

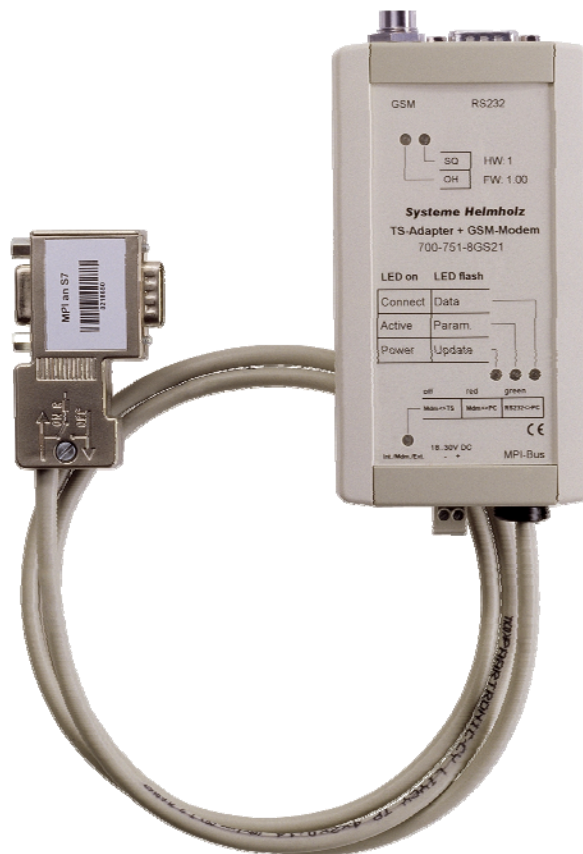
# SSW7-TS with GSM modem

700-751-8GS21

## User Manual

Edition 2 / 14.08.2007

HW 2-S and FW 3.22 and higher



Order number of manual: 900-751-8GS21/en



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Hannberger Weg 2, 91091 Grossenseebach, Germany

**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.helmholtz.de](http://www.helmholtz.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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# 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 with GSM modem 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.*



*Only authorized persons must have access to the modules!*

## **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.



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

## **1.3 Information for the user**

This manual is addressed to anyone wishing to configure, use, or install the SSW7-TS with GSM modem.

The manual tells the user how to operate the SSW7-TS with GSM modem and explains the signaling functions. It provides the installing technician with all the necessary data.

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

The SSW7-TS with GSM modem 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 with GSM modem 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 SSW7-TS with GSM modem alone. Make sure in the software that uncontrolled restarts cannot occur.



*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 30 module, you must install it in a cabinet.

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

### 2.1 Vertical and horizontal mounting

The module can be mounted in any orientation.

### 2.2 Minimum clearance

Minimum clearances must be observed because

- then it is possible to insert and remove the SSW7-TS with GSM modem 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.



*Non-observance of the minimum distances can destroy the module at high ambient temperatures!*

For the SSW7-TS with GSM modem, a minimum clearance from other modules of 60 mm must be left above and below, and 10 mm at the sides.

### **2.3 Mounting of the module**

A wall or DIN rail bracket is enclosed for mounting the SSW7-TS with GSM modem on flat surfaces or on DIN rails.

## 3 System Overview

### 3.1 Requirements for a GSM connection via CSD

The SSW7-TS with GSM modem can be operated on all GSM-compliant networks with the frequencies 850 MHz, 900 MHz, 1800 MHz, and 1900 MHz. By selecting the provider whose SIM card is inserted in the SSW7-TS with GSM modem, the SSW7-TS with GSM modem should, after correct parameterization, automatically sign on to the available GSM network.

Please remember that existing SIM cards or SIM cards purchased without complying with the following rules do not support incoming data services. That is, it is not possible to dial up the SSW7-TS with GSM modem, e.g. using TeleService software from Siemens.

When purchasing a suitable SIM card, make sure the provider supports and specially activates the circuit-switched data (CSD) protocol.

The CSD service can also be activated subsequently, that is, after you have purchased a SIM card.

A separate phone number is always assigned to the SIM card for the CSD service. At least two numbers are therefore activated for the SIM card: the phone number and the data number for incoming connections.

There may also be a third number, if the fax service is activated in addition to voice and data.

Experience has shown that the following contracts in their pure form can be chosen. However, mixed contracts are common, for example, where not on the voice but also the data service is released for incoming connections.

Function	Prepaid card	Contract for voice transmission	Contract for data transmission
Outgoing data connection	✓	✓	✓
Incoming data connection	-	-	✓
SMS	✓	✓	✓
Voice connection	✓	✓	-

CSD supports a maximum data transmission rate of 9.6 kbps.

Some providers also offer a high-speed circuit data (HSCSD) data transmission rate (14.4 kbps without error correction). Dial-up via the HSCSD service is not supported by SSW7-TS with GSM modem.

Non-GSM services, such as GPRS, EDGE, or UMTS are services that can actively establish connections, that is, from inside to outside (say, from a cell phone or laptop to the Internet). These services



*For teleservice applications, the SIM card must be activated by the provider for incoming data traffic!*



*A remote connection to the SSW7-TS with GSM modem is not possible via GPRS.*

do not allow dial-up from outside and can therefore not be used for normal teleservice solutions.

### 3.2 Application and function description

The SSW7-TS with GSM modem is a gateway between the RS232 or modem and an MPI bus.

The RS232 interface can also be directly connected to the modem to implement communication away from the MPI bus.

The integrated quadband GSM module of the SSW7-TS with GSM modem is suitable for industrial applications and supports the common GSM transmission standard CSD (Circuit Switched Data).

Non-GSM standard, such as GPRS, EDGE, and UMTS are not supported because this service only permits outgoing, not incoming connections.

The CSD protocol offers a transparent transmission service with 9.6 kbps. According to our current knowledge, it is offered by all GSM network operators.

If the equipment is destined for use abroad, please ask the telephone companies in the country of use whether and under what conditions the CSD protocol is supported.

With a RS232 or modem link, up to eight MPI links (19.2 kbps or 187.5 kbps) can be used simultaneously.

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

The SSW7-TS with GSM modem can draw the necessary power supply from the MPI bus interface or from an external power source (see chapter 3.7.4).

The MPI link of the SSW7-TS with GSM modem to a programmable controller is effected via the nine-way Sub D connector.

With the enclosed null modem cable the SSW7-TS with GSM modem can be connected on a serial Com port for parameterization or for in situ use as a PC adapter (MPI).

With the appropriate software, it is possible to use the SSW7-TS with GSM modem as

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

Please consult the programming software manuals for further information.

A firmware update for the SSW7-TS with GSM modem can be transferred to the SSW7-TS with GSM modem adapter both locally and via a remote link.



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



*For teleservice operation, a GSM antenna and a SIM card activated for incoming data connections are required.*

For teleservice, an enabled SIM card for incoming data connections (CSD) and a GSM antenna are required (see chapter 3.7.3).

### 3.3 Connections

The SSW7-TS with GSM modem has the following connection options:

- Power supply socket for input of 24 V DC.  
This power supply option can be used if the used programmable controller does not provide sufficient power supply on the bus connector
- RS232 socket for connecting the supplied null modem cable for direct operation as a programming adapter or for using the internal modem, e.g. for SCADA or visualization systems.
- SIM card slot with removable loading slide for the 3 V DC SIM cards.
- Antenna socket of type FME (male) for connecting commercial type GSM antennas (see chapter 3.7.3).
- 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 connected (ON) if the SSW7-TS with GSM modem is at the beginning or end of a bus segment. If this is not the case, the switch position must be OFF.



*The SIM card must only ever be inserted and changed while the device is switched off.*

### 3.4 LED displays

The SSW7-TS with GSM modem has six LEDs, including two two-color LED, to indicate its operating status.

#### 3.4.1 Status LEDs for standard functions

The three LEDs "Power", "Active", and "Connect" provide information about whether and how the SSW7-TS with GSM modem 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

Store firmware update and system start	BLINK	OFF	OFF
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### 3.4.2 Status LEDs for modem functionality

The two LEDs “DCD” and “SQ”, indicate the status of the integrated modem.

LED status for operating status	DCD LED (orange)	SQ LED (orange)	SQ LED (green)
Modem signed on to the GSM radio network and is ready to receive	OFF	BLINK	
Display of the signal quality of the available GSM network. (Continuous light means very good, slow flashing means bad)	OFF	BLINK	ON BLINK 0.5 Hz BLINK 1 Hz OFF
Connection established. Modem ready for transmission of useful data	ON	BLINK	OFF

### 3.4.3 Status LED for operating mode display

The LED “TS/MDM/PC” indicate which of the three possible operating modes the SSW7-TS with GSM modem is currently in.

LED status for operating status	PC LED (green)	MDM LED (red)
The internal TS adapter is connected to the internal modem (micro-switch setting “TS”). The RS232 interface is inactive	OFF	OFF
The internal TS adapter is connected to the RS232 interface (micro-switch setting “PC”). The internal modem is inactive.	ON	OFF
The internal modem is connected to the RS232 interface (micro-switch setting “MDM”). The internal TS adapter is inactive.	OFF	ON

## 3.5 Function switch

### 3.5.1 Microswitch TS adapter

The "TS/MDM/PC" switch switches between the three possible operating modes. This switch is located at the bottom side of the housing next to the ext. power supply plug.

- In switch position “TS”, the SSW7-TS with GSM modem functions directly with the modem.  
That way, the SSW7-TS with GSM modem can be used for teleservice using the TeleService software (see chapter 5.2).



**PLEASE NOTICE!!**

*At many older adapter the labelling of the microswitch is „Int/Mdm/Ext“*

*The functions are the same as with the new marking.*

The RS232 interface does not have a function in this switch position.

- In switch position “PC”, the SSW7-TS with GSM modem functions directly with the RS232 interface.  
The SSW7-TS with GSM modem can be operated on the local computer as the TS adapter (MPI) or as a PC adapter (MPI) (see chapter 5.11).  
The modem is inactive in this switch position.
- In switch position “MDM”, the internal modem functions directly with the RS232 interface.  
In this way, the modem can be directly addressed via the RS232 interface, for example, to parameterize it or to use it for teleservice purposes unconnected with MPI (see chapter 5.3).  
The SSW7-TS with GSM modem cannot perform MPI functions in this switch position.

### 3.6 Items supplied

The scope of supply of the SSW7-TS with GSM modem includes:

- SSW7-TS with GSM modem ready to operate
- DIN mounting rail bracket
- 3-meter null modem cable
- SIM card slide
- 24V plug-in element, 2-way, max. 1.5 mm<sup>2</sup> flexible with front connection
- Manual (German/English)
- CD with driver, parameterization tools, additional information

### 3.7 Accessories

#### 3.7.1 Manuals

Manual, German	900-751-8GS21/en
Manual, English	900-751-8GS21/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 GSM antennas and antenna accessories

Stationary triband antenna	700-751-ANT01
Quadband magnetic mount antenna	700-751-ANT02
Patch triband antenna	700-751-ANT03
Portable quadband antenna	700-751-ANT04
GSM antenna extension cable, 5 m	700-751-ANK01
GSM antenna extension cable, 10 m	700-751-ANK02
GSM antenna extension cable, 15 m	700-751-ANK03



*When extending the MPI bus, please follow the relevant configuring guidelines as defined in the documentation of your PLC.*

### 3.7.4 Miscellaneous

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 bus extension cable, 5m	700-751-6VK11
MPI bus extension cable, 10m	700-751-6VK21
MPI bus extension cable, special lengths	700-751-6SO11



## 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

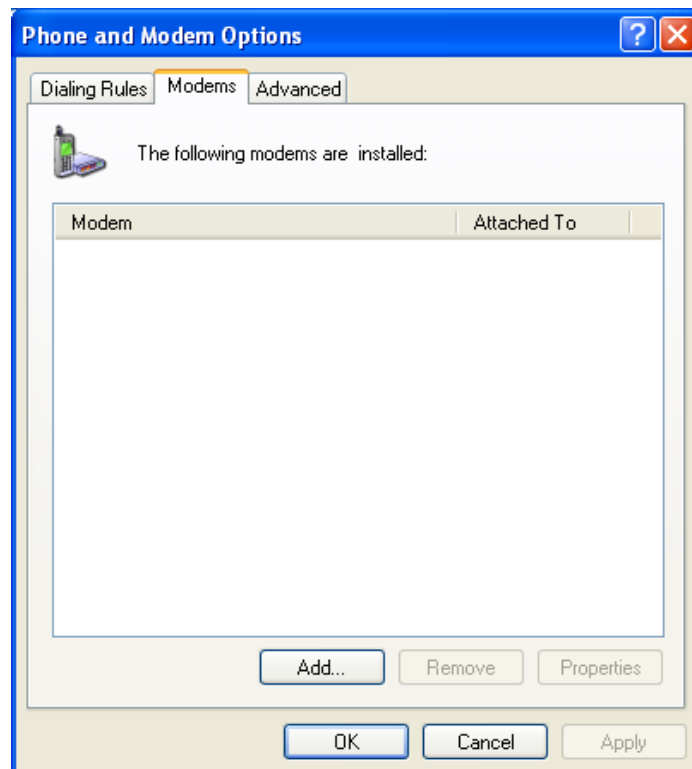
To operate the driver and service tools of the SSW7-TS with GSM modem, a PC or laptop is required with a 32-bit Windows operating system and a CDROM drive. The Windows 2000 and Windows XP operating systems can be used.

In the programming devices or PCs used, there must be one RS232 interface. You can also use normal commercial RS232 interface cards.

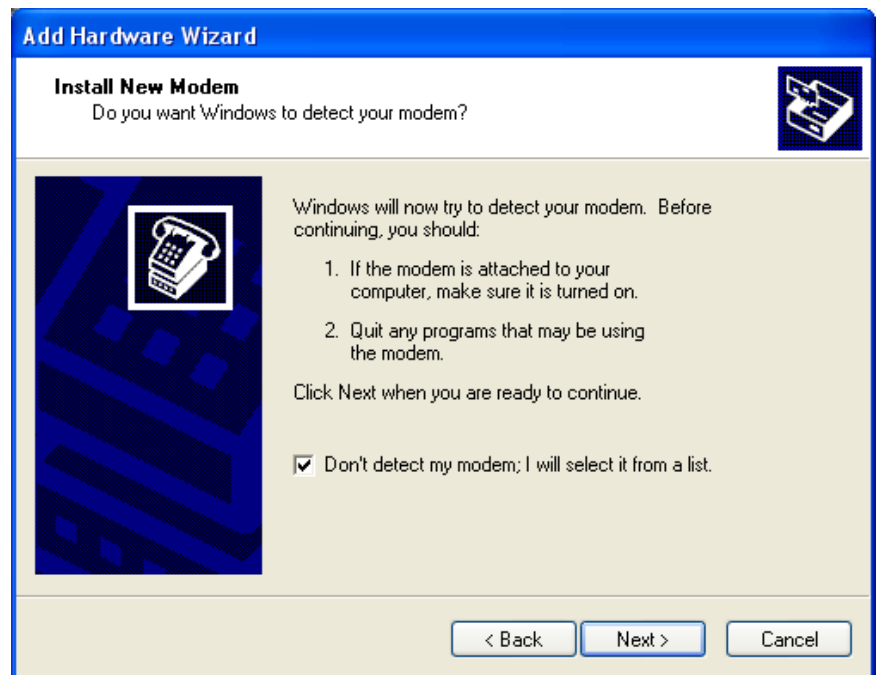
### 4.2 Installation of the modem driver

If the modem of the SSW7-TS with GSM modem is to be operated directly on a programming device or PC via RS232, the corresponding modem driver must be installed. For this purpose, the micro-switch must be put in the central position "MDM" and the RS232 cable plugged into the SSW7-TS with GSM modem.

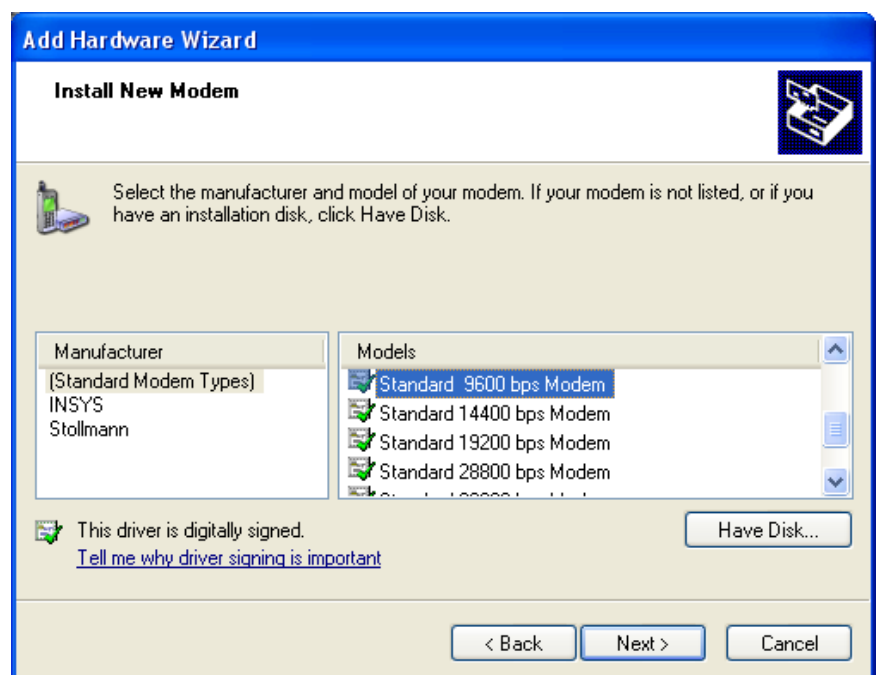
- The internal GSM module does not support plug & play functionality. The "Phone and Modem Options" in the Control Panel are used to install the modem manually.



- The hardware wizard is called with the “Add...” button.

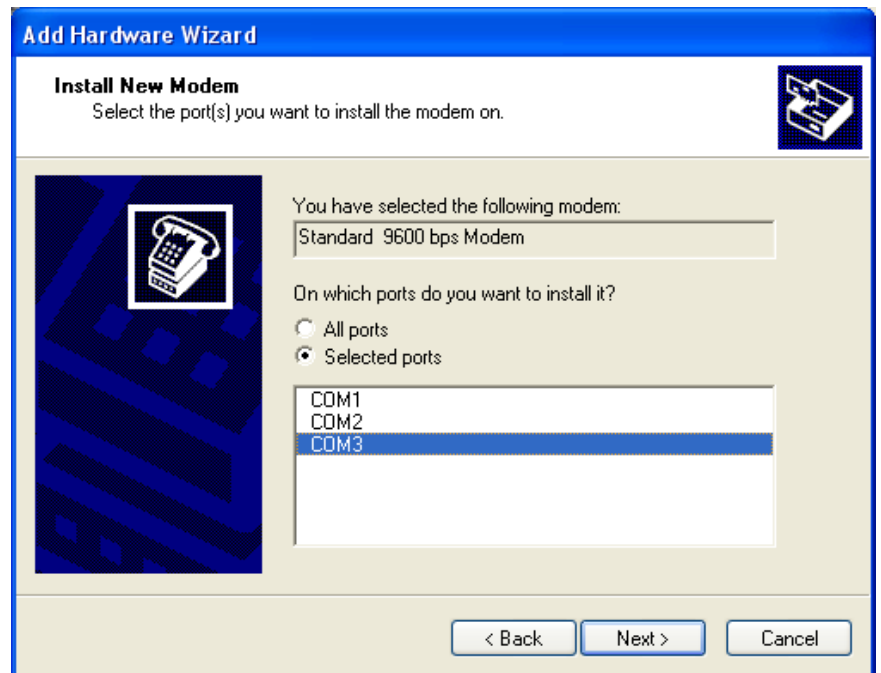


- Setting the “Don’t detect my modem” checkmark causes the system’s own standard modem drivers to be listed. These can be selected once you have pressed the “Next” button.

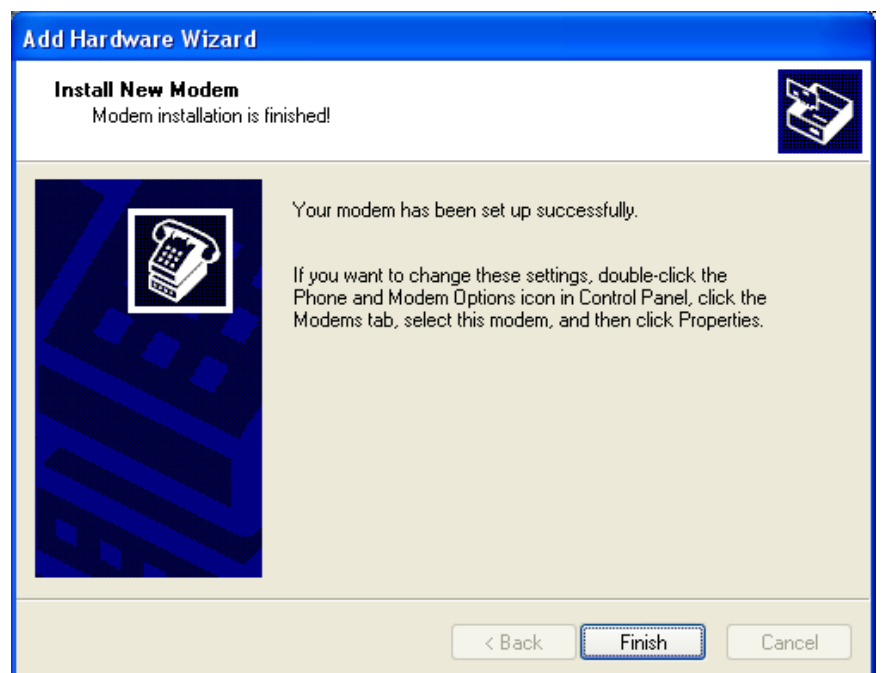


- Under Models, select “Standard 9600 bps Modem”.

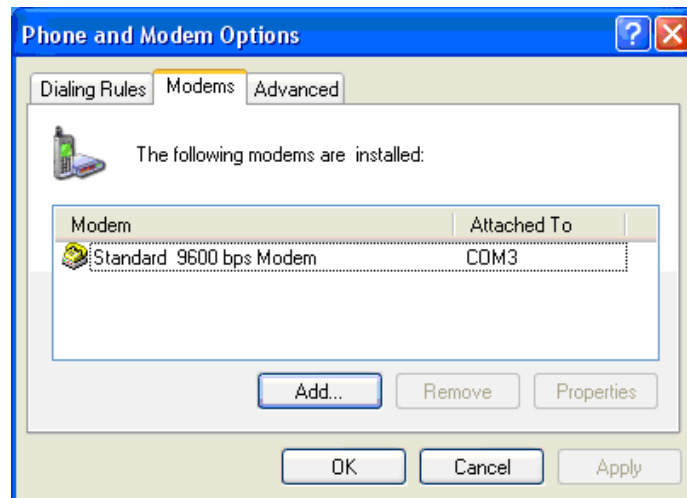
- The next step is to assign the COM port. Select the COM port where the SSW-TS with GSM modem is connected.



- 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 phone and modem options.



The SSW7-TS with GSM modem can now be used as the local modem for a telecommunication link. Parameterization functions to the modem can also be used.

### 4.3 Service tools

#### 4.3.1 Parameterizing and updating with SHTools

With the SHTools software, it is possible to perform a system update of the SSW7-TS with GSM modem, if required. The SSW7-TS with GSM modem 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 with GSM modem.

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 Helmholtz"*.

The most important program functions are described below.

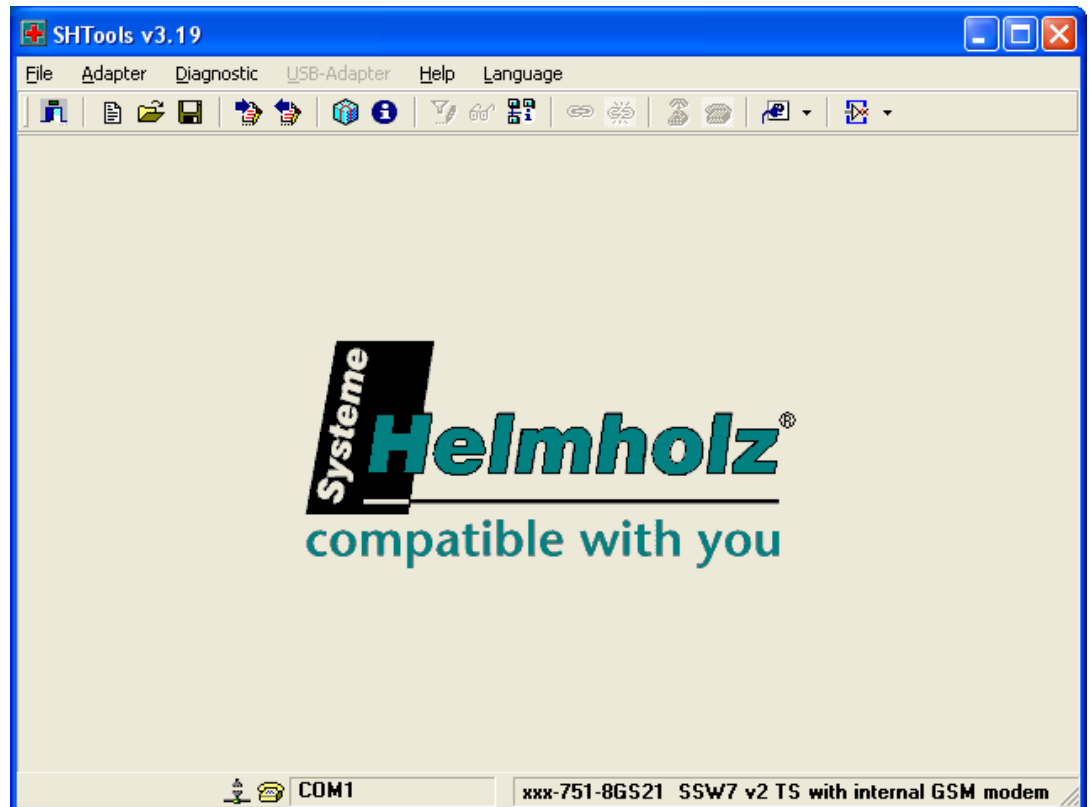
#### 4.3.2 Firmware update

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

For the local update, a link must be established between the SSW7-TS with GSM modem and a RS232 interface on the PC on which SHTools is installed. The micro-switch on the SSW7-TS with GSM modem 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 with GSM modem, an analog modem is also required on the local computer, which is addressed via a COM port.

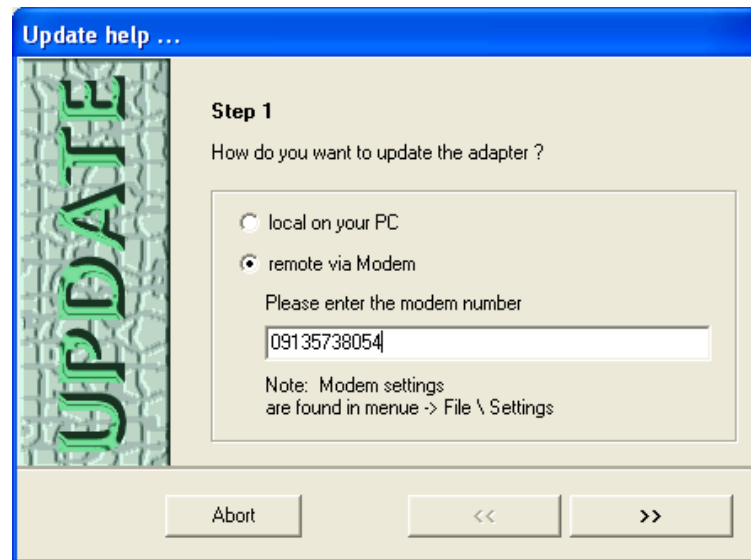
The SHTools contain update functions for many adapters of Systeme Helmholtz GmbH. How to perform an update is explained below.



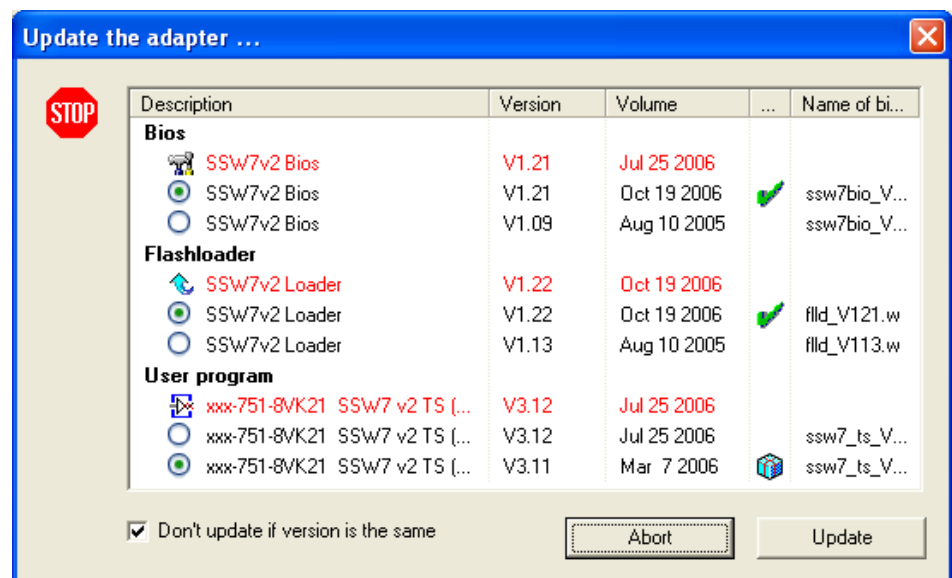
- Via menu item *“Adapter / ... select”*, the required device is selected by its order number (in this case, the SSW7 v2 TS with internal GSM modem).
- Via menu item *“Adapter / Select COM port/serial number”*, the required interface is selected.

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).



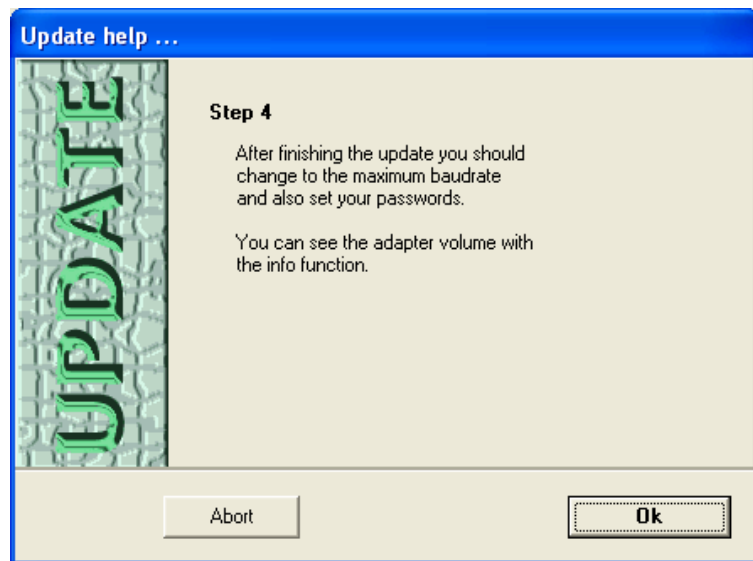
- After step 1 is confirmed, an attempt to establish a link to the SSW7-TS with GSM modem follows. If this is successful, updating of the firmware sections, of which later versions are available, begins automatically.
- If, under “*File / Settings*” the “*Automatic update*” option is deselected, the 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”*.



#### 4.3.3 Parameterization with SHTools

SHTools is an alternative to the TeleService software for parameterizing the SSW7-TS with GSM modem.

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

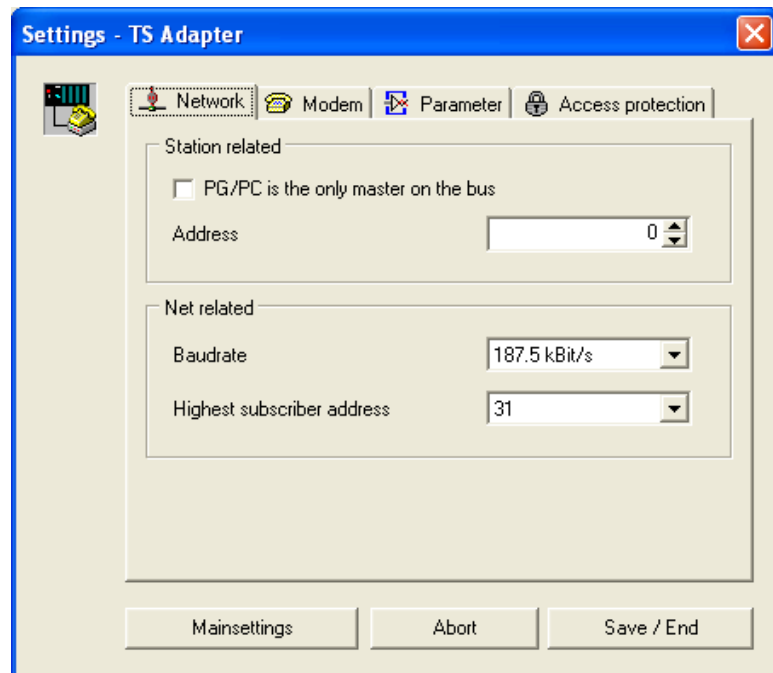
For parameterization, a link must be established between the SSW7-TS with GSM modem and a RS232 interface on the PC on which SHTools is installed. The micro-switch on the SSW7-TS with GSM modem must be put into the “PC” position. The “PC” operating mode is indicated by a lit green “TS/MDM/PC” LED.

With the “Adapter / Read parameters” menu item, it is possible to read the current parameterization out of the SSW7-TS with GSM modem.

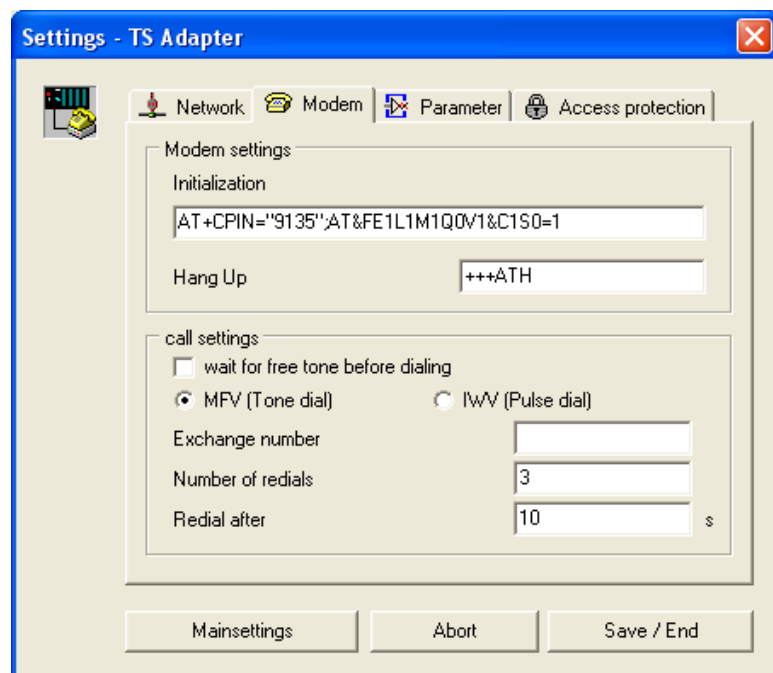
The read parameters are displayed in the „Settings – TS adapter“ window.

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

- Setting the MPI-specific parameters



- Setting the modem-specific parameters

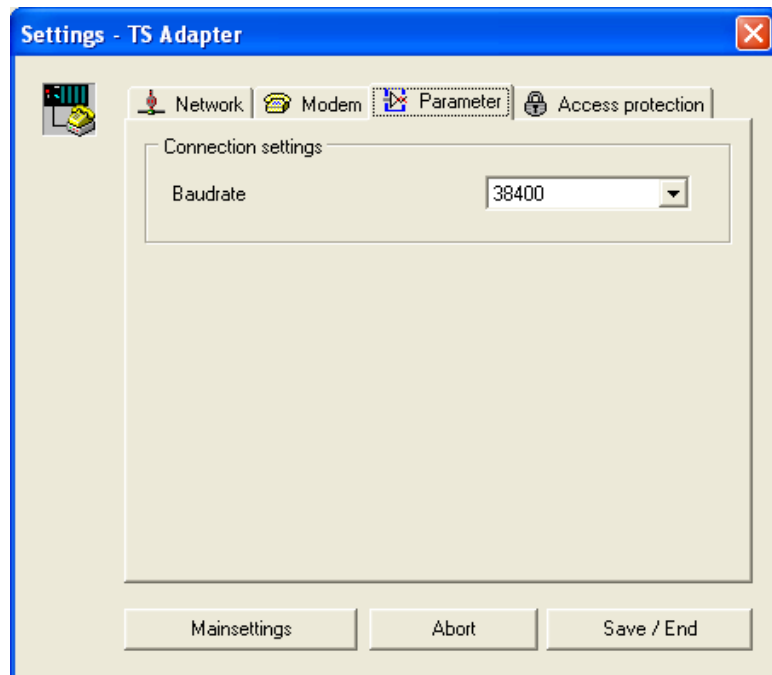


In the figure above, the standard initialization string now

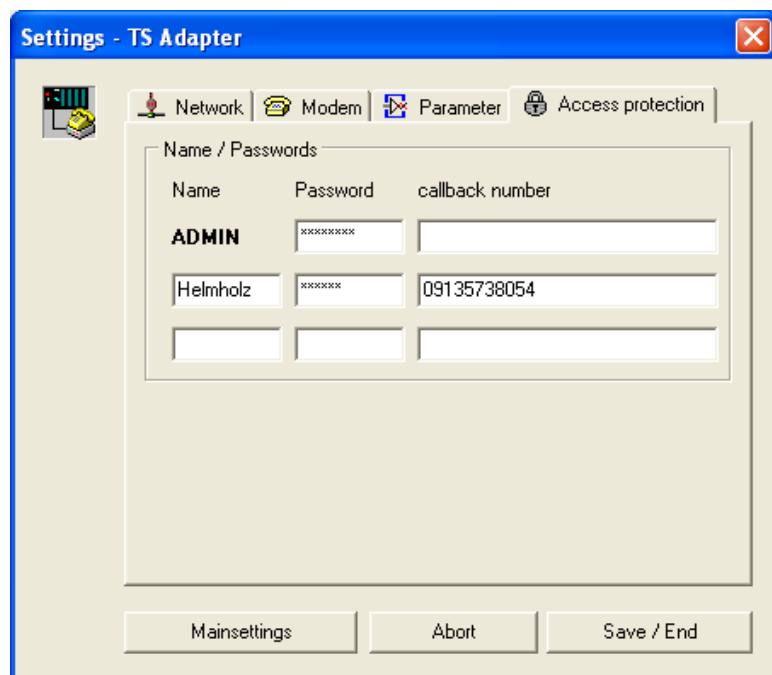


includes the function that presets the PIN of the SIM card (see chapter 6.2.3.2).

- Setting the transmission rate between the modem and SSW7-TS with GSM modem



- Setting the access protection for remote access



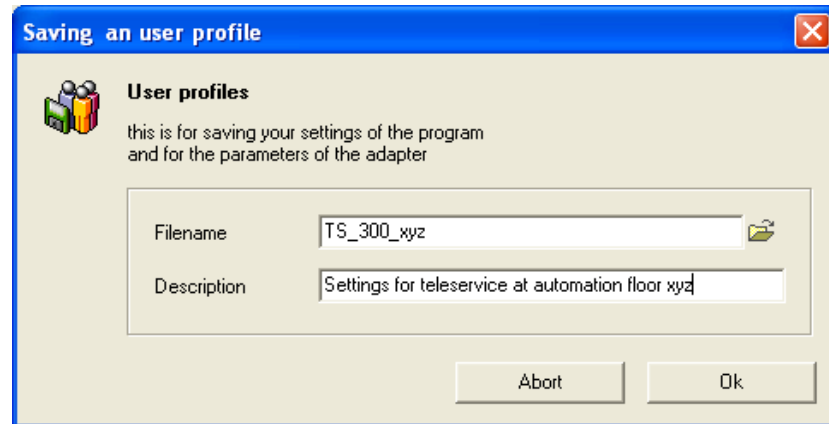
With the “Save / End” button, the edited contents of the four tabs are transferred to the SSW7-TS with GSM modem.

Pressing the “Abort” button closes the setting window without making the changes.

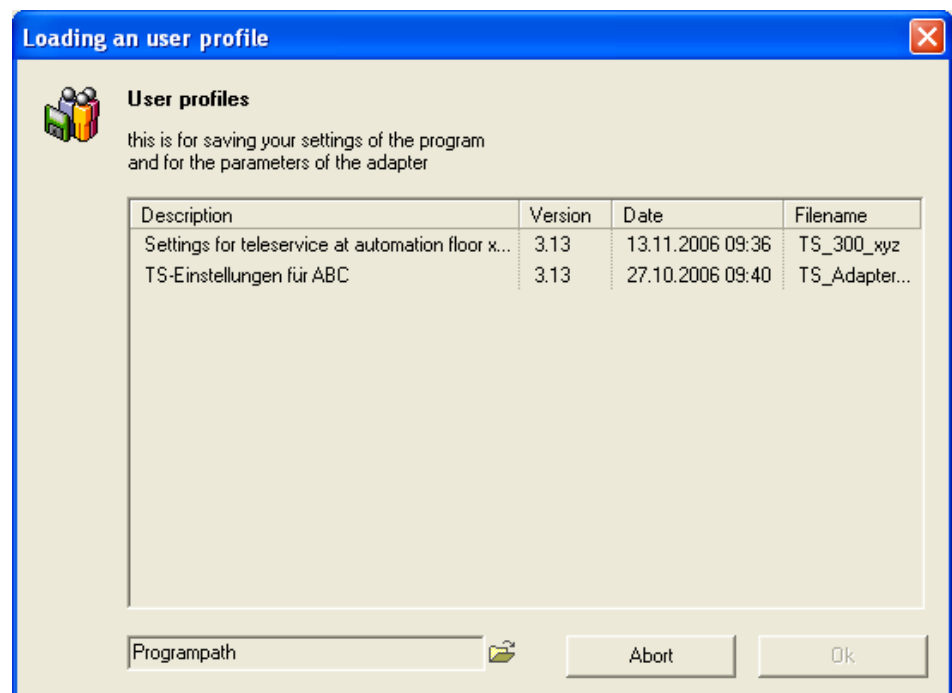
You can display the basic settings (as-delivered state) by pressing the “Mainsettings” button.

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.

To handle the special aspects of GSM technology, further functions have been included in SHTools that facilitate handling the SSW7-TS with GSM modem.

#### 4.3.4 PIN transfer during direct modem operation

In micro-switch setting *“MDM”*, direct access to the modem of the SSW7-TS with GSM modem is possible. However, in many cases a PIN is necessary to be able to use and query functions of the GSM network and the SIM card used.



To parameterize the GSM modem, it is usually necessary to enter a PIN first.

In SHTools, an input box appears under “Activate adapter/GSM modem with PIN” in which the PIN can be transferred.

**Please enter the PIN for the modem**

**Security**

Here you can log on the GSM-Modem with your PIN to the network.  
Attention :  
After a Voltage drop the modem has to be logged on with the PIN to the network again!

Enter the four digit PIN now

max. PIN 3    max. PUK 10    Data mode ????

Status **Please enter the PIN from your SIM card**

When the modem has successfully transferred the PIN and signed onto the radio network the current signal strength is displayed as a bar.

**Please enter the PIN for the modem**

**Security**

Here you can log on the GSM-Modem with your PIN to the network.  
Attention :  
After a Voltage drop the modem has to be logged on with the PIN to the network again!

Enter the four digit PIN now

max. PIN ??    max. PUK ??    Data mode ????

Status

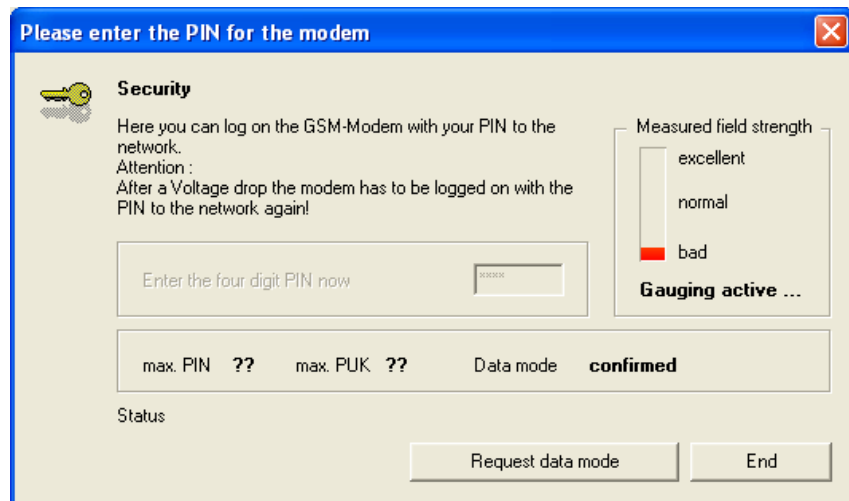
Measured field strength

excellent  
normal  
bad

Gauging active ...

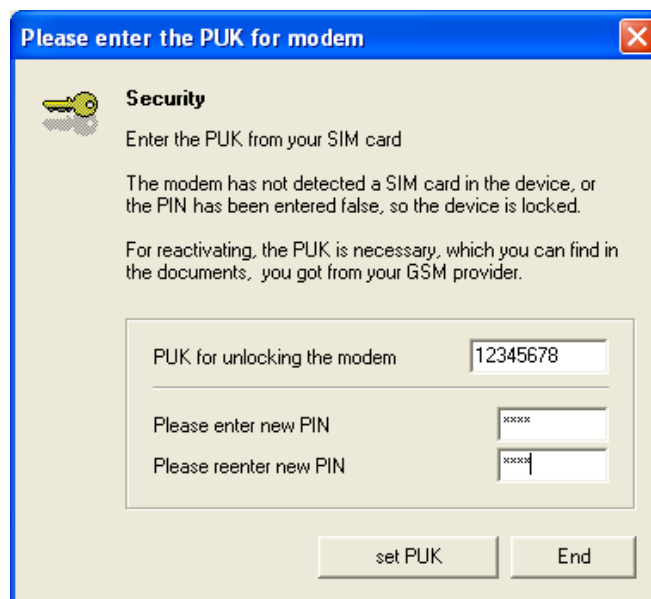
The “Request Data Mode” button is used to check whether your SIM card is activated for incoming data transfer (CSD). If this is not the case, the SSW7-TS with GSM modem cannot be used for teleservice in a system.

To query the data mode, it is necessary to select the SSW7-TS with GSM modem through an analog or ISDN modem during the query by clicking the “Request Data Mode” button.



#### 4.3.5 Activating the PIN with a personal unblocking key (PUK)

If the SIM card is blocked or the PIN was repeatedly entered incorrectly, SHTools automatically prompts for entry of the PUK (personal unblocking key) and a new PIN to unblock the modem again.



## 5 Operation on a programmable controller

There are different ways of connecting the SSW7-TS with GSM modem 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 with GSM modem offers the option of communicating with the modem via the RS232 interface. The MPI functionality of the SSW7-TS with GSM modem is deactivated in this case.

### 5.1 RS232 direct operation on a programming device/PC

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

The SSW7-TS with GSM modem can also be operated locally as a PC adapter. The TeleService software does not need to be installed on every PC with local access to the SSW7-TS with GSM modem.

### 5.2 Modem operation on a GSM network

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

In addition to inserting a SIM card activated for incoming data traffic (CSD) and entering the PIN in the initialization string (see chapter 6.2.3.2), please pay attention to the position of the micro-switch for the operating modes. The switch must be put in the "TS" position, which is indicated by the "TS/MDM/PC" LED is 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 with GSM modem is now signed onto the MPI bus and has parameterized the internal modem. You then soon see the orange "SQ" LED blinking. The modem is then logged onto a GSM network.

The quality of the received GSM signals is displayed by a green "SQ" LED. The faster the LED flashes the better the connection. If the LED is continuously lit, a very good GSM network is available.

On the local computer that is to communicate with the SSW7-TS with GSM modem via a telephone link, a functioning modem link to the outside world and, for example, the TeleService software from Siemens are required.

### 5.3 RS232-to-modem operation

To use the modem of the SSW7-TS with GSM modem as a simple GSM modem that does not provide TS adapter functionality, the



*To parameterize the GSM modem, it is usually necessary to enter a PIN first.*

micro-switch 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 RS232, for example, to parameterize it.

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

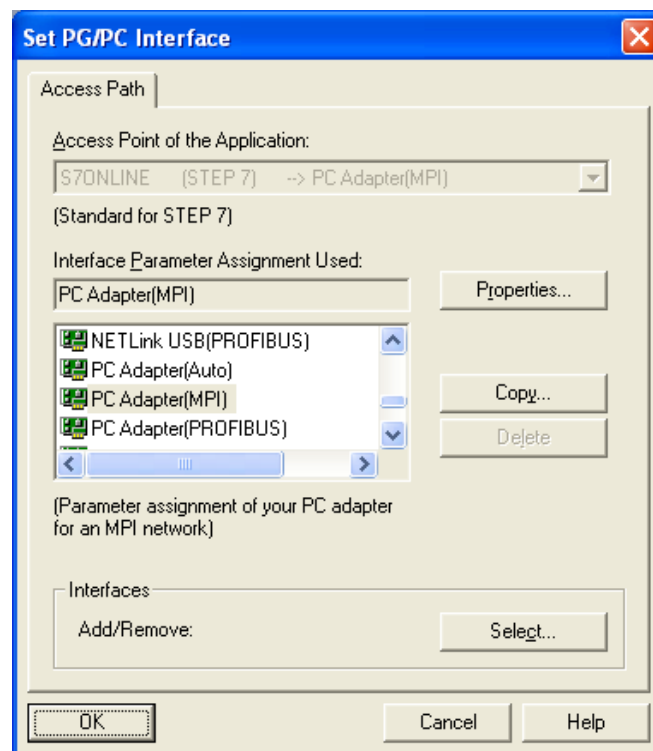
## 6 Configuration of the Simatic tools

### 6.1 SSW7-TS with GSM modem in direct operation

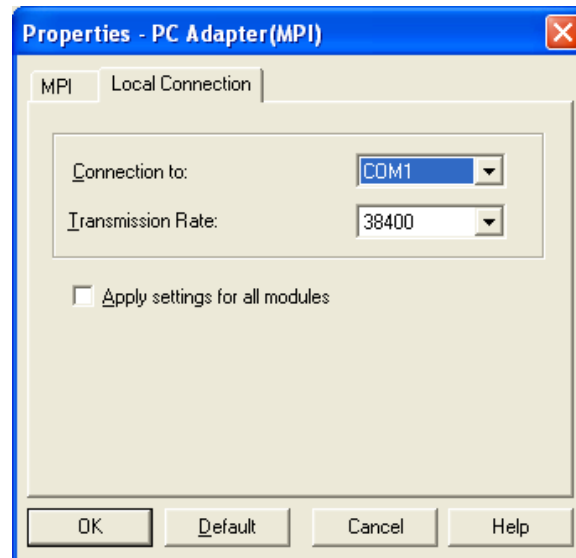
The SSW7-TS with GSM modem is connected with the programming device or PC for direct operation via the RS232 cable supplied.

If the micro-switch is in the "PC" position, which is indicated by a green "TS/MDM/PC" LED, the SSW7-TS with GSM modem 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.



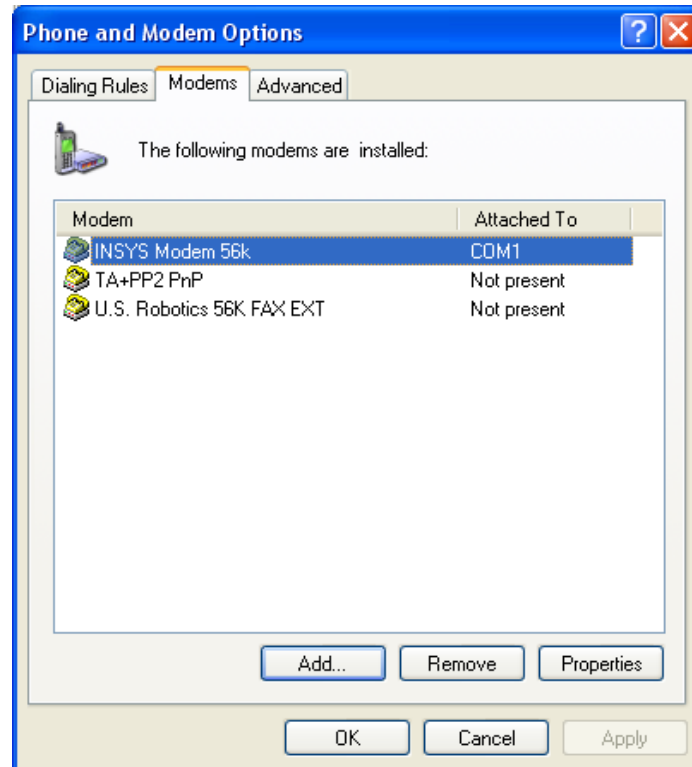
## 6.2 SSW7-TS with GSM modem for teleservice (modem operation)

To select a SSW7-TS with GSM modem, an analog, GSM or 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 “*phone 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 Helmholtz GmbH. The relevant telephone numbers can be obtained from the technical support of Systeme Helmholtz GmbH.

In the case of a modem connection between different technologies, for example, between analog and GSM or ISDN and GSM, further aspects must be taken into account:

- a) Connections between analog and GSM modems
  - The transmission rate of the Windows modem driver must be set to 9.6 kbps.
  - The transmission protocol may have to be set to V.32 (default in Windows driver and in the SSW7-TS with GSM modem GSM)
- b) Connections between ISDN and GSM modems
  - The transmission rate of the Windows modem driver must be set to 9.6 kbps.
  - The call-back function must be assigned an MSN (multiple subscriber number) for the data port on the local ISDN modem.

- Call-back of the SSW7-TS with GSM modem to an ISDN modem is only possible if the B channel protocol in the GSM modem is set to V.110. This setting can be made in the initialization string (see chapter 6.2.3.2).

The information on the settings must be taken from the relevant modem manuals.

### 6.2.1 Settings on the SSW7-TS with GSM modem



*Before initial start-up, the SIM-specific PIN must be added to the initialization string.*

On the SSW7-TS with GSM modem, the micro-switch position “TS” is set, which is indicated by the “TS/MDM/PC” LED is 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 with GSM modem 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 with GSM modem for this.

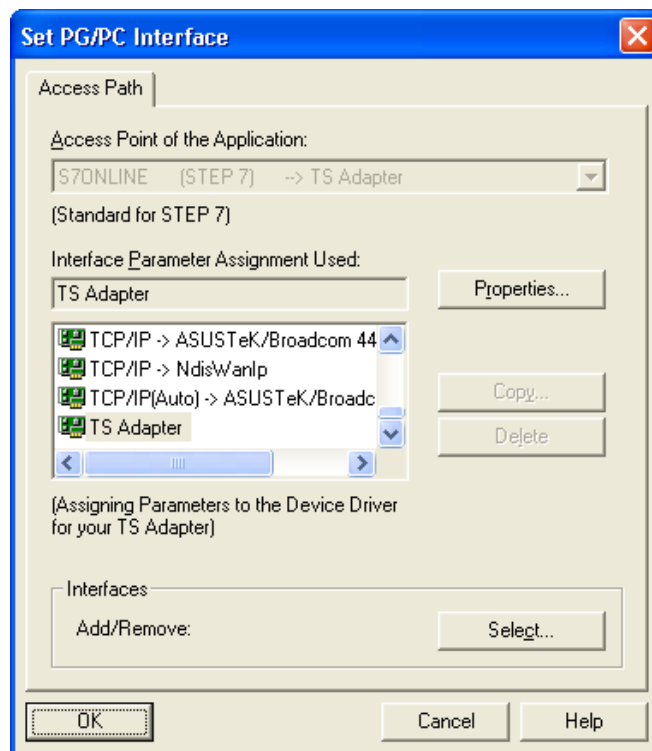
If no further user-specific settings have to be made, the SSW7-TS with GSM modem is then ready for teleservice.



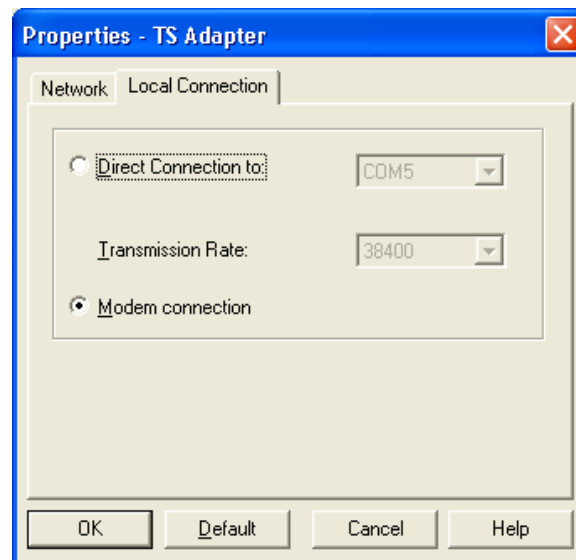
*When the "Power" and "Active" LEDs are on, the SSW7-TS with GSM modem is ready to accept a call.*

### 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 with GSM modem through TeleService.

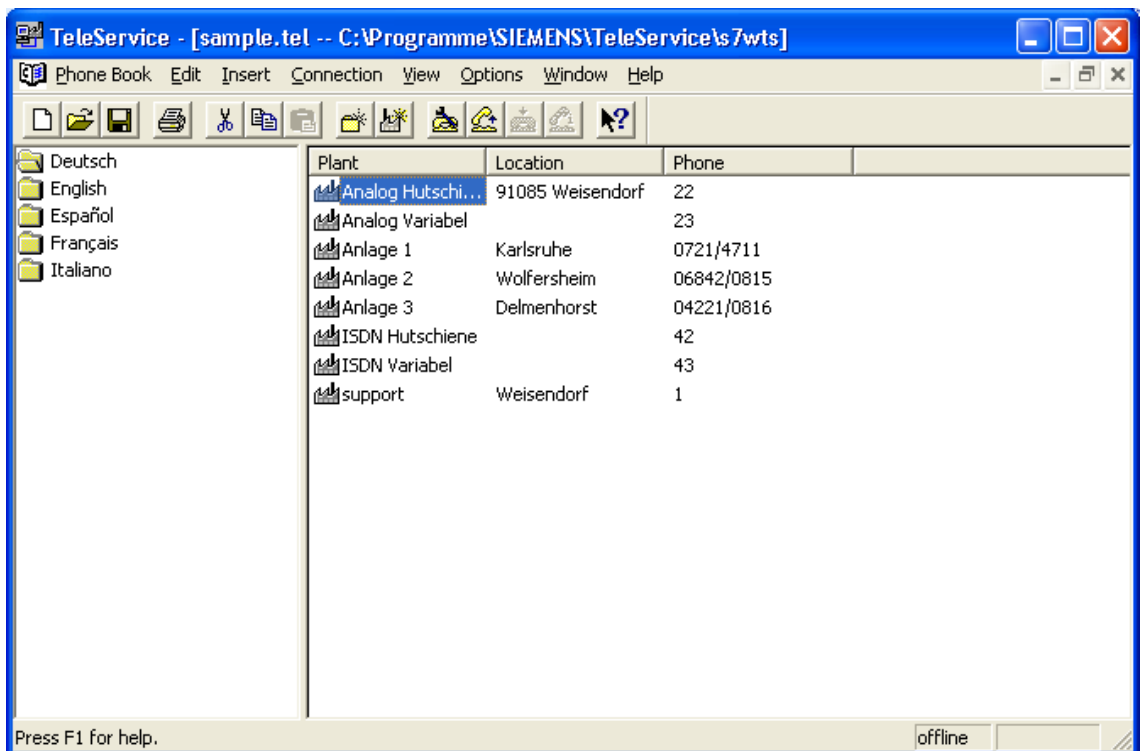


For teleservice, the “*Modem connection*” mode must be selected on the “*Local connection*” tab card in the properties of the TS adapter.

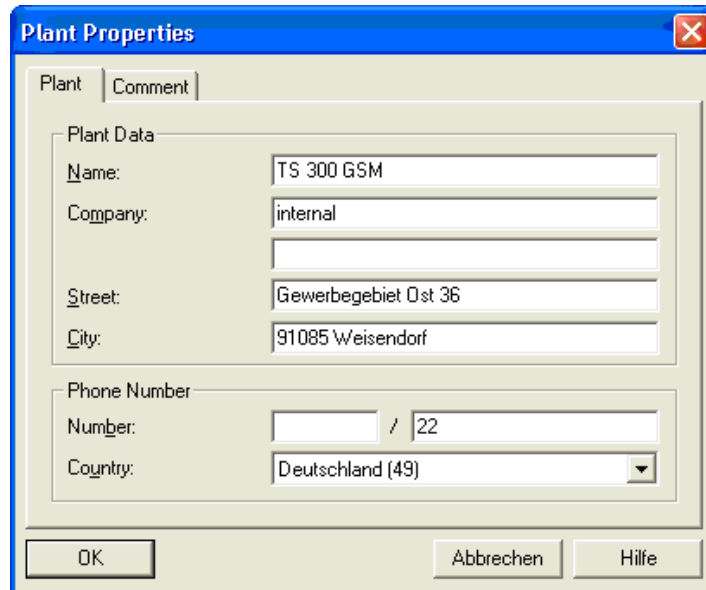


### 6.2.3 Settings through TeleService

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.



The 'Plant Properties' dialog box has two tabs: 'Plant' and 'Comment'. The 'Plant' tab is active. It contains two sections: 'Plant Data' and 'Phone Number'. The 'Plant Data' section has fields for Name (TS 300 GSM), Company (internal), Street (Gewerbegebiet Ost 36), and City (91085 Weisendorf). The 'Phone Number' section has fields for Number (with a separator for 22) and Country (Deutschland (49)). At the bottom are buttons for OK, Abbrechen, and Hilfe.

System or network-specific settings of the SSW7-TS with GSM modem can be made with the TeleService software or SHTools (see chapter 4.3.3 ).

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

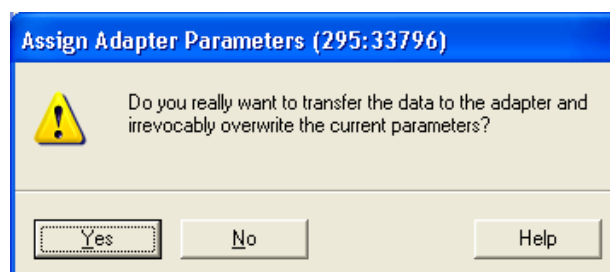
Via the SHTools, parameterization can only be performed locally.

Direct (local) parameterization using the 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 with GSM modem 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 with GSM modem can be made via the "Options / Parameterize adapter" menu item.

After parameterization in the "Parameterize adapter" window, the data are transferred to the SSW7-TS with GSM modem with the "OK" button. But first, you must confirm that you want to overwrite the existing parameterization.



The 'Assign Adapter Parameters (295:33796)' dialog box features a yellow warning triangle icon. It contains the text: 'Do you really want to transfer the data to the adapter and irrevocably overwrite the current parameters?'. At the bottom are buttons for Yes, No, and Help.

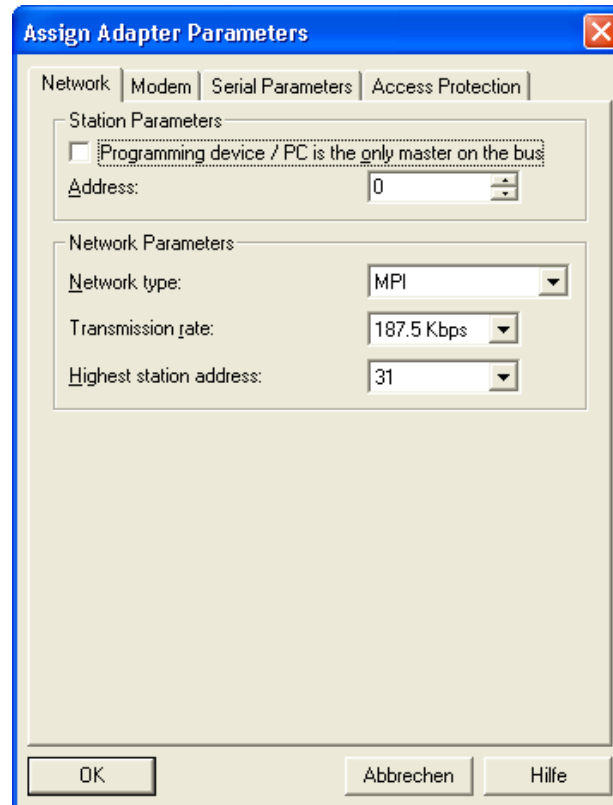
### 6.2.3.1 Bus parameters

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



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

Please note that the SSW7-TS with GSM modem is only suitable for the network type “MPI” and transmission rates “19.2 kbps” and “187.5 kbps”.



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

The settings for

- Network type
- Transmission rate
- Highest station address

must match the hardware configuration of the connected CPU. Moreover, the SSW7-TS with GSM modem 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 semicolon separates the first and second AT command sequence and must not be omitted!



For call-back from GSM to an ISDN modem, further parameters must be set.

The internal modem of the SSW7-TS with GSM 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



Transfer of a PIN is necessary for teleservice operation.

To use the GSM functions of a particular SIM card, it is necessary to pass on the relevant PIN (personal identification number) to the SIM card in the initialization string before regular operation.

The command sequence for passing on the PIN is added to the initialization string and separated off by a separator.

The command sequence for passing on the PIN has the following meaning:

AT	Initiate modem commands
----	-------------------------

+CPIN= Command identifier for PIN transfer  
"9135" The actual PIN that is placed in quotation marks  
; Separator between two AT command sequences

The PIN is generally four digits long, for example "9135" or "1111".

As the figure above shows, the initialization string of GSM 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 is activated by transfer of the PIN. The second part is sent to the modem again each time the connection is terminated.

If you change the SIM card, you must make sure that the PIN the initialization string of the SSW7-TS with GSM modem is changed or deleted first. Otherwise the SIM card will be disabled after three failed sign-on attempts with an incorrect PIN.

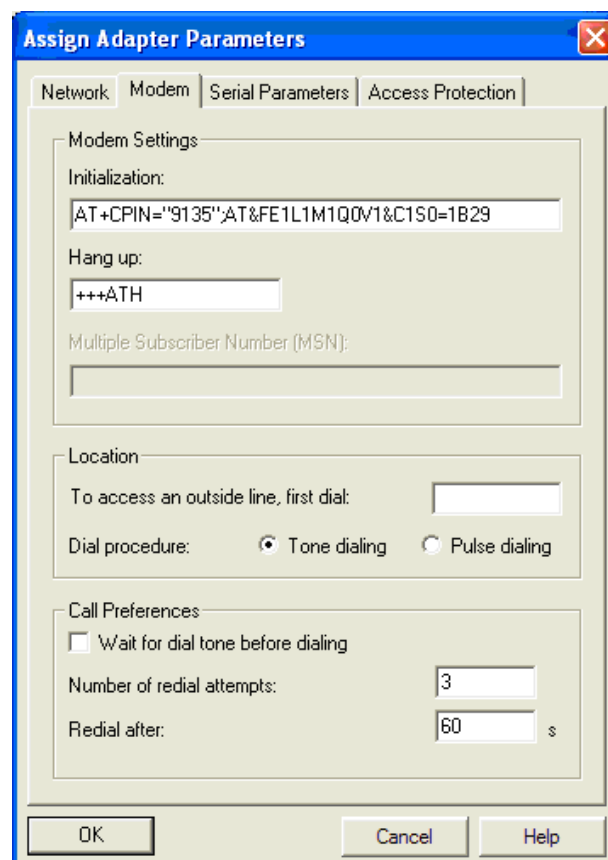
Call-back from GSM to an ISDN modem is only possible if the B channel protocol in the GSM modem is set to V.110. This setting can also be made using an AT command. The command sequence is:

AT Initiate modem commands  
B Setting the protocol in the B channel  
29 V.110 asynchronous with 9600 bps

When combined with the standard initialization string, the AT can be omitted (see the following picture).

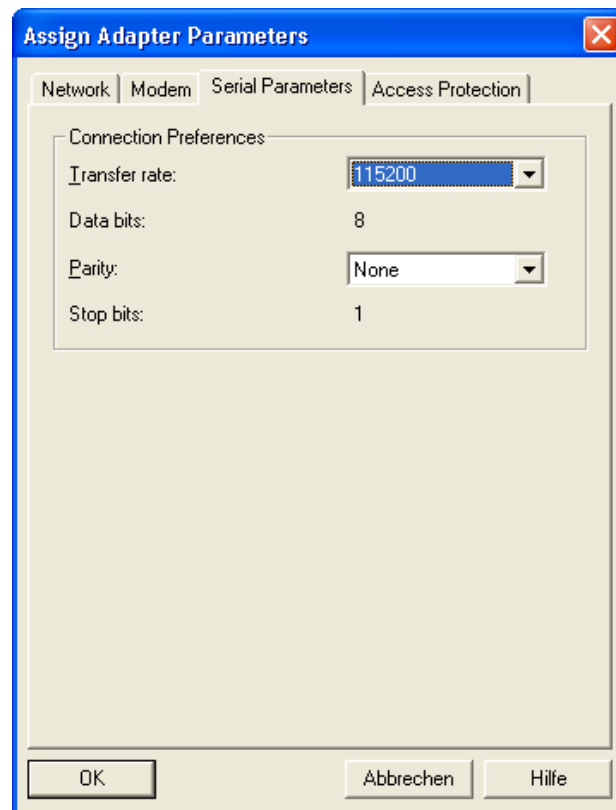


*For call-back from GSM to an ISDN modem, further parameters must be set.*



### 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 SSW7-TS with GSM modem can be configured to permit teleservice via the TeleService software only with the relevant authorization.



Assign Adapter Parameters															
Network	Modem	Serial Parameters	Access Protection												
<table border="1"> <thead> <tr> <th>Administrator</th> <th>Password</th> <th>Callback number</th> </tr> </thead> <tbody> <tr> <td>ADMIN</td> <td>XXXXXX</td> <td></td> </tr> </tbody> </table>				Administrator	Password	Callback number	ADMIN	XXXXXX							
Administrator	Password	Callback number													
ADMIN	XXXXXX														
<table border="1"> <thead> <tr> <th>User</th> <th>Password</th> <th>Callback number</th> </tr> </thead> <tbody> <tr> <td>Martin</td> <td>XXXXXX</td> <td>08154711</td> </tr> <tr> <td>Konrad</td> <td>XXXXXX</td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table>				User	Password	Callback number	Martin	XXXXXX	08154711	Konrad	XXXXXX				
User	Password	Callback number													
Martin	XXXXXX	08154711													
Konrad	XXXXXX														

OK Abbrechen Hilfe



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

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 SSW7-TS with GSM modem 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

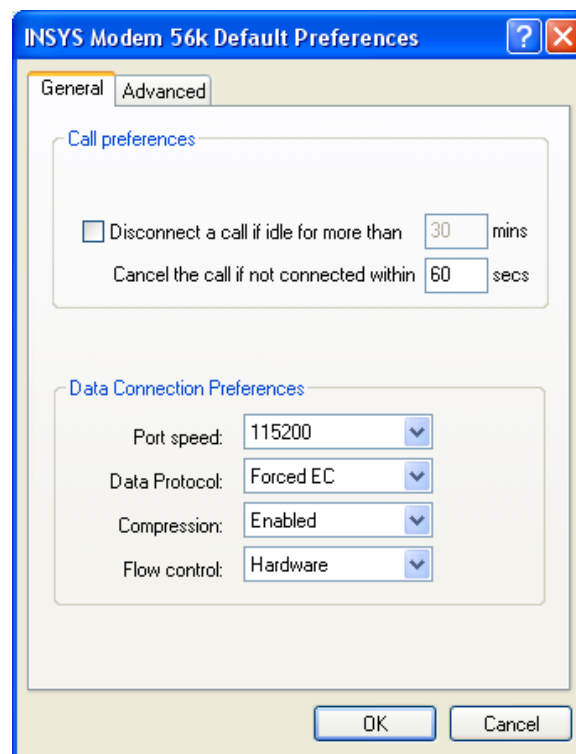
The points described here show some typical errors that can occur in day-to-day work with the SSW7-TS with GSM modem.

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

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 bps) 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 Helmholtz 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. If I dial up the GSM module with a phone, I get the dial tone.

A: In this case, the SIM card used is definitely not activated for the incoming data service, or you have dialed the wrong number (see below).

F: I normally use my SIM card for phoning with the cell phone. Can I also use this card for the SSW7-TS with GSM modem with a GSM modem?

A: Most SIM cards are only valid for voice communication. Your provider must assign you a phone number for data. Theoretically one SIM card can have up to three different numbers. For example:

1st number: 0151/12345678912	For voice comm. only
2nd number: 0151/12345678913	For data services only
3rd number: 0151/12345678914	For fax services only

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 Helmholtz GmbH.

## 8 Appendix

### 8.1 Technical Data

Device type	700-751-8GS21 (GSM)
Degree of protection	IP 30
Dimensions	135 x 67 x 30 mm <sup>3</sup> (LxWxH)
Weight	approx. 240 g
Operating voltage	+24 V DC $\pm$ 25 %, %, external or via the programming device
Current consumption	Typically 150 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)
<b>MPI</b>	
- Interface (front)	9-way Sub D socket / RS485, isolated
- connecting cable	1,2 m flexible control line with copper shield netting
- Transmission rates	19.2 kbps or 187.5 kbps
<b>RS232</b>	
- Interface	RS232, serial asynchronous
- Transmission rate	9.6 kbps to 115.2 kbps
<b>Modem</b>	
- Interface (internal)	RS232, V.24/V.28
- Transmission rate	9.6 kbps to 115.2 kbps
- Antenna connection	FME connector
- SIM card type	3V SIM card
- Transmission performance	Class 4 (2 W) for GSM 850 / EGSM 900 Class 1 (1 W) for DCS 1800 / PCS 1900
- GSM frequency bands	GSM 850, EGSM 900, DCS 1800, PCS 1900
- GSM/DCS certification GCF-CC	V.3.16.0 and GT.01
- PCS certification	NAPRD.03 (V.2.10.1)

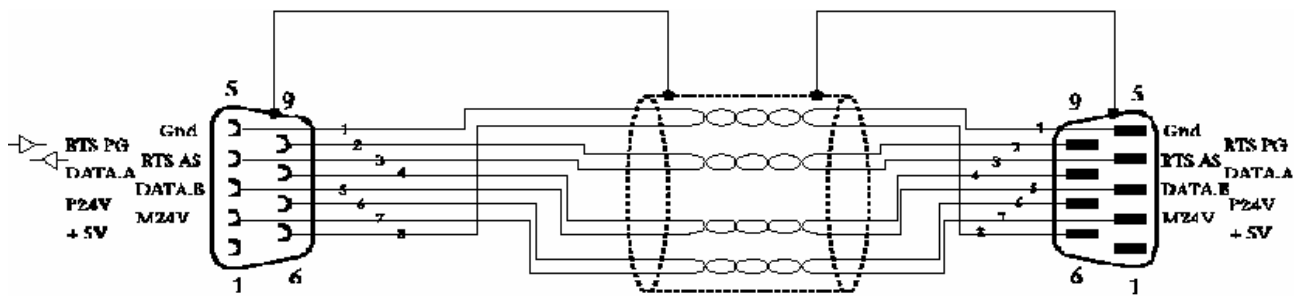
## 8.2 Pin assignments

### 8.2.1 Assignment of the MPI interface

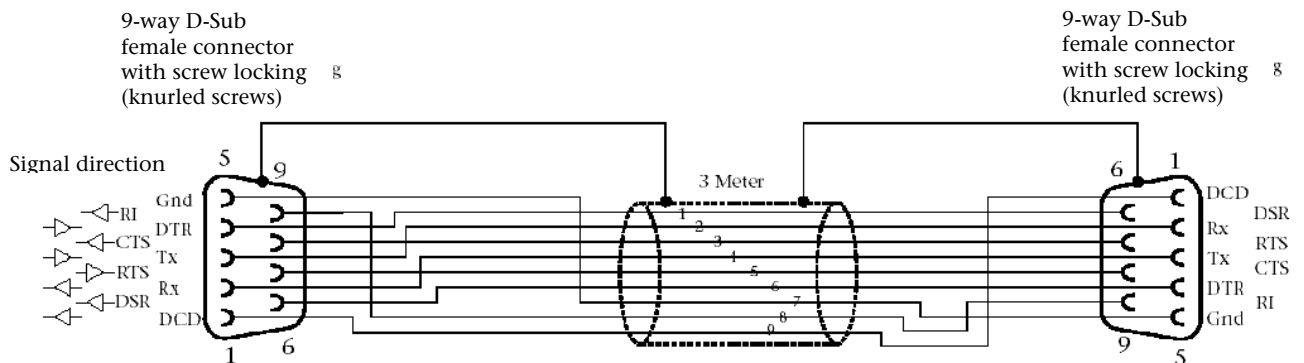
Connect or	Signal	Meaning
1	-	unused
2	-	unused
3	RxD- / TxD-P	receive / transmit data-P
4	RTS_AS	CPU transmit ID
5	DGND	Ground for bus termination (looped through)
6	DVCC	5 V DC for bus termination (looped through)
7	-	unused
8	RxD / TxD-N	receive / transmit data-N
9	RTS_PG	Programming device transmit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

### 8.2.2 Connecting cable

MPI extension cable (700-751-6VKx1):



PG/PC to SSW7-TS for direct operation or use of the modem (700-751-7VK81):



### 8.2.3 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 Further documentation**

Internet:

<http://www.helmholz.de>

<http://www.siemens.com>

## Notes