

TAINY *GMOD-T1*

Installation Manual





Safety precautions

General: The product TAINY GMOD-T1 complies with European standard EN60950, 05.2003, Safety of Information Technology Equipment.

Read the installation instructions carefully before using the device.

Keep the device away from children, especially small children.

The device must not be installed or operated outdoors or at damp locations.

Do not operate the device if the connecting leads or the device itself are damaged.

External power supply: Use only an external power supply which also complies with EN60950. The output voltage of the external power supply must not exceed 30VDC. The output of the external power supply must be short-circuit proof.

When connecting to a battery or accumulator, make sure that an all-pole circuit-breaker (main battery switch) with sufficient selectivity and a fuse with sufficient selectivity are provided between the device and the battery or accumulator.

Please pay regard to section *Technical Data* of the installation manual, as well as the installation and utilisation regulations of the respective manufacturers of the power supply, the battery or the accumulator.

SIM card: To install the SIM card the device must be opened. Before opening the device, disconnect it from the supply voltage. Static charges can damage the device when it is open. Discharge the electric static of your body before opening the device. To do so, touch an earthed surface, e.g. the metal casing of the switch cabinet. Please pay regard to section *Inserting or changing the SIM card* of the installation manual.

Handling cables: Never pull a cable connector out of a socket by its cable, but pull on the connector itself. Cable connectors with screw fasteners (D-Sub) must always be screwed on tightly. Do not lay the cable over sharp corners and edges without edge protection. If necessary, provide sufficient strain relief for the cables.

For safety reasons, make sure that the bending radius of the cables is observed.

Failure to observe the bending radius of the antenna cable results in the deterioration of the system's transmission and reception properties. The minimum bending radius static must not fall below 5 times the cable diameter and dynamic below 15 times the cable diameter.

Radio device: Never use the device in places where the operation of radio devices is prohibited. The device contains a radio transmitter which could in certain circumstances impair the functionality of electronic medical devices such as hearing aids or pacemakers. You can obtain advice from your physician or the manufacturer of such devices. To prevent data carriers from being demagnetised, do not keep disks, credit cards or other magnetic data carriers near the device.

Installing antennas: The emission limits as recommended by the Commission on Radiological Protection (13/14 September 2001) must be observed.

Installing an external antenna: When installing an antenna outdoors it is essential that the antenna is fitted correctly by a qualified person. Lightning Protection Standard VDE V 0185 Sections 1 to 4, in its current version, and further standards must be observed.

Lightning protection category for buildings: For outdoor installation, the antenna may be fitted only within the lightning protection zones O/E or 1. These lightning protection zones are prescribed by the lightning protection spherical radius.

The EMV lightning protection zone concept is to be observed. To avoid large induction loops a lightning protection equipotential bonding is to be used. If the antenna or antenna cable is installed near to the lightning protection system, the minimum distances to the lightning protection system must be observed. If this is not possible, insulated installation as described in VDE V 0185 Sections 1 to 4, in its current version, is essential.



Warning !

This is a class A equipment. This equipment can disturb other electric equipment in living areas; in this case the operator can be demanded to carry out appropriate measures.

Product no. 3159

Doc. no. 3159AD001 Rev. 1.3

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1 Introduction

The TAINY GMOD-T1 serves the following purpose:

- GPRS modem The device establishes data connections by radio via a GSM network
 - GSM data modem
 - GSM fax modem
 - SMS adapter
- IP connections via the GPRS (**General Packet Radio Service**) of a GSM network (**Global System for Mobile Communication** = mobile radio network).
 - Modem connections by CSD (**Circuit Switched Data**)
 - Fax connections
 - Sending and receiving SMS (**Short Message Service**)

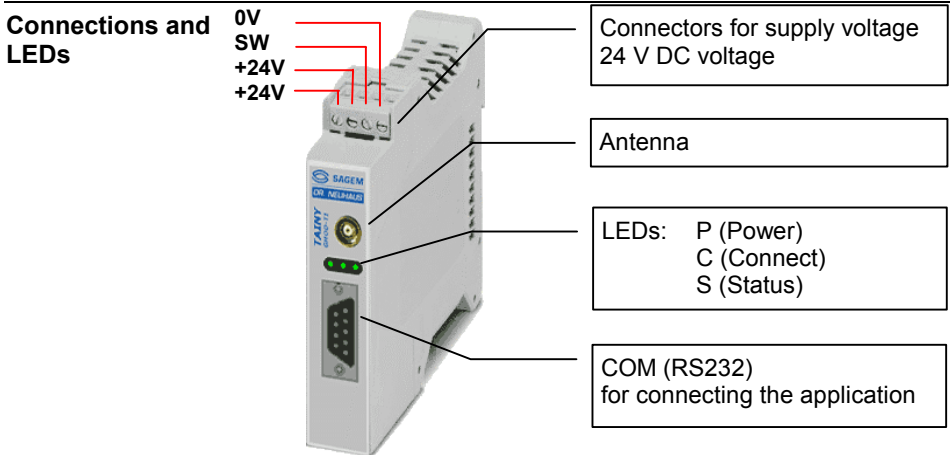
1.1 Operating condition: GPRS subscriber contract

To be able to use the TAINY GMOD-T1 ...	Use of the TAINY GMOD-T1 requires: <ul style="list-style-type: none">• a subscriber contract with a GSM network operator (e.g. TD1, Vodafone, E-Plus, O2) that supports GPRS• release of the GPRS service for the user in question by the network operator
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2 Putting the device into operation

To put the device into operation, perform the following steps in the order given:

		Page
1.	Inserting or changing the SIM card	7
2.	Connecting the device	11
3.	Installing the modem driver under Windows	13
4.	Setting up the dial-up connection (under Windows)	17



LED	Status	Meaning
P (Power)	On permanently	Operating voltage on
	Off	No operating voltage
C (Connect)	On permanently	GSM connection active (DCD on)
	Off	No GSM connection
S (Status)	Blinking regularly	Device booked into GSM network
	Flickering	Data exchange at COM port
	Off	Device not booked into GSM network

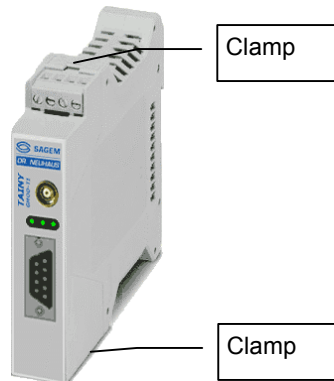
2.1 Inserting or changing the SIM card

- ➡ The device must be switched off when you insert or change the SIM card.
- ➡ A plug-in SIM card (3 V) is used.

1. Make sure that the device is disconnected from the supply voltage.

2. The TAINY GMOD-T1 must be opened to insert the SIM card.

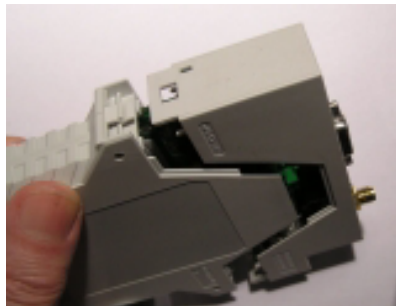
The housing is fastened by two clamps, one on top of the housing and one on the bottom side.



3. With a suitable object press one of the clamps cautiously (see picture) so that the catch opens.



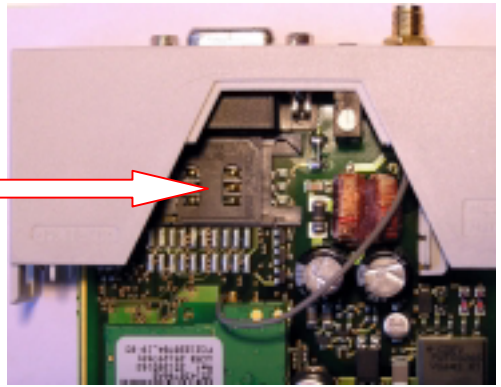
4. Remove the rear section of the housing.



Putting the device into operation

5. The SIM card holder is visible on the motherboard.

SIM card holder

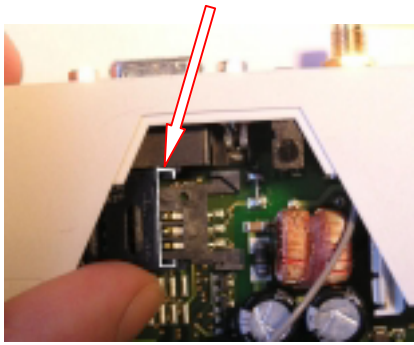


6. With a suitable object open the flap of the SIM card holder by moving it cautiously about 2 mm to the left - in the direction of the arrow (see red arrow in the illustration) so that it can be raised.

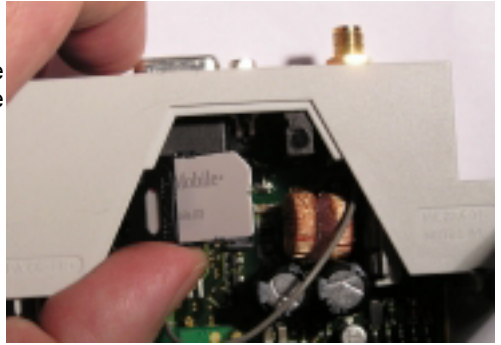


7. Raise the flap of the SIM card holder so that you can insert the SIM card.

In the illustration below, the compartment into which you can insert the SIM card is emphasized in white.



- Slide the SIM card into the flap of the SIM card holder, with the gold-coloured microchip pointing down. The flap has a groove for this purpose. The notched corner of the SIM card has to point towards the front of the device (see illustration).



- Slide the SIM card down into the flap as far as possible.

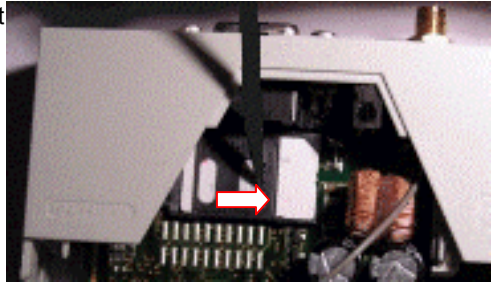


- Lower the flap paying attention to the notched corner of the SIM card (see illustration).



Putting the device into operation

11. With your fingernail or a suitable object move the flap about 2 mm to the right (in the direction of the arrow) until you can feel it click into place.



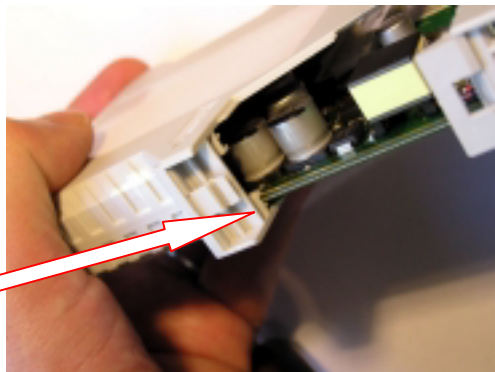
12. Now the SIM card holder is locked into position.



13. Finally re-attach both housing parts: Slide the motherboard into the rails on top and bottom inside the rear section of the housing. Close the housing by slightly pressing both housing parts together so that the clamps on the upper and lower part of the housing engage.

The housing is locked when both clamps have clicked shut.

Rail



2.2 Connecting the device

Antenna The antenna connector – SMA socket - is situated on the upper part of the front.
Impedance recommended: ca. 50 Ohm

Connectors for current supply The screw terminals on the top of the device are for connecting the current supply:
24 V DC voltage (nominal), $I_{typ.}$ 220mA@24V. (Please also refer to chapter *Technical Data*, page 29.)

+ 24 V
+ 24 V

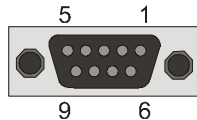
SW (12-30VDC)
0 V

Both screw terminals to the left (24 V) are internally connected.

Switch input SW: If unused, the two middle screw terminals (+24V and SW) have to be bridge-connected.



Serial interface COM



Serial port V.24/V.28 to connect a data terminal, e.g. a PC.

The RS-232 connecting cable must not exceed a length of 15m.

Pin assignment:

1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI
5	SGND		

2.3 Switching the device on/off

Make sure that the TAINY GMOD-T1 is connected correctly (see chapters *Connecting the device* and *Technical Data*).

Switching on... The device switches on as soon as the operating voltage is supplied and the switch input (SW) is active.

Switching off the GSM engine (Recommended) Switch off the GSM module with the AT command **AT+CPOF** before disconnecting the device from the supply voltage. This is the only way to ensure that it logs off correctly from the GSM network.

Switching off... The device switches off when disconnected from the supply voltage.

2.4 Installing the modem driver under Windows

If the device is operated with a computer running under Windows we recommend that the supplied modem driver is installed.

The following instructions show dialogue boxes that are displayed during installation under Windows XP. If you are using a different Windows version (Windows 2000), proceed accordingly.

Under Windows 2000 or Windows XP you must be registered as the administrator. In addition please make sure that no other modem drivers are or will be installed for the respective interface.

Follow the instructions below and those on your screen:

1. Insert the supplied CD in the CD-ROM drive.
If an action is started automatically, interrupt it.

-
2. Click on **Start, Control Panel**.

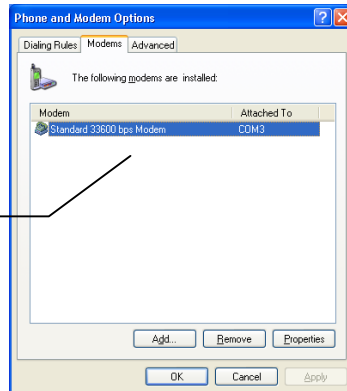
Consequence:

The *Control Panel* dialogue box is displayed. Where required, *Switch to classic view*.

Double-click on **Phone and Modem Options**.

3. Consequence: The *Phone and Modem Options* dialogue box is displayed.

Example:
1 modem driver
is installed

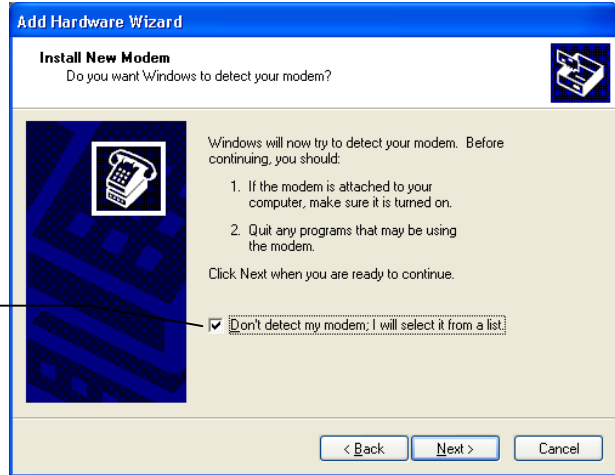


On the *Modems* tab, click on **Add...**

4. The *Add New Hardware Wizard* for the installation of a new modem appears.

When this dialogue box is displayed...

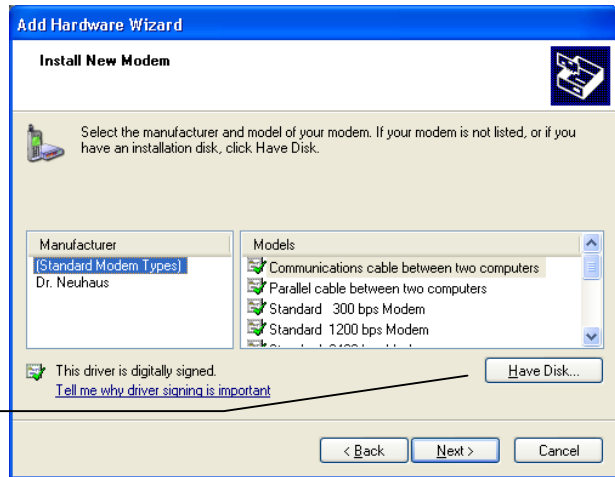
Select **Don't detect my modem; I will select it from a list.**



Select **Don't detect my modem; I will select it from a list.** Then click on **Next >**.

5.

Click on **Have Disk...**

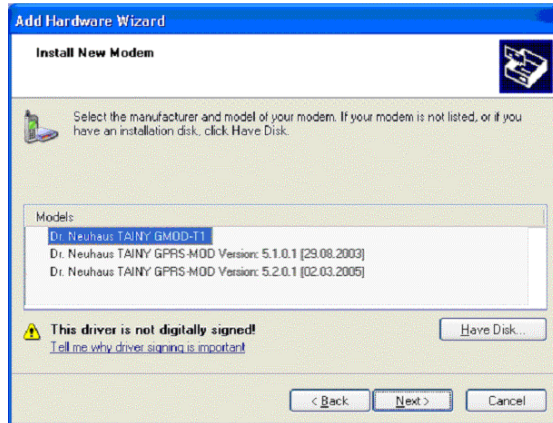


Click on **Have Disk.....**

6. In the next dialogue box, change to the inserted CD-ROM and then to the *Driver* folder.

Select: **TAINY_MOD_T1.INF**

Follow the instructions on the screen.

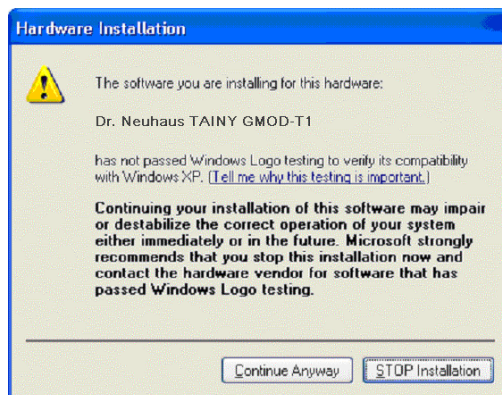


Click on **Next >**.

7. Next you are asked to select a COM port.
Select the COM port of the computer to which the device is connected.

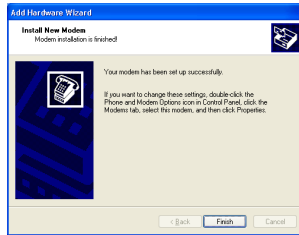
Then click on **Next >**.

8. When this dialogue box is displayed...



Click on **Continue Anyway**.

9.



Click on **Finish**.

10. When installation is completed the installed modem driver will be listed in the *Phone and Modem Options* dialogue box.

Click on **OK** to close the window.

2.5 Setting up the dial-up connection (under Windows)

Purpose of the dial-up connection

In order to be able to establish a GPRS connection using the PPP (Point to Point) Protocol you must set up a dial-up connection under Windows.

The PPP Protocol is used, for example, for dial-up connections to the Internet or to a private network which uses the IP Control Protocol (IPCP). It facilitates the transport of IP data packets via a PPP connection.

It is not necessary to set up a dial-up connection for

Not necessary for:

- data transfer, e.g. by terminal program
- fax transmissions
- SMS (Short Message Service)

Set up the dial-up connection

The following instructions show dialogue boxes that are displayed when setting up a dial-up connection under Windows XP. If you are using a different Windows version (Windows 2000), proceed accordingly.

Under Windows 2000 or Windows XP you must be registered as the administrator.

Requirements:

You have installed the modem driver (see page 13)

Follow the instructions below and those on your screen:

1. Click on **Start, Control Panel**.

Consequence:

The *Control Panel* dialogue box is displayed.
Where required, *Switch to classic view*.

Double-click on **Network Connections**.

Consequence:

The *Network Connections* dialogue box appears.

Click on **Make New Connection**.

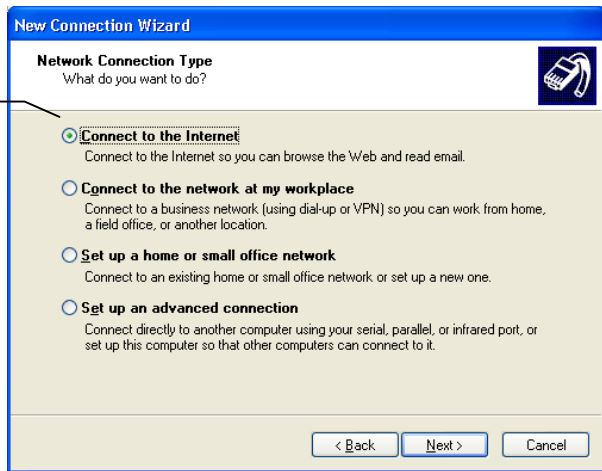
2. The *New Connection Wizard* is launched.



Click on **Next >**.

3.

Select **Connect to the Internet**.

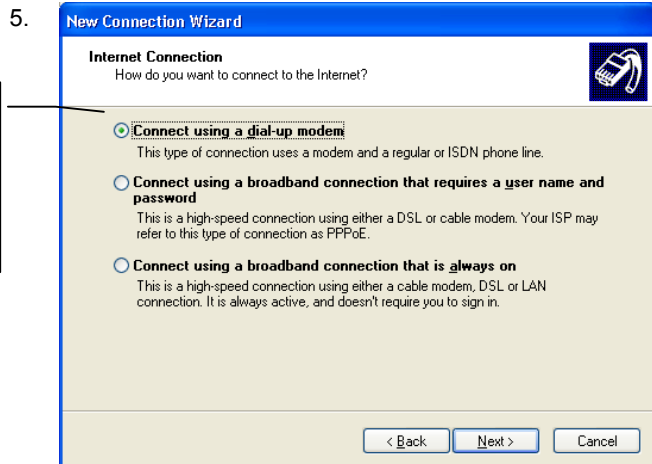


Select **Connect to the Internet** and click on **Next >**.



Select **Set up my connection manually**

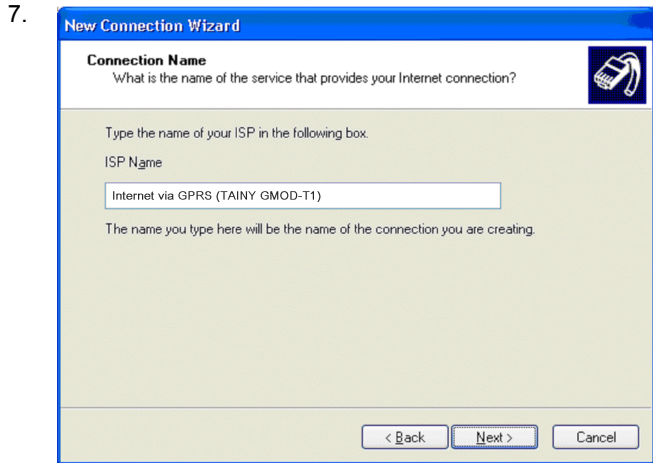
Select **Set up my connection manually** and click on **Next >**.



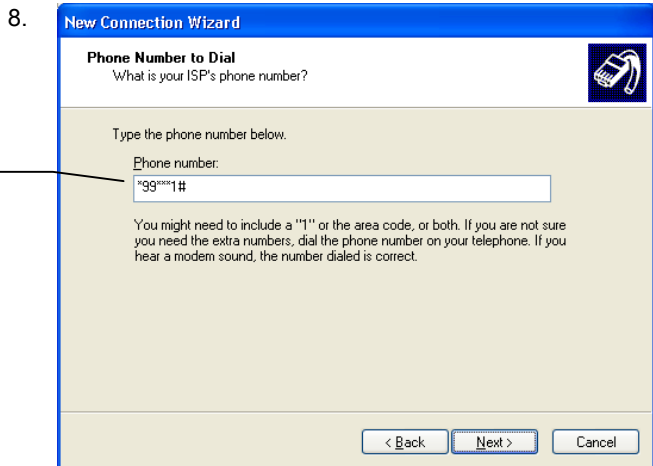
Select **Connect using a dial-up modem**

Select **Connect using a dial-up modem** and click on **Next >**.

6. When you are asked to choose a modem, select:
Dr. Neuhaus TAINY GMOD-T1



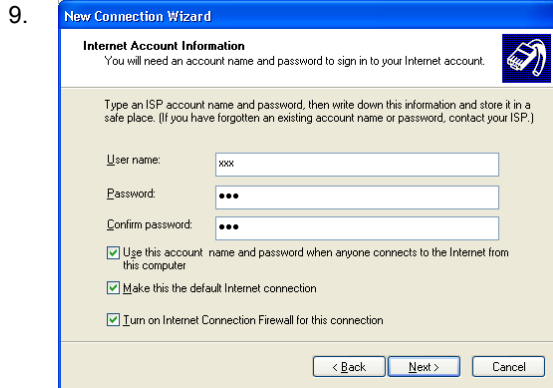
Give the dial-up connection (service) a name that describes your purpose. Then click on **Next >**.



*99***1#

Type the phone number for access to the Internet: ***99***1#**
Then click on **Next >**.

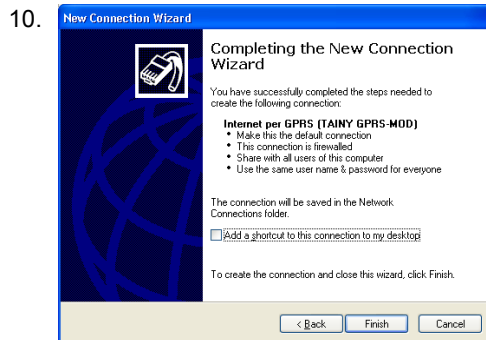
- In the corresponding dialogue box under Windows 2000, deactivate the option *Enter Your Area Code and Local Access Number!*



Enter your user name and password here.

You will find them in your subscription contract. Or you can ask your mobile telephone company for these details.

Click on **Next >**.



Click on **Finish**. You have finished setting up the dial-up connection.

DNS server address To enter „normal“ Internet addresses (e.g. *www.neuhaus.de*) in your browser when using the Internet service World Wide Web, your browser needs to access a DNS server. The DNS server returns the IP address under which your browser may then find the respective website.

The DNS server of your network operator for GPRS connections is configured in the dial-up network connection. In order to do so, please proceed as follows:

1. Open the *Properties* dialog box of the dial-up network connection for the **COM** interface of the TELSAT GPRS. (With the right mouse button click on the connection icon and then select *Properties* in the context menu.)
2. Enter the IP address of the DNS server of your network operator under **TCP/IP** configuration.

Info: Please look up your subscription for the IP address of the DNS server. If the IP address should not be mentioned there, please contact the hotline or website of your network operator.

3 Operation

To operate the device, you have to enter the PIN (**P**ersonal **I**dentification **N**umber) of the inserted SIM card, as well as the APN (**A**ccess **P**oint **N**ame). The APN denotes the destination of GPRS connections.

- ➡ The PIN and the APN are not stored in the TAINY GMOD-T1. They must be entered every time the GSM module or the complete device is switched on.
- ➡ The PIN and APN can also be set via AT commands.

Controlling with applications

Generally speaking, the application or application program that you execute on the connected computer will control the device. This means that the commands for the establishment and closure of a data or voice connection via GSM or GPRS network are issued to the device by the application. To do so, the application communicates with the device via AT commands as with any other modem. You will find a list of all supported AT commands in the PDF file *AT Command Set* on the CD supplied.

The various functions of the device are not necessarily all operated by the application used. Therefore please note the following points:

- Switching the device on/off- see page 12.
- Switching off the GSM engine – see page 12.
- The PIN and APN must be entered every time the device is switched on.
- Connections for which the PPP Protocol is used, e.g. GPRS connections to the Internet, may have to be initiated manually - see page 25.

Controlling direct with AT commands

You can also make the device perform the required functions by giving it direct AT commands. In this case, you can use any terminal program to enter the AT commands. (See *Working with a terminal program*, page 26.)

Or you can program your own communication program designed specifically to suit your purposes.

- ➡ You will find a list of AT commands in the PDF file *AT Command Set* on the CD supplied. (Please note that voice functionality is not supported).

Enter PIN first

Please enter the PIN first before any other AT commands. Until a PIN has been entered most AT commands will be answered with ERROR.

3.1 Setting the PIN and APN

Enter PIN

The PIN is set with the following command:

AT+CPIN="xxxx"

Please also refer to chapter *Working with a terminal program*, on page 26.

Set APN

This is, for example, the standard APN of your GSM network operator for access from the GPRS network to the Internet (for T-Mobile in Germany it is: **internet.td1.de**). Or it is the APN for access to your corporate network, which must be connected directly to the GPRS network.

The APN is set with the command:

AT+CGDCONT=1,"IP","<APN>","0.0.0.0",0,0

Please also refer to chapter *Working with a terminal program*, on page 26.

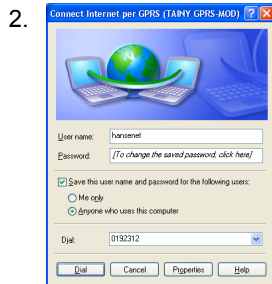
- ➡ The PIN and the APN are not stored in the TAINY GMOD-T1. They must be entered every time the GSM module or the complete device is switched on.

3.2 Establishing and closing GPRS or Internet connections

In order to make a connection with a host on the Internet or a private network that is permanently linked to the GPRS network using a Web browser or e-mail client you must first establish a dial-up connection to the Internet.

Making the connection

1. Double-click on the icon representing the connection
Consequence:
The dialogue box for making a connection appears.



Click on **Dial**.



When the connection has been established an icon appears in the bottom right of the screen to indicate the active connection.

To use Internet services, launch the appropriate program, e.g. your Web browser or your e-mail program.

Closing the connection

1. Right-click on the icon (bottom right of screen) indicating the active connection in order to open the context menu.
2. In the context menu, click on **Close connection**.

4 Entering AT commands

The device is controlled via AT commands that are transmitted to it either by the connected application or by manual entry via a terminal program, e.g. *HyperTerminal*.

Enter PIN first Please enter the PIN first before any other AT commands. Until a PIN has been entered most AT commands will be answered with **ERROR**.

Working with a terminal program To be able to control the device directly via AT commands, use a terminal program, e.g. *HyperTerminal*.

Note the following settings:

Make the connection: via the TAINY GMOD-T1 driver
 or
 directly via the COM port to which the
 device is connected

Speed: 57600 bps

Data bits: 8

Parity: **(No)**

Stop bits: **1**

Duplex: **(Full)**


Enabling/disabling local echo


To see your entries on the screen, you may have to enable the local data echo. To do so, enter the following command: **ATE1**

To disable the local data echo, enter the following command: **ATE0**




4.1 The AT command language

Syntax

The AT command language is a standard for controlling modems. It is line-orientated. Each command line begins with **AT** (for ATtention), followed by the actual command, and ends with  (Enter key).

Example: ATD444444 
 means: dial (D for Dial) 444444

There are only two exceptions to this rule:

The command    to switch to Command Mode (see below) and the command **AT** with which the last command line is repeated.

Command Mode, Transparent Mode

The device accepts AT commands only when it is in Command Mode.

It is in *Command Mode*,

- when there is no active connection,
- when the sequence Pause +++ has been entered during a connection.

The device does not accept AT commands when it is in Transparent Mode.

It is in *Transparent Mode*,

- when there is an active connection,
- when the device has been switched to Command Mode during an active connection with +++ and then switched back to Transparent Mode with **ATO**.

4.2 Some AT commands

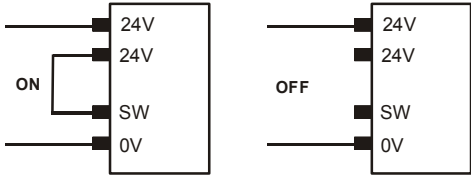
Command	Explanation	Reply from device
AT+CPIN="xxxx"	Enters PIN	OK /ERROR
AT+CPIN?	Checks PIN status	READY / SIM PIN
AT+CGDCONT=1,"IP","<APN>" ,"0.0.0.0",0,0	Sets APN	OK /ERROR
AT+CREG?	Checks status in GSM network	+CREG 0,1 (registered) +CREG 0,3 (reg. denied) +CREG 0,5 (roaming)
AT+CSQ	Checks signal quality	+CSQ: xx,99 0 < xx < 31 xx should be greater than 10. The minimum is 5
ATD<nnn> (without semi-colon)	Dials the number <nnn> (data, fax, GPRS connection)	CONNECT BUSY NO CARRIER
ATA	Accept incoming call	OK
+++ ATH	Disconnect data connection	OK

➡ You will find a list of AT commands in the PDF file *AT Command Set* on the CD supplied. (Please note that voice functionality is not supported).

5 Technical Data

Application interface (COM)	Control	AT commands
	Standard	RS-232 (V.24 / V.28)
	Speed	300 bit/s up to 57.600 bit/s
Network interface	GSM engine	GPRS / CSD / Triple band
	GPRS	Multislot Class 10: up to 2 uplinks / up to 4 downlinks (max. 5 slots); coding schemes: CS-1, CS-2, CS-3, CS-4
	SMS	MO/MT/CB
	Transmitting power	GSM - 900 MHz (max. 2W) DCS – 1800 MHz (max. 1W) PCS – 1900 MHz (max. 1W)
	Antenna connector	Impedance nominal: 50 Ohm, socket: SMA
Voltage supply	Input voltage	12-30 VDC (24VDC nominal)
	Input current	I _{typ.} 430mA@12V (I _{Peak} 1,2A), I _{typ.} 220mA@24V
	Switch input	I _{switch} max. <1mA
Ambient conditions	Temperature range	Operating: -20°C up to +70°C (>55°C Derating) Storage: -25°C up to +85°C
	Humidity	0-95 %, non condensing
Housing	Construction	Top-hat rail housing
	Material	Synthetic material
	Protection category	IP40
	Dimensions	114 mm x 22,5 mm x 99 mm (W x L x H)
	Weight	Ca. 150g
Approvals	CE, R/TTE (GSM), GSM/GPRS engine with GCF approval	
	EMV/ESD	EN 55024 EN 55022 Class A EN 61000-6-2
	Electrical Safety	EN 60950
Accessories	Antenna	Device Antenna, Station Antenna Indoor, Flat antenna, Station Antenna Outdoor
	Power supply unit	Power Supply Unit (top-hat rail mounting), Input nom.: 100-240VAC
	Miscellaneous	Adapter DB9<-> Screw terminal strip
Scope of delivery	Device, CD with installation manual/modem driver	
Order no.	TAINY GMOD-T1, article no.: 315902	

Switch input



Iswitch max. <1mA

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