divided into four groups:

- Status LEDs for standard and MPI functions
- Status LEDs for backplane bus functions
- Status LEDs for modem functionality
- Status LED for operating mode display

3.3.1 Status LEDs for standard functions

The three LEDs "*Power*", "*Active*", and "*Connect*" provide information about whether and how the TS 300 and MPI bus are functioning.

They also indicate an update process.

LED status for operating status	Power LED (green)	Active LED (green)	Connect LED (green)
Ready for operation	ON		
Actively logged on to the MPI 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	ON	OFF
Storing firmware update	BLINK	OFF	OFF

3.3.2 Status LEDs for backplane bus functions

The two LEDs "*DEA*" and "*MPI*" indicate which functions are enabled on the backplane bus.

Enabling is performed via the DIP switches "*DEA*" and "*MPI*", which are described in Section 3.4.2.

LED status for operating status	DEA LED (green)	MPI LED (green)
Module functioning as DIO 16 module on the backplane bus	ON	
Module functioning as a dummy without a reservation module on the backplane bus	OFF	
Module using MPI bus on the backplane bus and at the front connector		ON
Module using only MPI bus at the front connector		OFF

3.3.3 Status LEDs for modem functionality

The three LEDs "*MTx*", "*DCD*", and "*OH*" indicate the status of the integrated modem.

LED status for operating status	MTx LED (green)	DCD LED (orange)	OH LED (orange)	SQ LED
Modem transmitting data to TS 300 or USB without tele-communication link	BLINK	OFF	OFF	N.A.
Call/telecommunication link is switched through			ON	N.A.
Analog connection estab-lished. Modem ready for transmission of useful data		ON	ON	N.A.
Modem transmitting useful data to TS 300 or USB	BLINK	ON	ON	N.A.

3.3.4 Status LED for operating mode display

The two LEDs "*MOD*" and "*PC*" indicate which of the three possible operating modes the TS 300 is currently in.

LED status for operating status	PC LED (green)	MOD LED (red)
The internal TS adapter is connected to the internal modem (microswitch set-ting "TS"). The USB interface is inactive	OFF	OFF
The internal TS adapter is connected to the USB interface (microswitch setting "PC"). The internal modem is inactive.	ON	OFF
The internal modem is connected to the USB interface (microswitch setting "MDM"). The internal TS adapter is inactive.	OFF	ON

3.4 Function switch

3.4.1 Microswitch TS adapter

The "*TS/MDM/PC*" switch switches between the three possible operating modes.

- In switch position "*TS*", the TS 300 functions directly with the modem.
  That way, the TS 300 can be used for teleservice using the Tele-Service software (see Section 5.3).
  The USB interface does not have a function in this switch position.

- In switch position "*PC*", the TS 300 functions directly with the USB interface.
  The TS 300 can be operated on the local computer as the TS adapter (MPI) or as a PC adapter (MPI) (see Section 5.2).
  The modem is inactive in this switch position.

- In switch position "*MDM*", the internal modem functions directly with the USB interface.
  In this way, the modem can be directly addressed via the USB interface, for example, to parameterize it or to use it for teleservice purposes unconnected with MPI (see Section 5.4).
  The TS 300 cannot perform MPI functions in this switch position.

3.4.2 DIP switches DEA and MPI

- With the "*DEA*" DIP switch it is possible to activate ("*DEA*" LED lights green) or deactivate ("*DEA*" LED does not light up) the TS 300 as a 32-bit DIO module (16 DI / 16 DO).
  In the "*OFF*" switch position, the TS 300 on the backplane bus is a dummy module without its own IO array – all information on the backplane bus is looped through 1:1 (see Section 7).

- With the "*MPI*" DIP switch, it is possible to provide the MPI functionality of the TS 300 on the backplane bus of a S7-300 system.
  If the MPI functionality on the backplane bus is connected ("*ON*" switch position), the MPI bus is active on the front connector and backplane bus. This state is displayed by a lighted green "*MPI*" LED.
  In the "*OFF*" switch position, only the MPI connector on the front of the TS 300 is active (see Section 5.1).

3.5 Special functions

Irrespective of the pure teleservice features via the programming software of the Simatic CPUs, further additional functions are available in the TS 300, which are described as follows. They can be easily set up and used with the enclosed user programs.

3.5.1 Alarm function of the TS 300

The TS 300 can transfer alarms triggered by a program stored in the PLC to a recipient via SMS (see Section 7.1.1).

3.5.2 Switching outputs of the TS 300

The TS 300 features four switching outputs. These can be controlled independently of each other using SHTools both locally and via a modem line.

!

Note the special function of output 1!

Please note that output 1 of the TS 300 (input of the S7-300) is automatically closed while a pulse alarm is being processed.

The switching outputs of the TS 300 are transmitted on the backplane but and can be evaluated by a user program in a S7-300 controller (see Section 7.2).

3.5.3 Interface switchover via a telecommunication link

The operating mode of the TS 300 set by default with the micro-switch can be reset using the SHTools locally or remotely.

On changing the operating mode with SHTools, a timeout between one minute and 20 minutes is passed. After an idle time equal to the timeout value, the operating mode set with the microswitch is re-entered.

This function permits, for example, both teleservice of a S7 controller and dial-up and diagnosis of a connected SCADA system (see Section 4.4.1.3).

3.6 Items supplied

The scope of supply of the TS 300 includes:

!

To use the TS 300 on S7-400 systems, an MPI cable is required (see 3.7.3).

- TS 300 ready to operate
- Backplane bus connector
- 3-meter USB cable
- RJ11 connecting cable (2 m)
- TAE connecting cable (2 m)
- 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	900-753-8MD21/en
Manual, English	900-753-8MD21/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

Mounting rack with mounting holes	700-390-1XA04
Mounting adapter for DIN rail	700-390-6BA00
Power supply adapter with plug	700-751-SNT01

    Input: 100-240 V AC / 47-63 Hz / 400 mA

    Output: 24 V DC / 625 mA

MPI connecting cable TS 300, 0.5m	700-753-6VK11
MPI bus extension cable, 5m	700-751-6VK11
MPI bus extension cable, 10m	700-751-6VK21
MPI bus extension cable, special lengths	700-751-6SO11

❗

To use the TS 300 on S7-400 systems, an MPI cable is required.

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 TS 300, a PC or laptop is required with a 32-bit Windows operating system and a CDROM drive. The Windows 2000 and Windows XP operating systems can be used.

In the programming devices or PCs used, there must be one USB interface with the USB 1.1 or USB 2.0 specification. You can also use normal commercial type USB cards.

4.2 Installation of the USB driver

If this is the first time a TS 300 is being connected to the PC, 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 necessary both to use the TS 300 as a local programming interface and to use the modem on the local computer.

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

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

Found New Hardware Wizard

Welcome to the Found New Hardware Wizard

Windows will search for current and updated software by looking on your computer, on the hardware installation CD, or on the Windows Update Web site (with your permission).
Read our privacy policy

Can Windows connect to Windows Update to search for software?

○ Yes, this time only
○ Yes, now and every time I connect a device
◉ No, not this time

Click Next to continue.

[< Back] [Next >] [Cancel]

- 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"*.

Found New Hardware Wizard

This wizard helps you install software for:

USB Serial Port

If your hardware came with an installation CD or floppy disk, insert it now.

What do you want the wizard to do?

◉ Install the software automatically (Recommended)
○ Install from a list or specific location (Advanced)

Click Next to continue.

[< Back] [Next >] [Cancel]

- 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.

Found New Hardware Wizard

Please choose your search and installation options.

⦿ Search for the best driver in these locations.

Use the check boxes below to limit or expand the default search, which includes local paths and removable media. The best driver found will be installed.

☑ Search removable media (floppy, CD-ROM...)

☐ Include this location in the search:

E:\ [▼]   [Browse]

○ Don't search. I will choose the driver to install.

Choose this option to select the device driver from a list. Windows does not guarantee that the driver you choose will be the best match for your hardware.

[< Back]   [Next >]   [Cancel]

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

Found New Hardware Wizard

Please wait while the wizard searches...

SSW7-USB

[< Back]   [Next >]   [Cancel]

If the driver is found, a WindowsXP logo compatibility query appears.

- Confirm with the button "*Continue installation*". The driver is then installed.
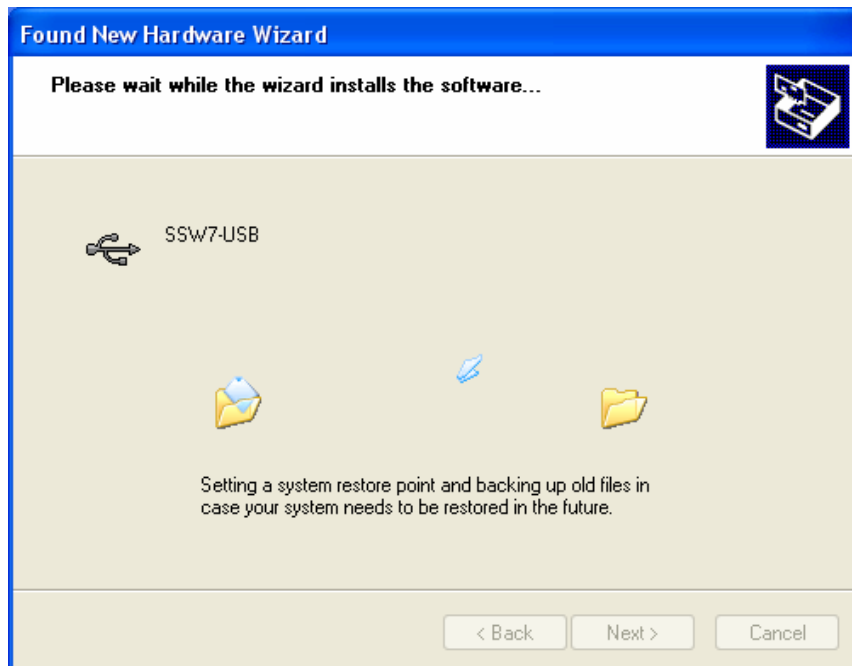
- After successful installation, the operation is completed by clicking the "*Finish*" button.
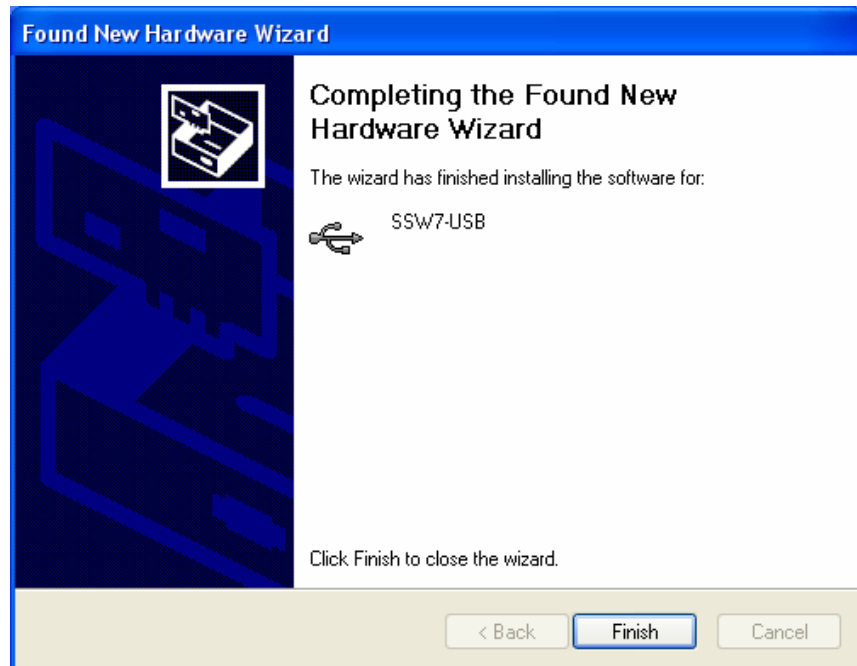
- The operating system starts the installation wizard a second time to install the virtual COM port driver, too. The installation routine is identical to that described above.

- A new COM port is now added in the device manager.
  This must be used as the access path in the programming device or PC interface.

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 TS 300 has to be installed on the PC for each USB interface.

4.3   Installation of the modem driver

If the modem of the TS 300 is to be operated directly on a programming device or PC via USB, the corresponding modem driver must be installed. For this purpose, the micro-switch must be put

in the central position "*MDM*" and the USB cable plugged into the TS 300.

- The operating system starts an installation wizard that performs the installation, which is largely automatic.
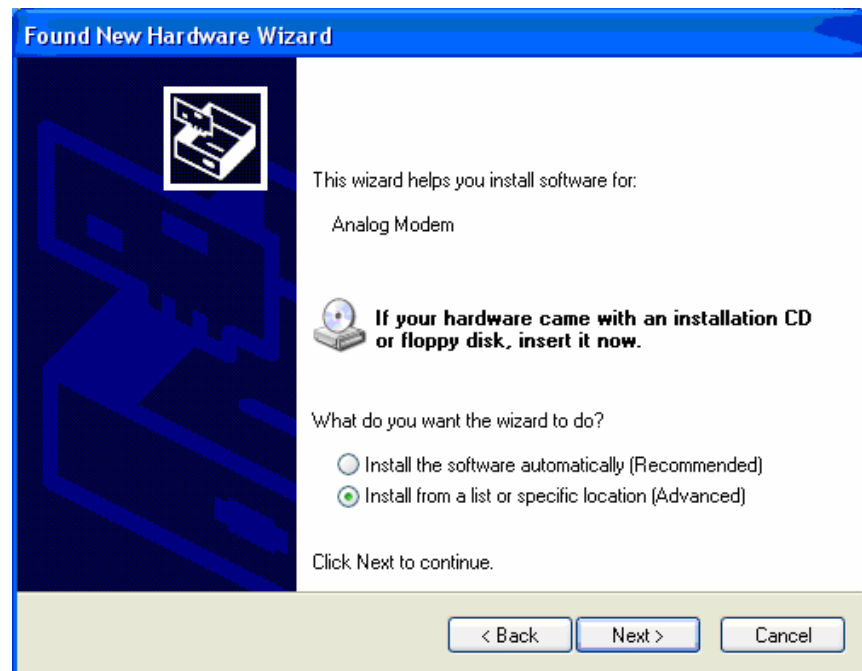
- The next step is a prompt to specify the location of the driver. It is generally enough to set a checkmark next to "*Search removable media…*" and then to click the "*Next*" button.
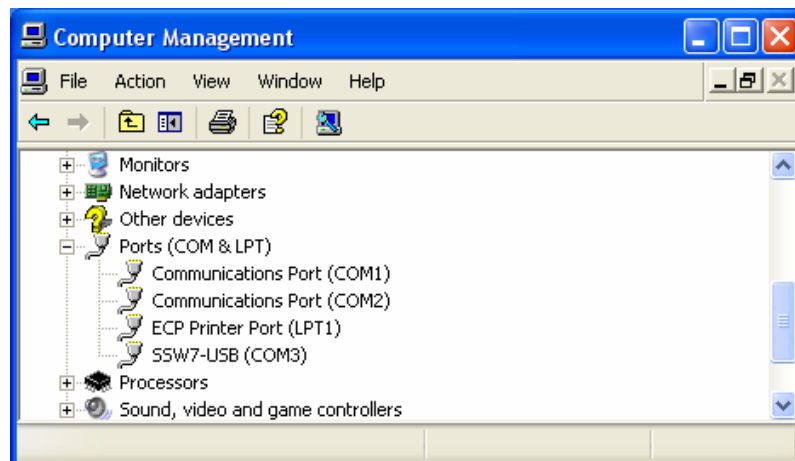
- If the SSW7-Teleservice-Modem CD is in a local drive, the search for the driver now begins.

Found New Hardware Wizard

Please wait while the wizard searches...

SH Modem 56k

[< Back] [Next >] [Cancel]
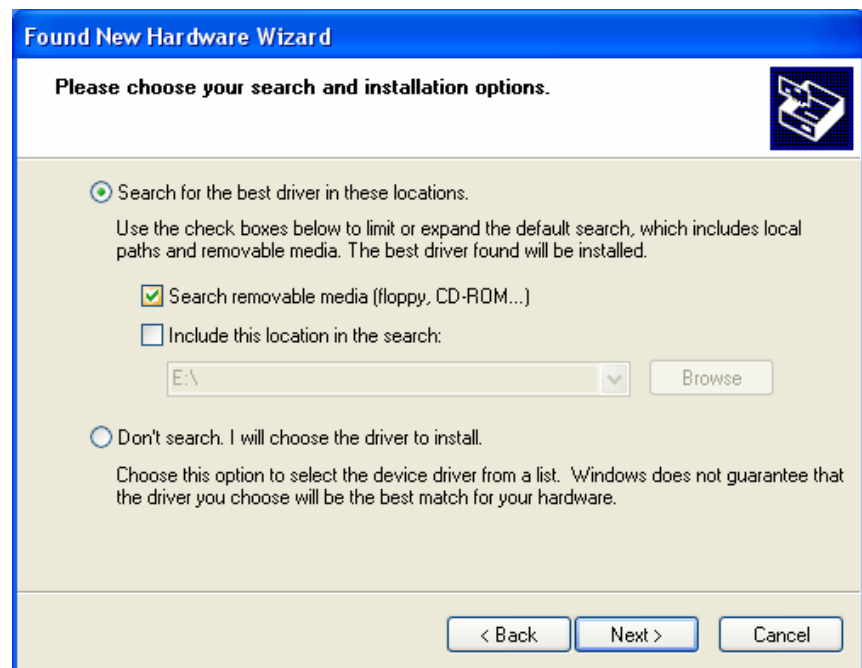
- During installation, a WindowsXP logo compatibility query appears.

Hardware Installation

⚠ The software you are installing for this hardware:

SH Modem 56k
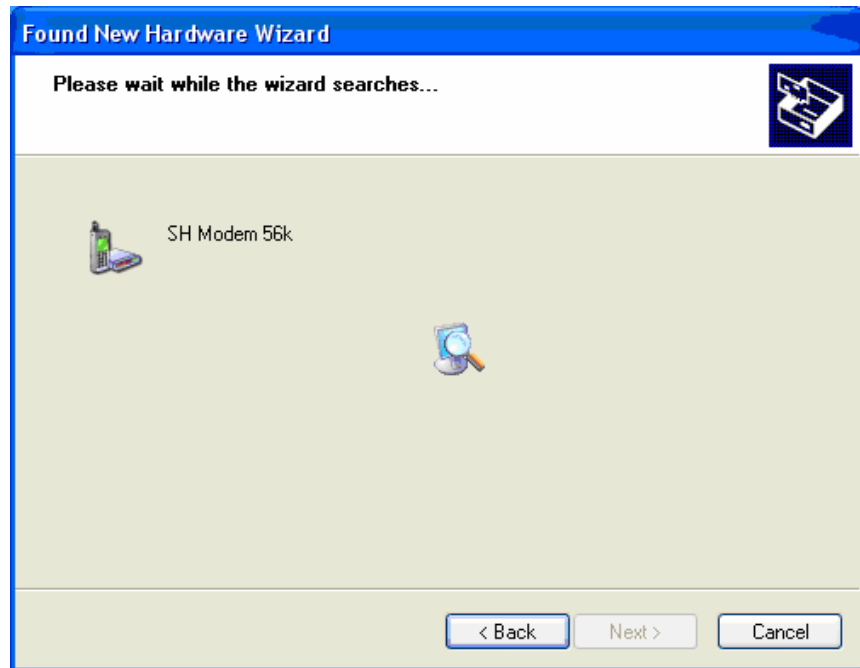
has not passed Windows Logo testing to verify its compatibility with Windows XP. (Tell me why this testing is important.)

Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the hardware vendor for software that has passed Windows Logo testing.

[Continue Anyway] [STOP Installation]

- Confirm with the *"Continue installation"* button
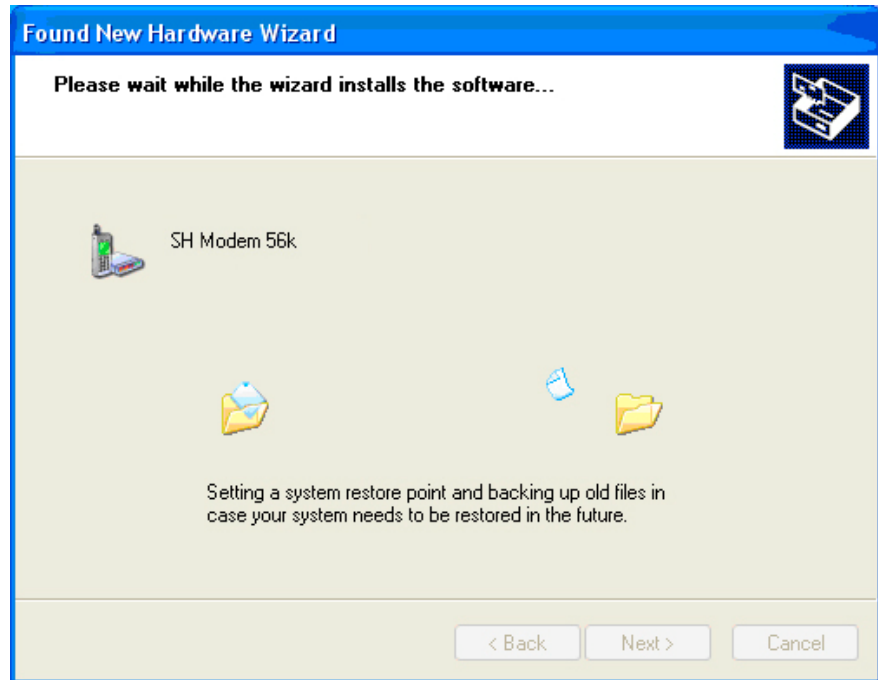
- After successful installation, the operation is completed by clicking the "*Finish*" button.
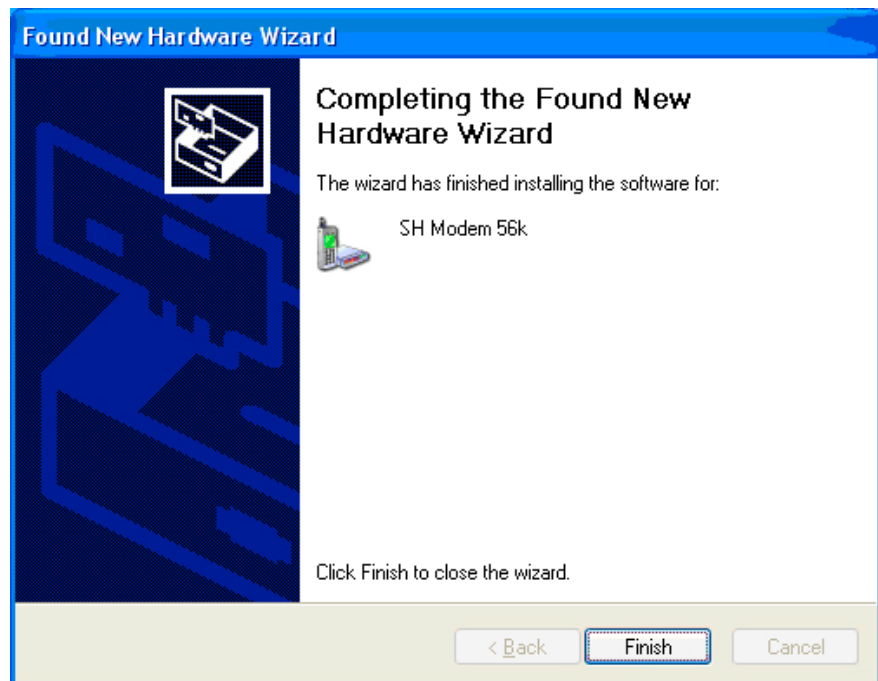
- A new modem with the corresponding COM port is now added in the telephone and modem options.

The TS 300 can now be used as the local modem for a telecommunication link. Moreover, update and parameterization functions to the modem can be used.

4.4 Service tools

4.4.1 Parameterizing and updating with SHTools

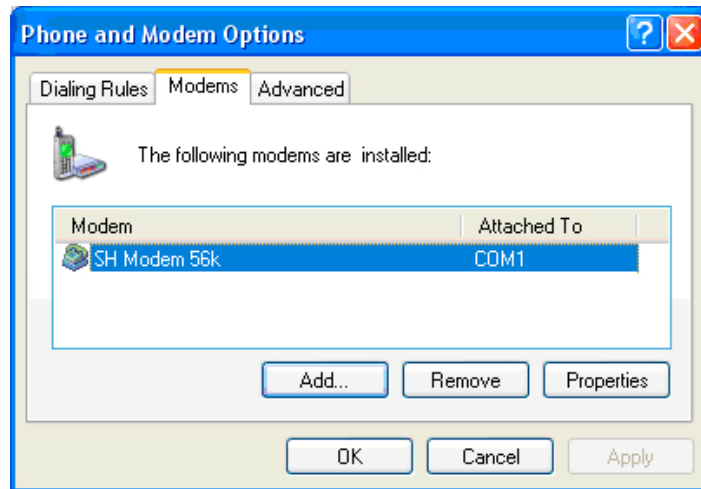With the SHTools software, it is possible to perform a system update of the TS 300, if required. The TS 300 can also be pre-parameterized with SHTools without the TeleService software having to be installed on the computer. SHTools also provides tools for using the additional functions in the TS 300.

The tool is freeware and has been tested under Windows XP and 2000. 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.

4.4.1.1 Firmware update

If required, it is possible to update the operating system of the TS 300 locally or via modem link.

For the local update, a link must be established between the TS 300 and a USB interface on the PC on which SHTools is installed. The micro-switch on the TS 300 must be put into the *"PC"* position. The *"PC"* operating mode is indicated by the lit green *"PC"* LED.

For the remote update of a ready-to-run TS 300, an analog 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.
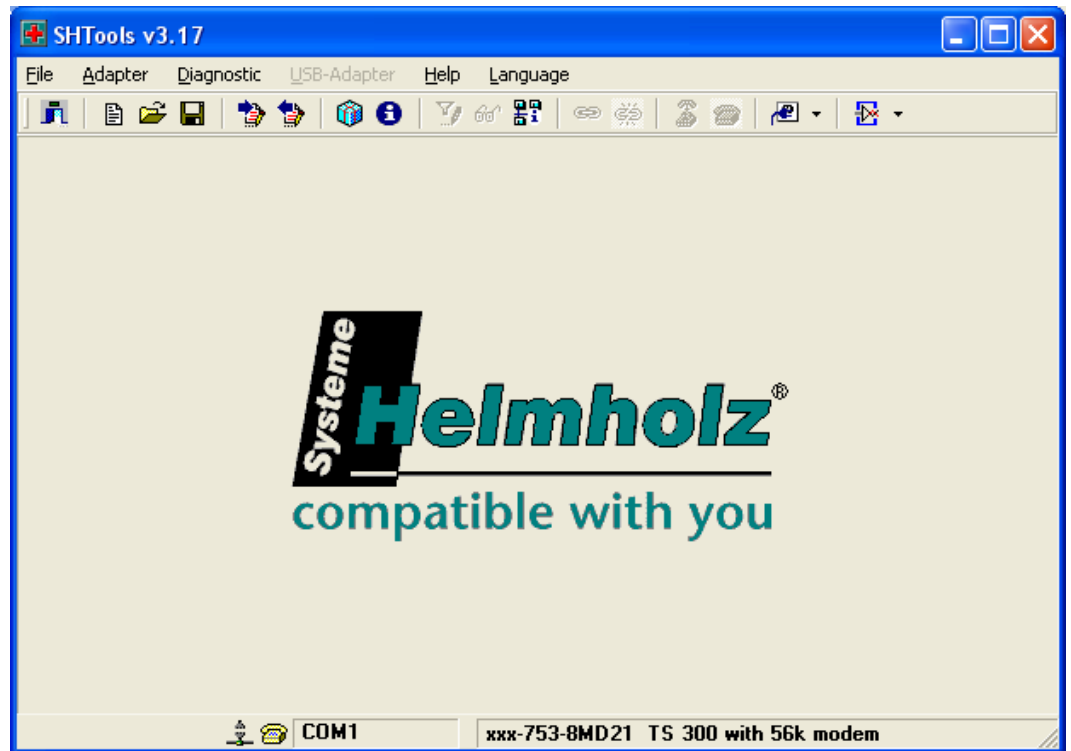
- Via menu item "*Adapter / … select*", the required device is selected by its order number (in this case, the TS 300 with an analog modem).

- 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).
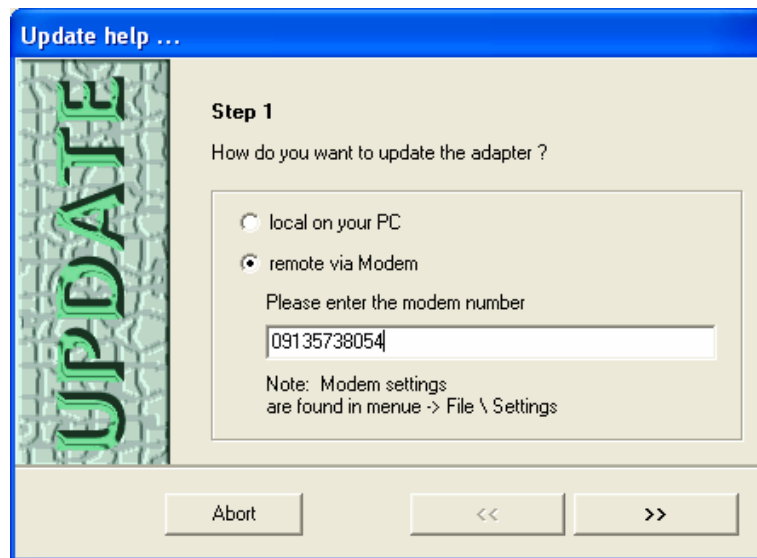
- After step 1 is confirmed, an attempt to establish a link to the TS 300 follows. If this is successful, updating of the firmware sections, of which later versions are available, begins automatically.

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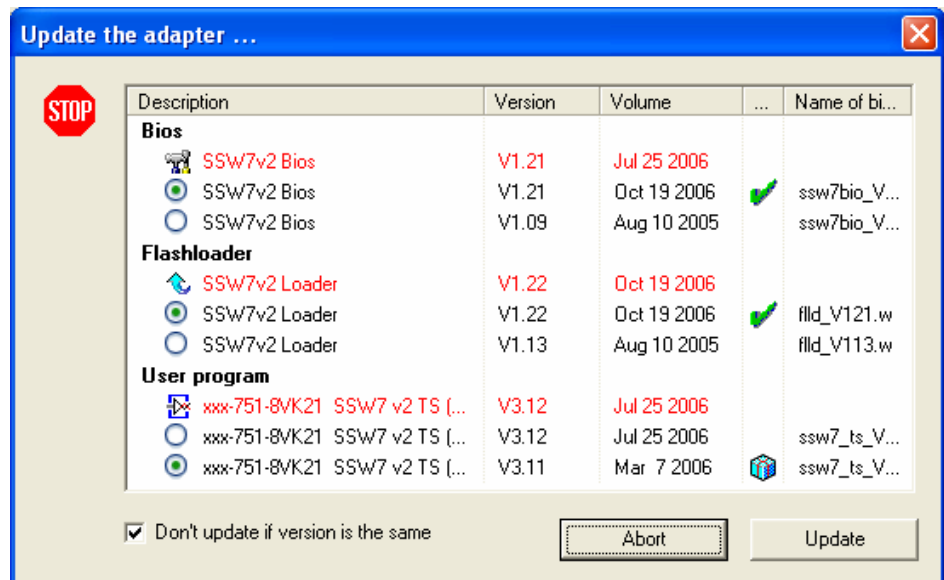
Transmission of the new firmware can take several minutes depending on the transmission rate of the link and must not be interrupted!

For updating via modem link, up to three automatic dial-up operations are required.

- Step 4 shows that the update has been successful.
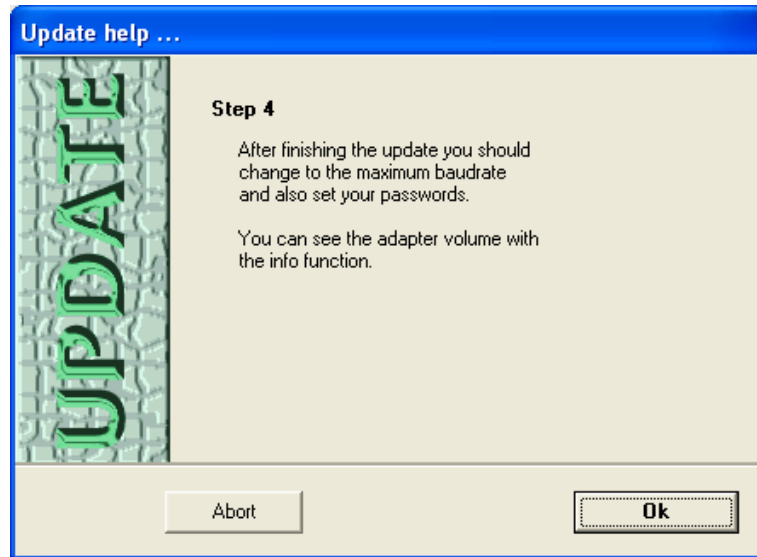
- If the update is performed locally, the current version of the imported firmware can be read with menu item *"Adapter / Read out information from the adapter"*.
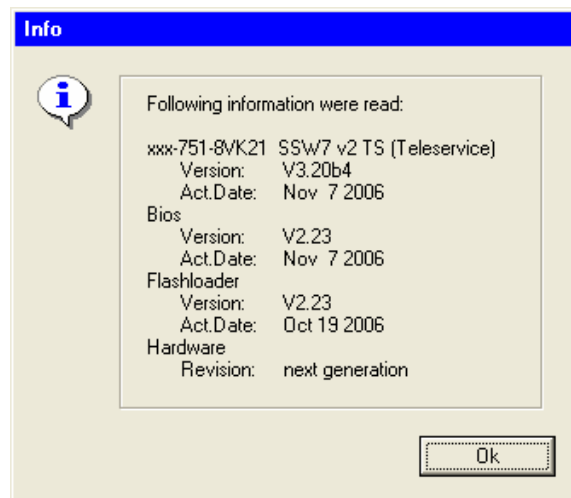
4.4.1.2 Parameterization with SHTools

SHTools is an alternative to the TeleService software for parameterizing the TS 300.

Once TeleService parameters have been set, they can be stored on the computer in a file and can, for example, be transferred to further TS 300s or conventional TS adapters such as the SSW7-TS.

For parameterization, a link must be established between the TS 300 and a USB interface on the PC on which SHTools is installed. The micro-switch on the TS 300 must be put into the *"PC"* position. The *"PC"* operating mode is indicated by the lit green *"PC"* LED.

With the "*Adapter / Read parameters*" menu item, it is possible to read the current parameterization out of the TS 300.

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-specific parameters
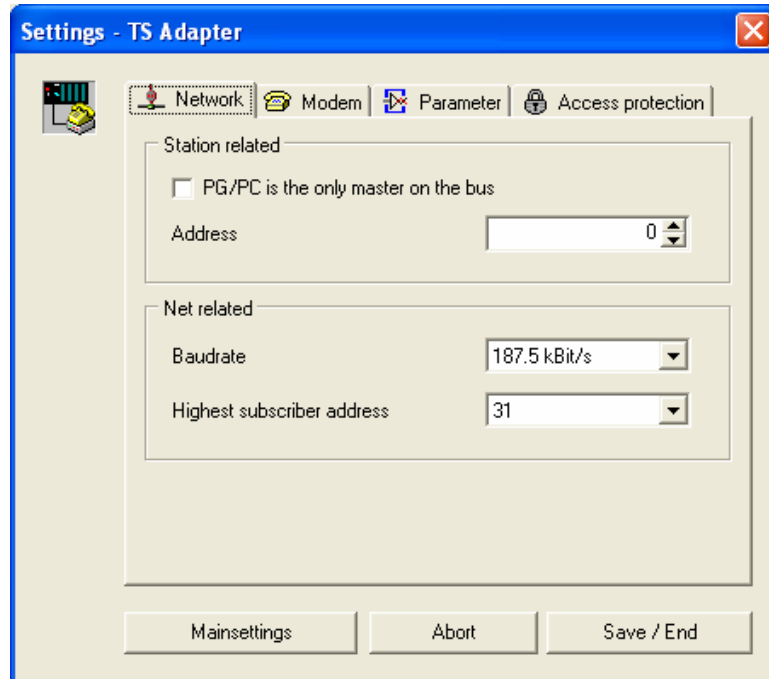
- Setting the modem-specific parameters

!

The command data may lead to undesirable behaviour when sending alarm messages (see Troubleshooting). The following adjustment is necessary:

ATE1L1M1Q0V1&C1S0
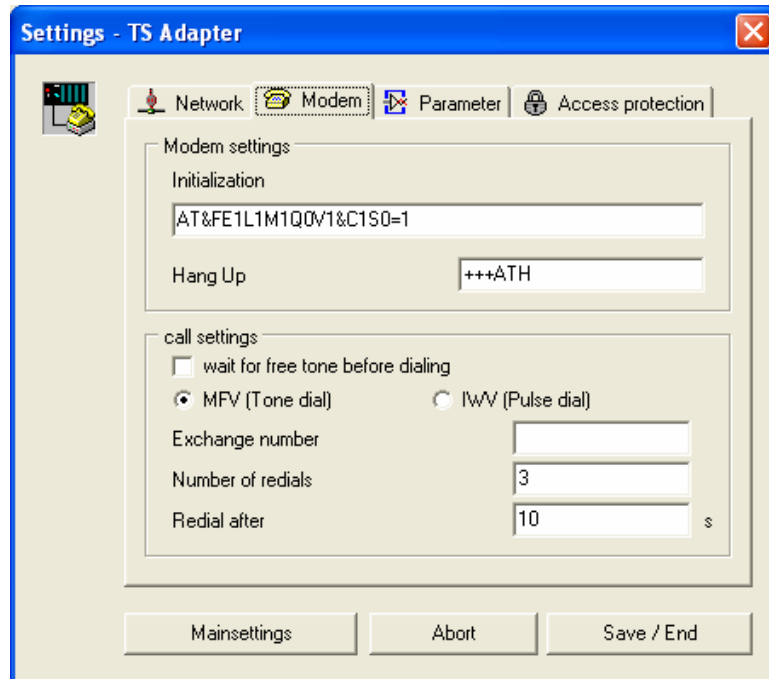
- Setting the transmission rate between the modem and TS 300
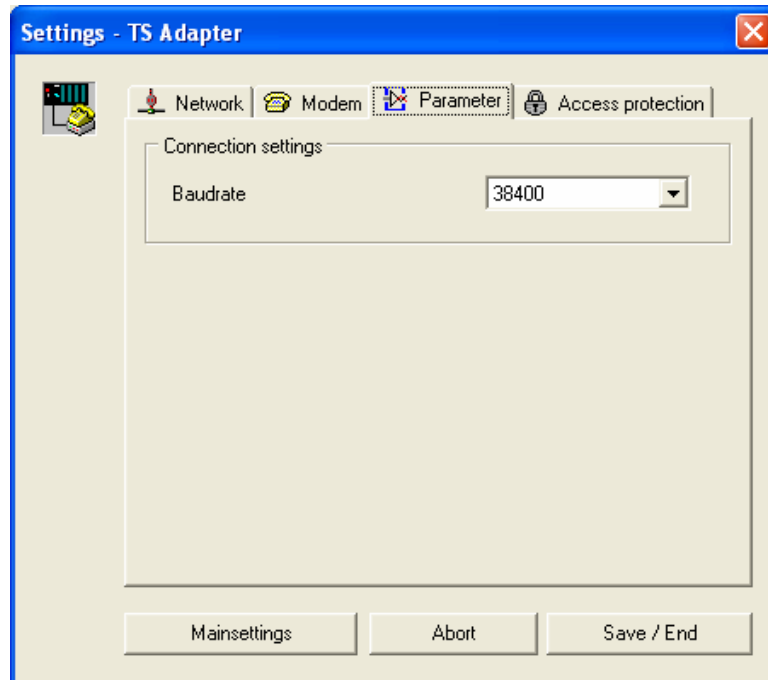
- Setting the access protection for remote access
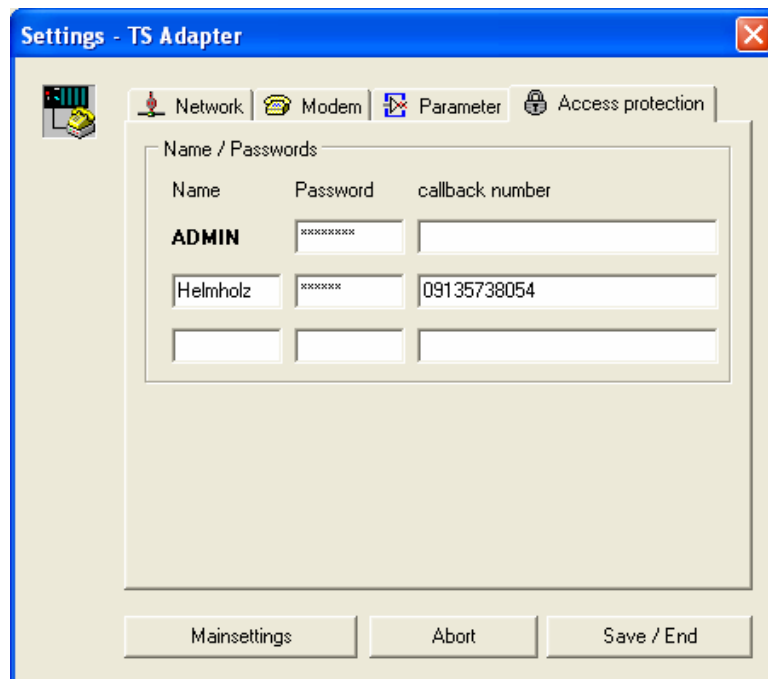
With the "*Save / End*" button, the edited contents of the four tabs are transferred to the TS 300.

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.

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.
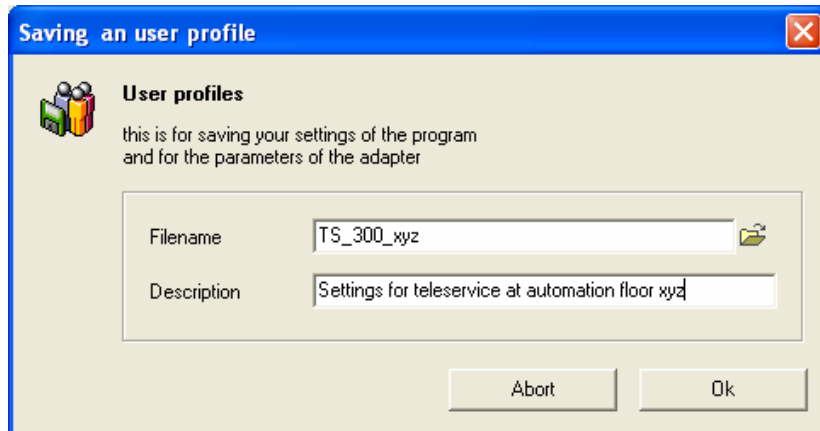
To open a user-defined profile, choose the menu item *"File / Open profile"*. In the "*Loading a user-defined profile*" window, which then opens, you can select the required profile.
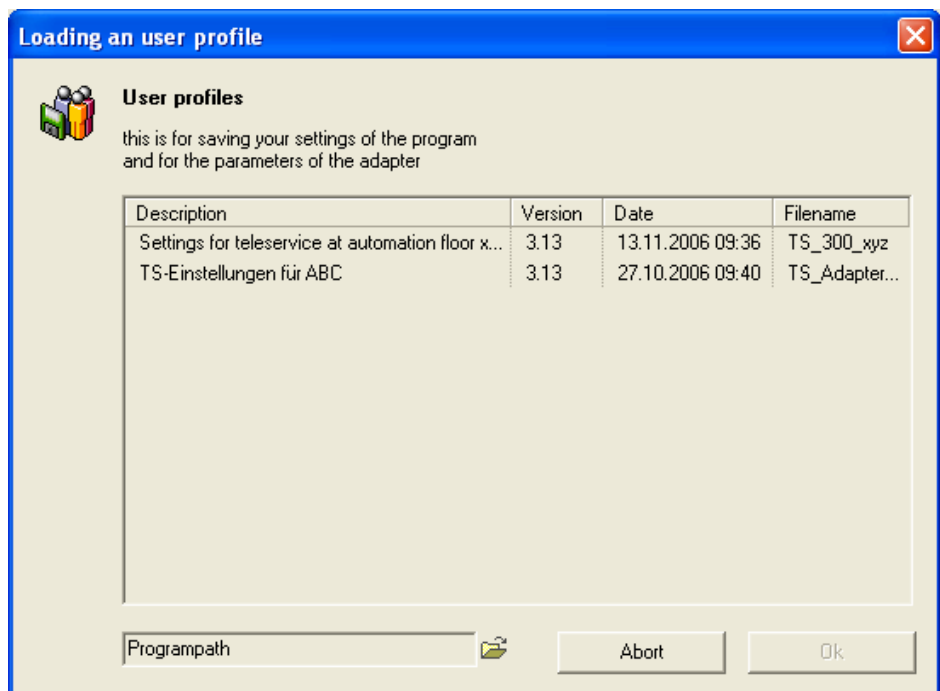
With the "*Adapter / … Settings*" menu item, it is possible to view and change the current profile.

4.4.1.3 Switching routes and outputs

One special function of SHTools is support for switching TS 300 functionalities via a modem link, or locally via the USB port.

For remote access, a GSM or an analog modem is required, which can be addressed via a COM port of the local computer.

After selection of the "*Adapter / Control routes/outputs*" menu item, it is possible to define the access path in step 1 (local or remote).
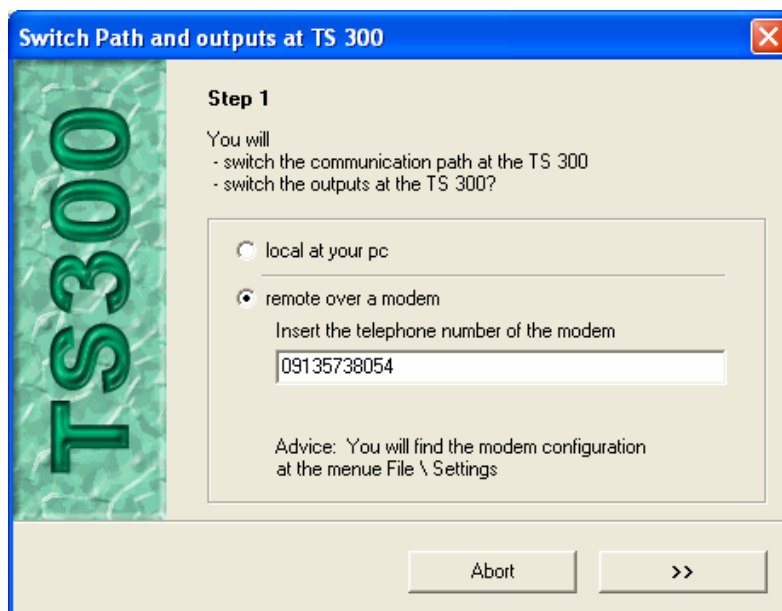
After the link to the TS 300 has been established, a selection window appears in which control functions can be selected (depends on the type of access).
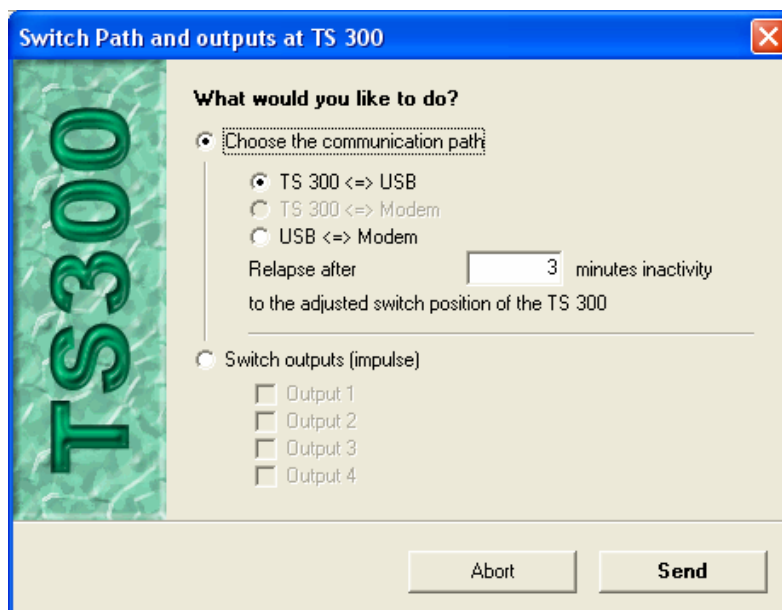
In this way, the communication route can be changed, or the outputs of the modem switched.

- If the communication route is changed, the fallback time after inactivity can be freely selected in the range one minute to 20 minutes.
  The fallback time is stopped by any communication and reset when communication ends. This permits several communication runs in succession without any further intervention.
  The action is performed with *"Transmit"*.

By operating the micro-switch for the operating modes of the TS 300, it is possible to overwrite mode settings made in the software locally at any time.

Note the special function of output 1!

- The outputs that are reflected on the IO image on the back-plane bus of the TS 300, can optionally be switched individually or together.
  The switching pulse lasts for approx. two seconds. After the pulse, the link is closed again.

4.4.1.4 Parameterization of the alarm messages

The TS 300 is able to transmit two alarm messages in the form of an SMS. For this purpose, the corresponding output is set in the user program of the connected S7-300. This is processed by the TS 300 in DEA mode on a rising edge.

Parameterization of the alarm functionality is only possible locally.

To be able to use this functionality of the TS 300, local parameterization via the USB interface of the TS 300 using the SHTools is necessary.

After you have started the SHTool and selected both the correct adapter and the correct communication port, you can read out the current configuration of the alarm functionality via menu item "*Store adapter / texts in the modem*".

The first time you confirm or if the alarm functionality is inactive, the following dialog box appears:

After the alarming function has been enabled, you can state a service number and configure the two alarm messages as you required.

Message and telefonnumber saved in TS300

Standard settings

Alerting   Alerting switch ON

Service   Vodafone   Service Center   01722270000

Maybe set char for line before the number

Alarmmessage 1

Telefonnumber   491726059396

Message   ALARM in area 51

machine stopped in plant 121

reset   Remaining chars: 103 / 11

Alarmmessage 2

Telefonnumber   491728345399

Message   ALARM in area 51

oil pump overheat

reset   Remaining chars: 103 / 22

State: Modem data have been read

set default   read in   set   quit

Please note that the two alarm messages have a general and an alarm-specific message text. The general text is identical with the two alarm messages.

The required parameterization is stored permanently by pressing the "*Set*" button.

Activation of the alarm inputs by a user program in a S7-300 controller is described in Section 7.1.1.

5 Operation on a programmable controller

There are different ways of connecting the TS 300 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 TS 300 offers the option of communicating with the modem via the USB interface. The MPI functionality of the TS 300 is deactivated in this case.

5.1 MPI modes

The TS 300 permits MPI communication either only via the MPI socket accessible on the front or also via the backplane bus of an S7-300 controller.

5.1.1 MPI mode via the front MPI socket

In DIP switch position "ON" for MPI, do not use the front MPI connector of the TS 300.

Irrespective of the DIP switch "*MPI*", the front MPI socket is always active.

For communication between TS 300 and an S7-300 or S7-400 CPU, a PROFIBUS or MPI cable is used to interconnect the communication components.

Systeme Helmholz GmbH offers a 50-cm MPI connecting cable made up especially for the TS 300 (see Section 3.7.3). But any PROFIBUS connecting cable can be used.

5.1.2 MPI operation via the backplane bus of an S7-300 CPU

If the TS 300 is connected to an S7-300 system via a backplane bus connector, the MPI communication with this CPU can be dealt with via the backplane bus.

In DIP switch position "ON" for MPI, do not use the front MPI connector of the TS 300.

To use this function, the "*MPI*" DIP switch must be in the "*ON*" position. The "*MPI*" LED is then on and green.

In this case, the front MPI interface of the TS 300 should not be used.

MPI components, such as TPs or OPs that are coupled to the same S7-300 system as the TS 300 via a bus cable can also be accessed via the backplane bus of the CPU, if none of the following CPUs is used.

Special aspects of the MPI backplane bus can cause problems with the CPUs listed.

- S7-315 (only models with Profinet interface)
- S7-317 (all models)
- S7-318 (all models)
- S7-319 (all models)

If one of the above CPUs is used, do not use the MPI functionality on the backplane bus, as this can lead to complications.

5.2 USB direct operation on a programming device/PC

To be able to use the TS 300 like a local TS adapter, in addition to the existing USB link to the local computer, the micro-switch for the operating modes must be in the "*PC*" position. The LED with the name "*PC*" is lights up green in this switch position.

The TS 300 can also be operated locally as a PC adapter. The Tele-Service software does not need to be installed on every PC with local access to the TS 300.

5.3 Modem operation in a telephone network

To use the TS 300 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 "*MOD*" and "*PC*" LEDs going out.

On the local computer that is to communicate with the TS 300 via a telephone link, a functioning modem link to the outside world and, for example, the TeleService software from Siemens are required.

5.4 USB-to-modem operation

To use the modem of the TS 300 as a simple analog 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 "*MOD*" LED.

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

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

6 Configuration of the Simatic tools

6.1 TS 300 in direct operation

The TS 300 is connected with the programming device or PC for direct operation via the USB cable supplied.

If the micro-switch is in the "*PC*" position, which is indicated by a green "*PC*" LED, the TS 300 is used as a TS adapter in direct operation or as a PC adapter.

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 can always be used for direct operation.
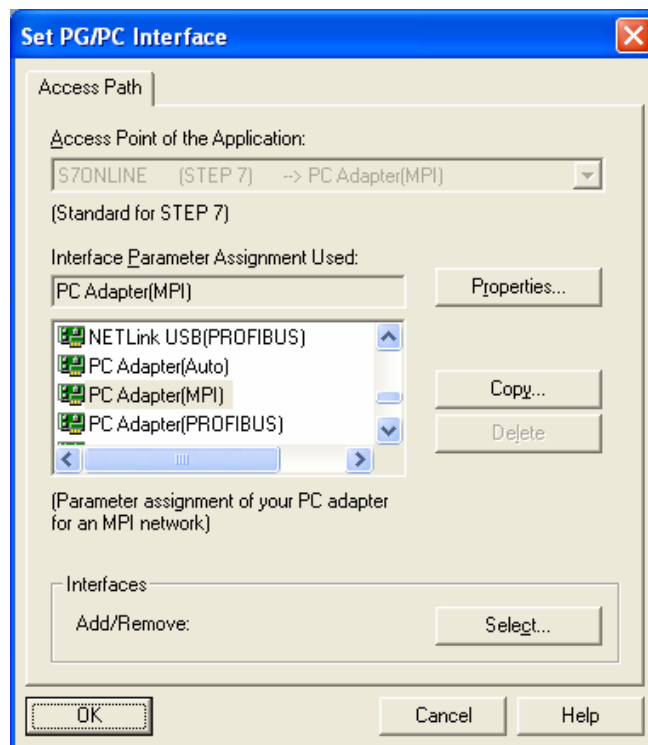
Under *"Properties"*, the MPI settings and the COM port have to be changed before first use.
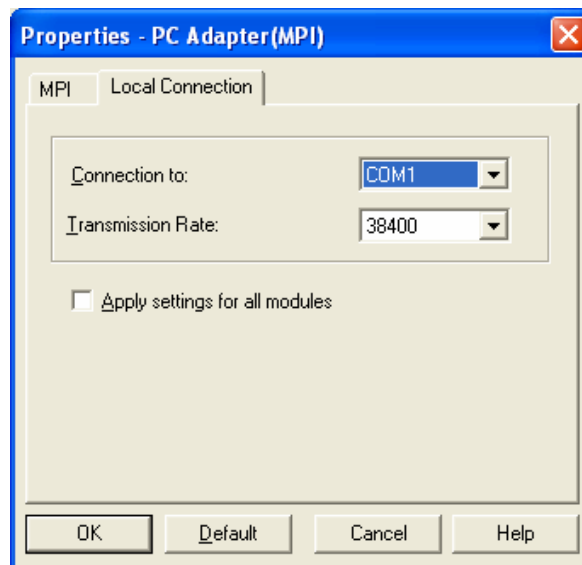
6.2　TS 300 for teleservice (modem operation)

To select a TS 300, an analog 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.
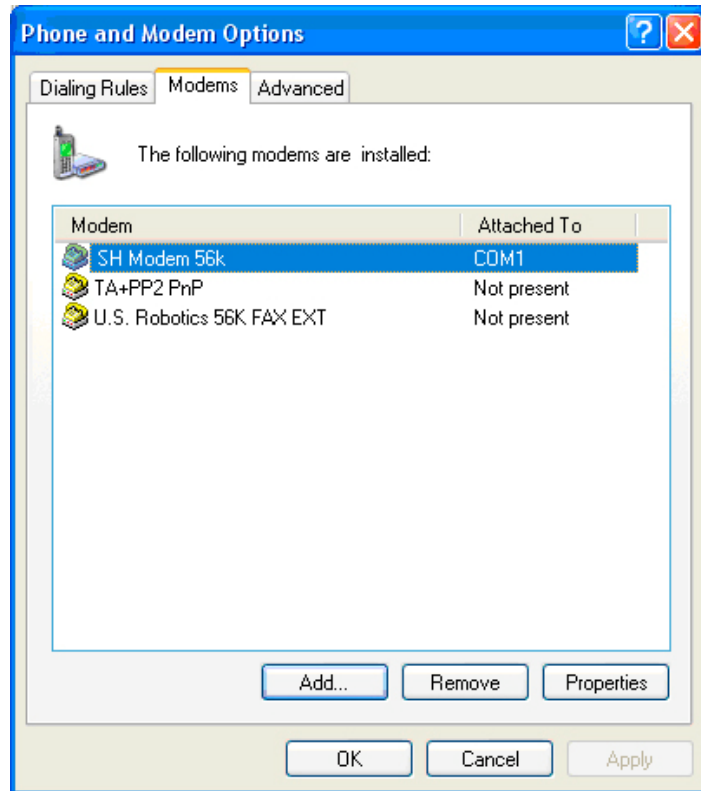
It should be possible to address the modem as soon as you have installed it on one of the COM interfaces of the programming device or PC. It can then be selected in the parameterization of the programming software.

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 TS 300

On the TS 300, the micro-switch position *"TS"* is set, which is indicated by the *"MOD"* and *"PC"* LEDs going out.

When the device is supplied with power only the *"PWR"* LED and, after some time, also the *"ACT"* LED should be active. The TS 300 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 TS 300 for this.

If no further user-specific settings have to be made, the TS 300 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

!

When the "PWR" and "ACT" LEDs are on, the TS 300 is ready to accept a call.

remote programmable controller after selecting the TS 300 through TeleService.
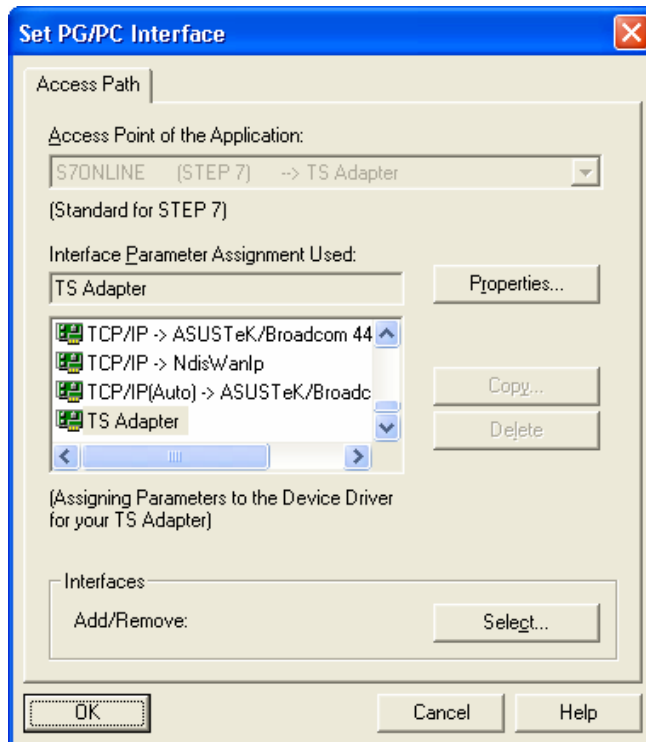
For teleservice, the "*Modem connection*" mode must be selected on the "*Local connection*" tab card in the properties of the TS adapter.
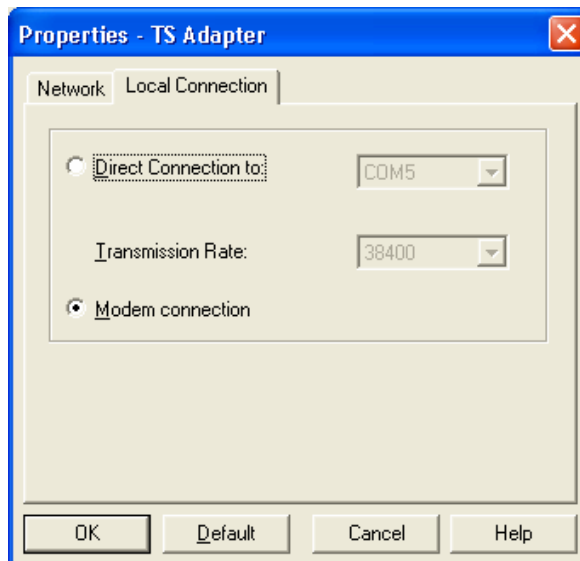
6.2.3 Settings through TeleService

For teleservice, you will also need an additional software module for your programming software, e.g. TeleService from Siemens (version 3.0 and later), to establish a link and manage further links (telephone book of stored systems).
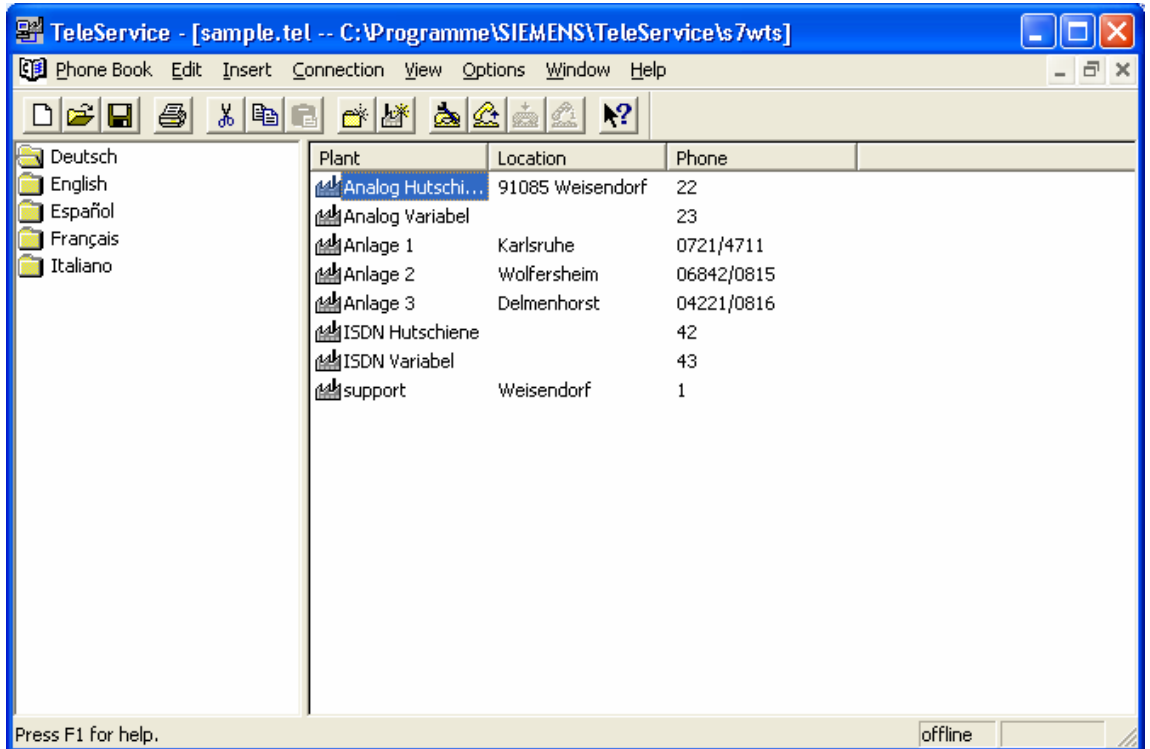
After you have created a telephone book entry for a system, a telecommunication link can be established via the telephone network.
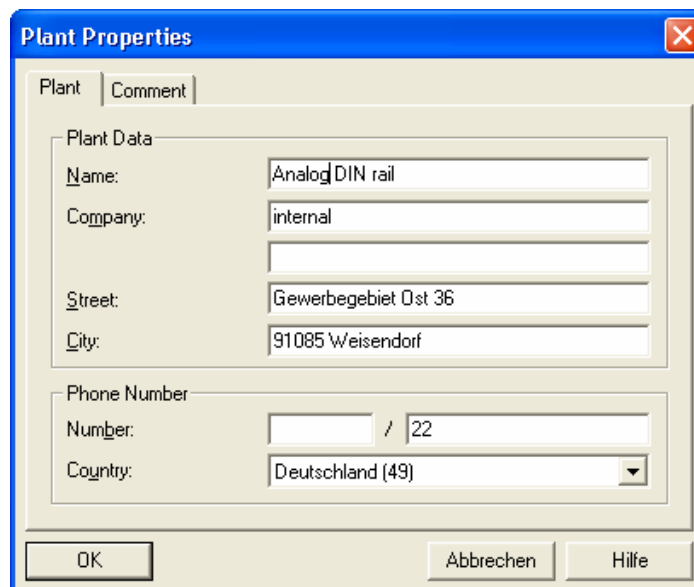
System or network-specific settings of the TS 300 can be made with the TeleService software or SHTools (see 4.4.1.2).

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

Via the SHTools, parameterization can only be performed locally.

Direct (local) parameterization using the USB cable supplied on the programming device or PC interface and the TeleService software is described below.

The micro-switch on the TS 300 must be in the "*PC*" position, which is indicated by the lit green "*PC*" LED.

In the TeleService software, the settings for the TS 300 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.

6.2.3.1 Bus parameters

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

Please note that the TS 300 is only suitable for the network type "*MPI*" and transmission rates "*19.2 kbps*" and "*187.5 kbps*".
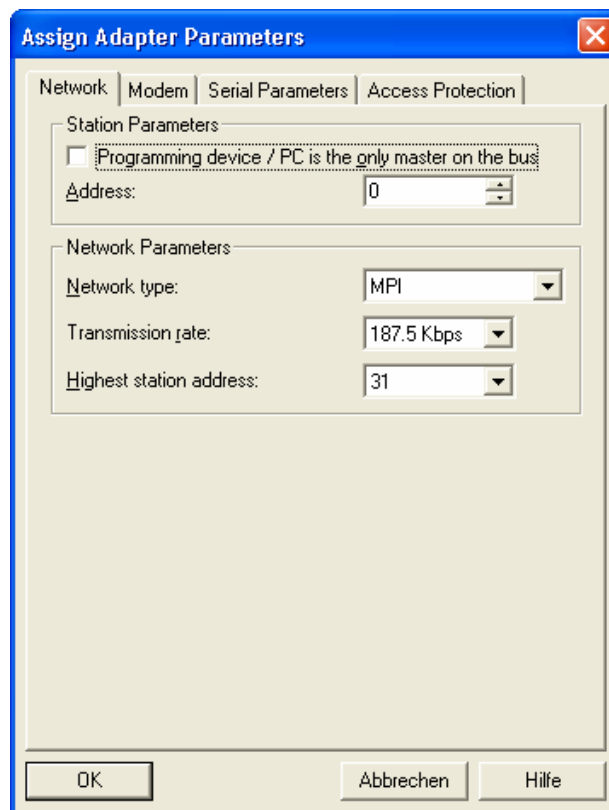
It may be necessary to redial the controller via a telecommunication link after making a change.

The settings for

- Network type

- Transmission rate

- Highest station address

must match the hardware configuration of the connected CPU. Moreover, the TS 300 should be assigned an MPI address that has not yet been assigned in the MPI network.

6.2.3.2 Modem parameters

The "*Modem*" tab of the "*Parameterize adapter*" window contains all modem-specific parameters that can be influenced.
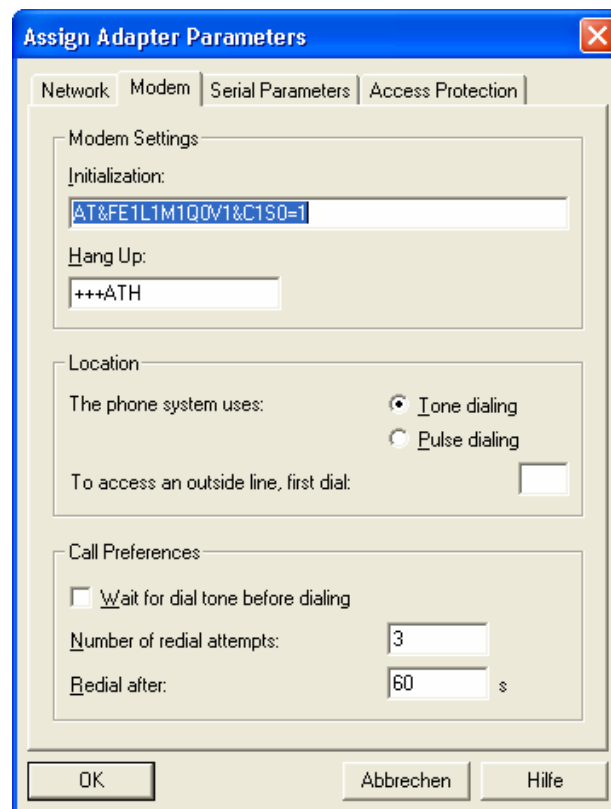
The internal modem of the TS 300 is initialized automatically after switch-on. For this purpose, the initialization string is sent to the modem so that it can make settings.

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 TS 300 is prepared for use abroad, it is advisable to adapt it using the relevant country code. This makes specific settings for the public telephone network in that country (for example, voltage adaptation, waiting times during the handshake procedure signal level, etc.).

The following command characters are appended to the initialization string:

+GCI=xx

"*xx*" stands for the relevant country code (see Section 9.3.1).

The entire initialization string could look something like this:

AT+GCI=FD;E1L1M1Q0V1&C1S0=1

The semicolon is used as the command separator for the preceding command. The semicolon ensures clear separation of the AT commands so that the command sequence is interpreted unambiguously.

The semicolon can also be used as a separator for other commands.

For further information on AT commands see the appendix (see Section 9.3.2).

!

FD is only an example in this case. The correct two-character country code for the destination country must be entered!

6.2.3.3 Serial parameters

The "*Serial parameters*" tab of the "*Parameterize adapter*" window contains all parameters for serial communication that can be influenced.
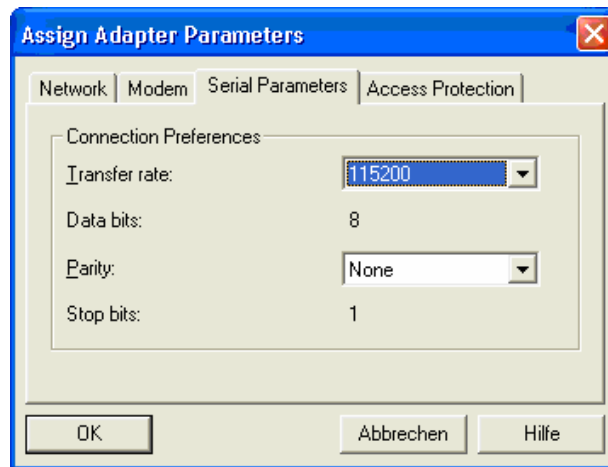
6.2.3.4 Access protection and the call-back function

The "*Access protection*" tab of the "*Parameterize adapter*" window contains all user-specific parameters that can be influenced. Via this tab card, the TS 300 can be configured to permit teleservice via the TeleService software only with the relevant authorization.
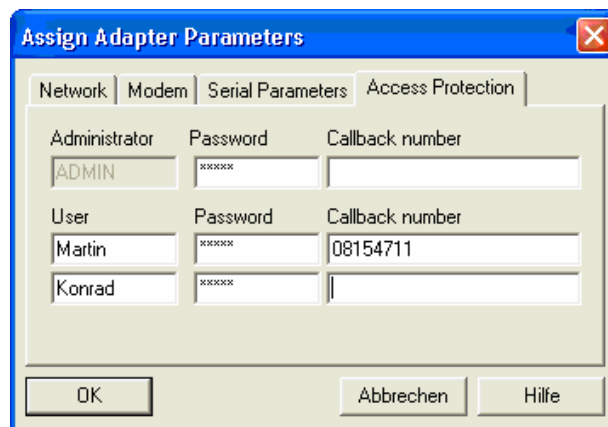
Please note that "*Users*" created via a telecommunication line can only reparameterize their own access account. The administrator, on the other hand, can change all three user accounts via a telecommunication link.

If an incorrect call-back number is saved under the user "*ADMIN*", it will be very difficult to reparameterize the TS 300 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.

!

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

7   IO functionality of the TS 300

If the TS 300 is implemented as a digital IO module in the hard-
ware configuration of an S7-300, 16 inputs and 16 outputs are
available for service and parameterization purposes.

In this case, it is necessary to select the module with order num-
ber "*6ES7 323-1BL00-0AA0*" from the hardware catalog and insert
it in the S7-300 project.
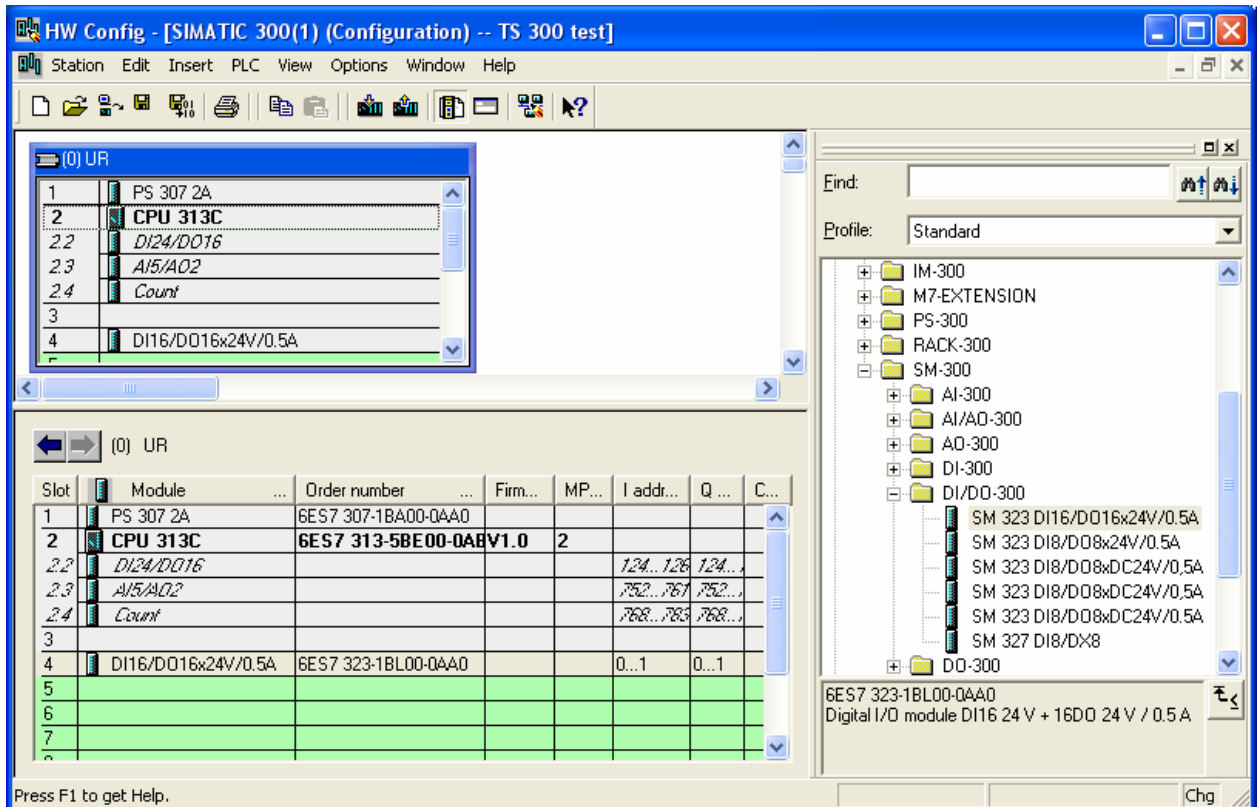
To enable and use the IO functionality of the TS 300, not only
must a DI/DO-16 module be implemented in the hardware con-
figuration, but the "*DEA*" DIP switch must also be put in the
"*ON*" position on the TS 300.

After the DIP switch has been put in the "*ON*" position, the
"*DEA*" LED is lights up green.

Via the available inputs and outputs of the TS 300, functions can
be switched and operating states of the TS 300 and the integrated
modem diagnosed by the user program in the S7-300 CPU.

7.1 Output word of the DIO16

The following table shows which output bits of the CPU trigger functionality in the TS 300.

If output address byte *"0..1"* is assigned to the TS 300 in the hardware configuration,

- output byte *"n"* stands for output address *"0"* and

- output byte *"n+1"* stands for output address *"1"*.

Output byte n	Function	Explanation
Bit 0	For future use	For future applications
Bit 1	For future use	
Bit 2	For future use	
Bit 3	For future use	
Bit 4	For future use	
Bit 5	For future use	
Bit 6	Modem input 1	"1" activates alarm message 1
Bit 7	Modem input 2	"1" activates alarm message 2
Output byte n+1	Function	Explanation
Bit 0	Modem reset	"1" activates a modem reset
Bit 1	For future use	For future applications
Bit 2	For future use	
Bit 3	For future use	
Bit 4	For future use	
Bit 5	For future use	
Bit 6	For future use	
Bit 7	For future use	

7.1.1 Alarm inputs of the TS 300 (= outputs of the CPU)

The internal modem has two digital inputs that are activated with the appropriate program connection in the S7-300 controller through the output bits of the CPU.

The input signal for outputting the first alarm message must be pending at alarm input 1 for at least four seconds before the pre-defined alarm message is processed.

The input signal for outputting the second alarm message must be pending at alarm input 2 for at least four seconds before the pre-defined alarm message is processed.

An alarm message and a receiver can be assigned to each of these two alarm events (see Section 4.4.1.4).

In alarm SMS transmission, the connection is ended as soon as the SMS has been transmitted.

7.1.2 Further functions of the output word

If required, a modem reset can be initiated via bit 0 of output byte n+1 by applying a 1. This can be useful, for example, for parameterization using third-party tools.

Further functionalities are currently not implemented.

7.2 Input word of the DIO16

The following table shows which input bits of the CPU function-ality/status information are mapped by the TS 300.

If input address byte "*0..1*" is assigned to the TS 300 in the hard-ware configuration,

- input byte "*n*" stands for input address "*0*" and
- input byte "*n+1*" stands for input address "*1*".

Input byte n	Function	Explanation
Bit 0	/Data valid	If an internal TS 300 communication error has occurred, this bit is set to '1' and all other bits are set to '0'.
Bit 1	For future use	For future applications
Bit 2	For future use	
Bit 3	For future use	
Bit 4	Output 3	"1" output 3 of the TS 300 is set
Bit 5	Output 4	"1" output 4 of the TS 300 is set
Bit 6	Output 1	"1" output 1 of the TS 300 of the modem is set
Bit 7	Output 2	"1" output 2 of the TS 300 of the modem is set
Input byte n+1	**Function**	**Explanation**
Bit 0	Power LED	The TS 300 is powered and ready for opera-tion
Bit 1	Active LED	The TS 300 is actively signed on to the MPI bus
Bit 2	Connect LED	The TS 300 communicates via MPI
Bit 3	OH-LED	The connection with the remote station is initiated
Bit 4	DCD-LED	Modem ready for transmission of useful data
Bit 5	TS 300 ⇔ USB	TS 300 in "PC" operating mode; "MDM" LED is on and green
Bit 6	TS 300 ⇔ Modem	TS 300 in "TS" operating mode; "MDM" LED is off
Bit 7	USB ⇔ Modem	TS 300 in "MDM" operating mode; "MDM" LED is on and red

7.2.1 Internal communication error

If a communication error has occurred in the TS 300 (e.g. hard-ware error, CRC error, …), the *"/Data valid"* bit is set, while all other input bits of the PLC (= output bits of the TS 300) are reset to "*0*".

7.2.2 Outputs of the TS 300

The TS 300 has four digital outputs that can influence a user pro-gram in the S7-300 controller. This enables you to implement re-mote control using the SHTools (see Section 4.4.1.3).

Please note that output 1 of the TS 300 (input of the S7-300) is automatically closed while a pulse alarm is being processed.

!

Note the special function of output 1!

7.2.3 Operating status of the TS 300

The LEDs for status display of the TS 300 (*"PWR"*, *"ACT"*, and *"CON"*) are reflected on the backplane bus and can be evaluated by the user program of the S7-300 controller.

7.2.4 Status of the interface

If the internal modem of the TS 300 is involved in the current communication, the status of the *"DCD"* LED and the *"OH"* LED (off-hook LED) is transmitted to the backplane bus.

The status display for the micro-switch positions and the active operating mode can be evaluated in the user program of the S7-300. The status is also visible on the *"MOD"* and *"PC"* LEDs on the TS 300.

If the operating mode is set for a limited time using the SHTools, the currently active operating mode is shown on the backplane bus and on the status LEDs (virtual switch position).

8   Troubleshooting

The points described here show some typical errors that can occur in day-to-day work with the TS 300.

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 installed the USB driver for the TS 300 to use directly on my PC.
COM port "*9*" that I selected is displayed on the programming device/PC interface. Unfortunately Step7 does not work with the TS 300.

A: The programming device/PC interface displays all available COM ports but only works reliably with the first eight.
Please set the COM port you are using manually to a COM port less than or equal to "*8*" in the device manager to ensure the function works.

Q: I have deposited SMS texts within TS 300 und switched the micro switch on TS function. When setting the respective output bit of the CPU the OH-LED goes on for a short time, but the text message is not being transferred.

A: You have to deactivate the preset adjustment "*Waít for dial tone before dialing*". This happens with help of the initialization string (see Section 4.4.1.2 and 6.2.3.2). With the described settings the default value ATX4 won´t be transferred into the modem anymore. After making the changes, the set texts and phone numbers need to be transferred again into the TS 300 using SHTools (see Section 4.4.1.4).

Q: The link sporadically breaks off on my computer with the operating system Windows 2000.

A: For reliability reasons, "*Forced EC*" error detection must always be activated on your local modem. In a link without error checking, sporadic broken connections can occur!

The following settings must be made in the modem properties of the TeleService software:
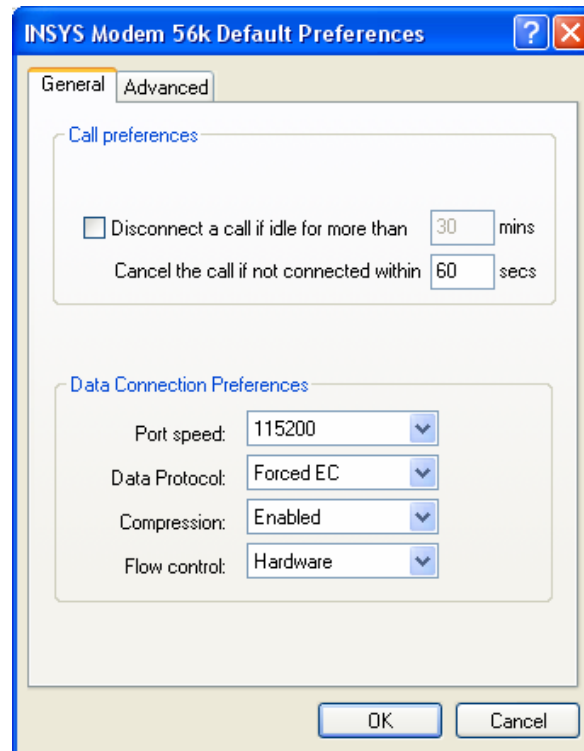
Q: I use a laptop with an internal modem as my programming device. Broken connections occur again and again during teleservice with the TeleService software.

A: The standards (e.g. V.34 for links up to 33,600 baud) require a constant carrier frequency. Some laptop soft modems do not comply with the standards in this respect.

Laptop modems are primarily designed for dialing into the Internet via various providers. The Internet providers provide a precise reference frequency with a master clock so that a variable modem link hardly causes problems.

Broken connections with soft modems depend on the design of the laptop and occur sporadically. In this case, you can use, for example, the pocket modem from Systeme Helmholz on your laptop to remedy the problem.

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 cannot establish a connection to the exchange modem. However, a connection with a telephone on the same line works.

A: It is possible that the number you chose is not enabled for data/fax services in the local telephone exchange. Please check these settings.

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: 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.

9   Appendix

9.1   Technical Data

Device type	700-753-8MD21 (analog)
Degree of protection	IP 20
Dimensions	116 x 40 x 124 mm^3 (LxWxH)
Weight	Approx. 280 g
Operating voltage	+24 V DC $\pm$ 25%, external or 5 V via backplane bus
Current consumption	Approx. 500 mA (backplane bus) approx. 140 mA (external)
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	
- Interface (front)	9-way Sub D socket / RS485, isolated
- Interface (backplane bus)	via backplane bus conn. / RS485, isolated
- Transmission rates	19.2 kbps to 187.5 kbps
USB	
- Interface	USB-B socket / USB 1.1 compliant
- Transmission rate	9.6 kbps to 115.2 kbps through virtual COM port
Modem	
- Interface (internal)	RS232
- Transmission rate	9.6 kbps to 115.2 kbps
- Modem connection	RJ-11 socket
- Modem type	Analog interface 56 kbps (V.92)
- Transmission standards / protocols	V.90, V.34+, V.34, V.32bis, V.32, V.22, V.22bis, V.21, V.23, BELL standard 103, 212 Fax Class 1, Fax Class 2
- Data compression	MNP2-4, V.42 LAPM, MNP 10, 10EC
- Error correction	MNP5 and V.42

9.2   Pin assignments

9.2.1   Assignment of the MPI interface

Connec-tor	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

9.2.2 Analog modem connection

RJ11 pins	Designation	Meaning
1	-	unused
2	LA1	looped-through telephone connection
3	LA	telephone line
4	LB	telephone line
5	LB1	looped-through telephone connection
6	-	unused

9.2.3   Assignment of the USB interface

Connector	Signal	Meaning
1	VCC	+5 V DC
2	D-	Data signal -
3	D+	Data signal +
4	GND	Ground

The TS 300 comes with a shielded USB 2.0 cable with a length of three meters.

The cable has a standard 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.

9.2.4   Power supply socket

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

9.3   Modem data

9.3.1   List of countries for the internal modem

Valid from hardware version 3-3A-3

	country code		country code
Europe TBR21	FD (Default)	Jordania	FE
Albania	B8	Kuwait	62
Algeria	FE	Laos	FE
Andorra	FD	Latvia	FD
Argentinia	07	Lebanon	64
Australia	09	Liechtenstein*	FD
Austria*	0A	Lithuania	FE
Bangladesh	FE	Luxembourg*	69
Belarus	FE	Macedonia	FE
Belgium*	0F	Malaysia	6C
Birma (Myanmar)	FE	Mexico	73
Bolivia	FE	Monaco	FD
Bosnia-Herzegowina	FE	Montenegro	FE
Brasil	16	Morocco	FE
Brunei	FE	Netherlands*	7B
Bulgaria	1B	New Zealand	7E
Cambodscha	FE	Nicaragua	FE
Canada	20	Nigeria	81
Chile	25	Norway*	82
China	26	Oman	FE
Columbia	27	Pakistan	84
Corea (Republic)	61	Panama	85
Costa Rica	FE	Paraguay	87
Croatia	FA	Peru	FE
Cyprus	2D	Philippines	89
Czechia	2E	Poland	8A
Denmark*	31	Portugal*	8B
Domenican Republic	33	Romania	8E
Ecuador	FE	Russia	B8
Egypt	36	San Marino *	FD
El Salvador	FE	Saudi Arabia	98
Estonia	F9	Senegal	99
Finland*	3C	Serbia	FE
France*	3D	Singapore	9C
Germany*	42	Slovakia	FB
Great Britain*	B4	Slovenia	FC
Greece*	46	South Africa	9F
Guatemala	FE	Spain*	A0
Honduras	FE	Sri Lanka	A1
Hong Kong	50	Sweden*	A5
Hungary	51	Switzerland*	A6
Icland*	52	Taiwan	FE
India	53	Thailand	A9
Indonesia	54	Tunisia	FE
Ireland*	57	Turkey	AE
Israel	58	Ukraine	FE
Italy*	59	United Arab Emirates	B3

!

These country codes are not valid until hardware version 3-3A-3!

The HW status is printed on the housing of the TS300 + analog modem.

If unclarities emerge contact our technical support!

continuation	Country code		Country code
ITU/Taiwan	FE	Uruguay	B7
Japan	00	USA	B5
Jemen	FE	Venezuela	BB
		Vietnam	FE

* The standard setting TBR21 (FD) applies to all public telephone networks of these countries. The explicit setting of the specified country code is only required for old telephone systems.

9.3.2   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 analog modem in the TS 300 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 baudrate, 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.

9.3.3   S-register contents for the internal modem

Certain value ranges are defined in the internal modem memory using the "*S-register*". 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.

Overview of the S-registers:

Register	Function	Units	Range	Default
S0*	Number of dialing tones before automatic offhooking	Dial tones	0-5	5
S1	Ring counter	Dial tones	0-255	0
S2*	Escape	ASCII	0-255	43
S3	Return	ASCII	0-127	13
S4	Line feed character	ASCII	0-127	10
S5	Backspace character	ASCII	0-255	8
S6*	Waiting time for dial tone	s	4-7	4
S7*	Waiting time for carrier signal	s	0-100	60
S8*	Dial pause	s	1-7	2
S9*	Response time for carrier signal	0.1 s	1-255	6
S10*	Time between lost carrier signal and hanging up	0.1 s	20-254	20
S11*	Data Transmit Controller DTC (144/336)	1s	0-255	0**
S12*	Transmission cycles of the ESC character	0.02 s	0-255	50
S13*	Number of dial attempts for transmitting the message		1-12	3
S14*	General settings			138
S15*	Data Transmit Controller DTC (56k 4.1)	1s	0-255	0**
S17*	Remote initiation character		0-127	42
S21*	Settings for V24 (RS232)			116
S22*	Settings			75h (117)
S24*	Time before switchover to sleep mode	s	0-255	0
S25	Time for DTR signal	0.01 s	0-255	5
S26	Time between RTS/CTS	0.01 s	0-255	1
S27*	General settings	-		137
S29	Time for "flash" modifier	10 ms	17	17
S30	Time until hanging up on silence	10 s	0-255	0
S31*	General settings	-		C2h (194)
S36*	Switch back to the error logs	-		135
S38	Time before forced hanging up	s	0-255	20
S39*	Flow control	-		3
S40*	General settings	-		104
S41*	General settings	-		195
S46*	Data compression	-		138
S48*	Setting for V24 (RS232) declaration phase	-		7
S86	Error event code	-		read only
S91*	Transmit level	-	0-15	9
S95*	Result code	-		0

* These registers are stored with „*AT&W0*" or „*AT&W1*" in the user pre-settings.

Systeme Helmholz GmbH will be happy to provide a detailed description of the register commands described here on request.

9.4 Further documentation

Internet:

http://www.helmholz.de

http://www.usb.org

http://www.siemens.com

Notes