

TAINY LMOD-S1

User Manual



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Safety precautions

General: The TAINY LMOD-S1 product complies with European norm 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.

Do not install or operate the device outdoors or at damp locations.

Do not operate the device if any of the connecting cords or the device itself are damaged.

External power supply: Make sure to use nothing other than an external power supply that 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 a battery or an accumulator, make sure that a circuit breaker (main battery switch) with sufficient selectivity and a fuse with sufficient selectivity are installed between the device and the battery or accumulator.

For further information, see the section on *Technical Data* in this user manual as well as the installation and operation regulations of the respective manufacturers of the power supply and the battery or the accumulator.

How to handle cables: Never pull a cable connector out of the socket by the cord, but make sure to pull on the connector itself. Cable connectors with screw fasteners (D-Sub.) must always be screwed down tightly. Do not lay cable around sharp corners or over sharp edges without edge protection. Ensure that the cables are long enough to prevent any undue strain.

For safety's sake, make sure that the cables are not bent beyond their bending radius.

The minimum bending radius must not fall below 5 times the cable diameter statically and 15 times the cable diameter dynamically.



Warning !

Please note that data packets are also exchanged each time a connection is (re-)established, an attempt is made to connect with the receiver (e.g. server switched off, incorrect destination address, etc.) and for keeping the connection alive. This is particularly important when you are using networks that levy a per-packet charge!

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1 Introduction: The TAINY LMOD-S1

The TAINY LMOD-S1 is part of the TAINY Connect, a transmission system for wired and wireless M2M (Machine to Machine) communication based on IP networks.

Made up of several TAINY Connect terminal devices – a number of different AT, meter and leased-line modems for TCP/IP networks - and a central “switching center” – the TAINY SwitchingCenter respectively the TAINY ModemServer – this system uses wired and wireless TCP/IP networks for transfer of the data.

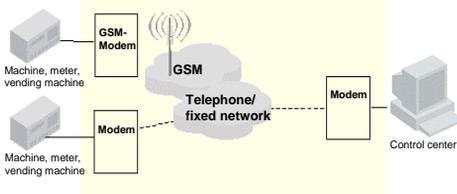
Using the TAINY SwitchingCenter / TAINY ModemServer and the TAINY Connect terminal devices – based on hard and software - it is possible to set up an individual “TCP/IP private branch exchange”, which machines, programmable logic controllers (PLC), vending machines, meters, control centers and other devices can use to communicate with one another – with connections all over the world, anywhere where there is access to a TCP/IP network (Internet, Intranet or GPRS).

The machines, PLCs, vending machines, meters and control centers, etc., are connected to the TAINY Connect terminal devices via their serial interfaces. The TAINY Connect terminal devices respond just like conventional analog or GSM modems that are connected to public switching centers or private branch exchanges. The connection is established in combination with the TAINY SwitchingCenter/ModemServer, whereby the TAINY SwitchingCenter or TAINY ModemServer serves as a switching center and allows data exchange between the devices via leased line or dial-up connection.

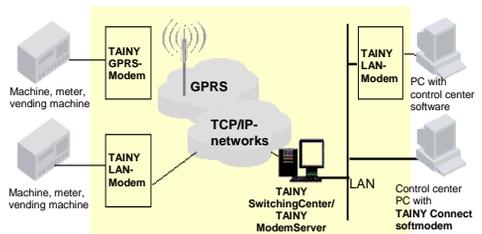
Example:

Data communication: Process <-> Control center

Previously

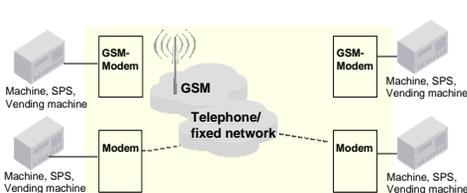


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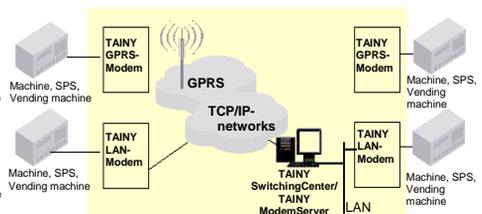


Data communication: Process <-> Process

Previously



Today



The TAINY LMOD-S1 as a TAINY Connect terminal device

TCP/IP data communication for machines that do not support TCP/IP

The device establishes bi-directional data connections via such wired TCP/IP networks as the Intranet and/or the Internet.

The TAINY LMOD-S1 provides the communication required via TCP/IP protocol. In other words: the TAINY LMOD-S1 establishes communications via TCP/IP protocol for applications (devices, machines, computers, etc.) that do not support TCP/IP.

The TAINY LMOD-S1 is connected with the application via its serial interface. These applications could be: machines, programmable logic controllers (PLC), vending machines, control centers, and much more.

Practical examples

- Collecting data from electricity, water or gas meters, from vending machines or fill-level sensors
- Remote maintenance
- Transmission of alarm messages
- High-speed data transmission for electronic payments
- Machine monitoring
- Vending machine monitoring
- Transmission of weather data

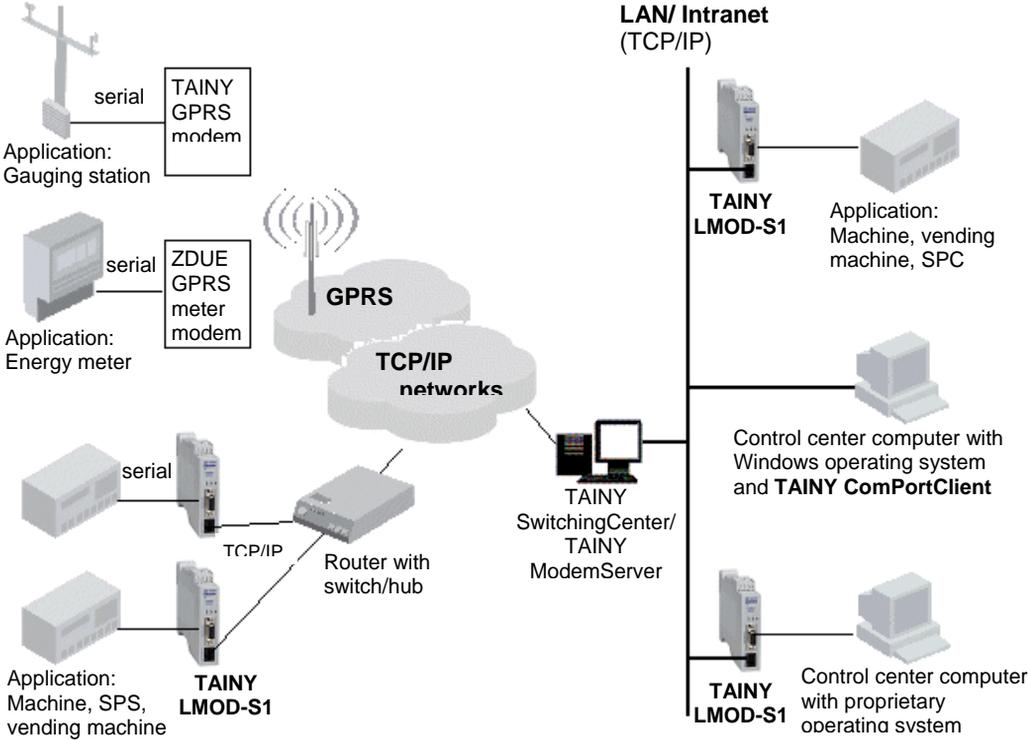
The TAINY LMOD-S1 is ideally suited to enable communication between all M2M (Machine-to-Machine) or programmable logic controllers (PLC) applications.

2 Connection Routes

2.1 Connection routes via the TAINY SwitchingCenter / TAINY ModemServer:

The TAINY SwitchingCenter / TAINY ModemServer can be used for data communication via the TCP/IP protocol in the following ways:

Application ↔ Control center and Application ↔ Application



Any application connected to the TAINY LMOD-S1 is able to communicate with any other application and/or with the control center at the local or remote location – and vice versa. The TAINY SwitchingCenter/ModemServer switches the connection via the Intranet and/or Internet.

TAINY SwitchingCenter/ModemServer as a switching center	All the connections made by the TAINY LMOD-S1 are directed via a PC with access to the Internet/Intranet as the switching center. This PC executes the TAINY SwitchingCenter / TAINY ModemServer. These software versions each function in practically the same way as a telecom private branch exchange: they can be used to establish dial-up connections or leased lines between any TAINY Connect clients. TAINY Connect clients include other TAINY LMOD-S1, TAINY GMOD-Sx (with wireless connection via GPRS) or a PC with control center software and a TAINY ComPortClient (CPC) installed. It makes no difference whether the TAINY Connect clients can be reached via GPRS, Internet or Intranet.
Control center	<p>There are two options with respect to the control center:</p> <ul style="list-style-type: none">• The control center software is executed on a PC running on a Windows operating system. In this case, the PC also executes the TAINY ComPortClient (CPC). This software provides the control center software with up to 255 virtual COM ports. These ports are used as before to access the remote applications, but now they do so via TCP/IP-based networks (Intranet, Internet, GPRS), via dial-up connection or via leased line, switched through the TAINY SwitchingCenter / TAINY ModemServer.• The control center software is installed on a computer <u>without</u> a Windows operating system (using a proprietary operating system). In this case, a TAINY LMOD-S1 is connected to the computer's serial interface to connect the computer, or rather the control center software executed on it, to the TAINY SwitchingCenter/TAINY ModemServer via the TCP/IP network and the computer can now communicate via dial-up connections or leased lines.
Dial-up connection mode CS	If the TAINY LMOD-S1 is controlled by modem commands issued by the application connected to it, the call number of another TAINY Connect client can be sent to it along with the ATD dial command. Then the TAINY SwitchingCenter/TAINY ModemServer will establish the connection to this TAINY Connect client. In this case, the TAINY LMOD-S1 is operating in the dial-up connection mode - CS (CS = C ircuit S witched).
Leased line mode LL	<p>If you cannot or do not want to use AT modem commands to control the connections, the TAINY LMOD-S1 can be operated in leased line mode - LL (LL = Leased Line). We can differentiate between 2 modes of operation here:</p> <ul style="list-style-type: none">• If the application connected to the TAINY LMOD-S1 emits the hardware-based DTR signal, the TAINY LMOD-S1 will connect

to another specific TAINY Connect client via the TAINY SwitchingCenter / TAINY ModemServer. As soon as the initiating application switches off the DTR signal, the line will be disconnected.

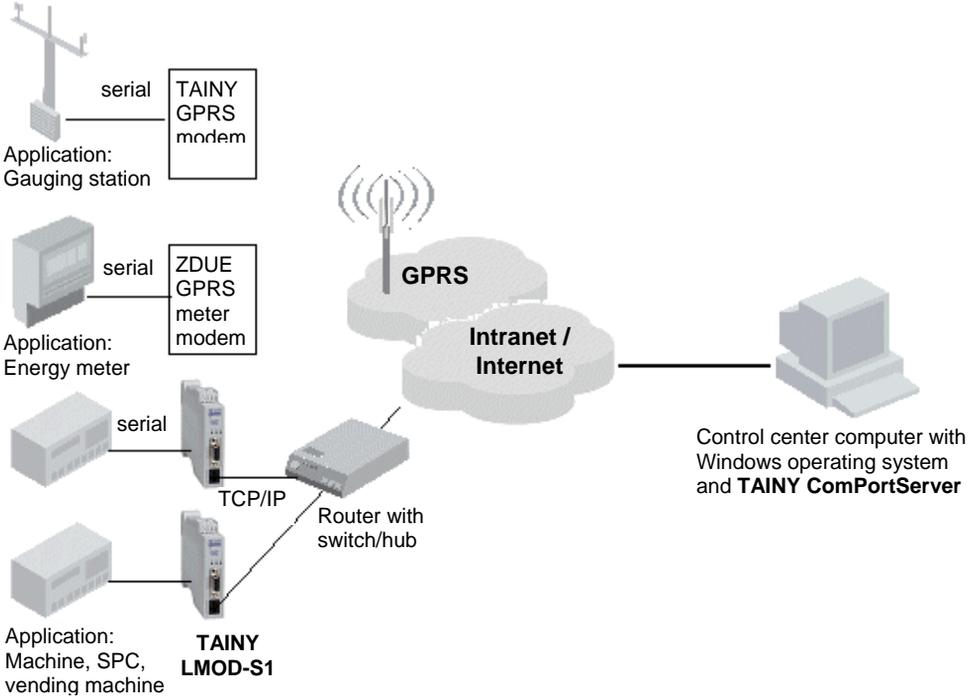
- If the application connected to the TAINY LMOD-S1 does not emit any signals to control the connections, the TAINY LMOD-S1 will maintain a permanent connection to another specific TAINY Connect client. The connection will be set up automatically as soon as the power supply is switched on ("always on").

The TAINY SwitchingCenter / TAINY ModemServer configures which pairs belong together for leased lines in both cases.

2.2 Connection routes via the TAINY ComPortServer (CPS):

The TAINY ComPortServer can be used for data communication via the TCP/IP protocol in the following ways:

Application ↔ Control center



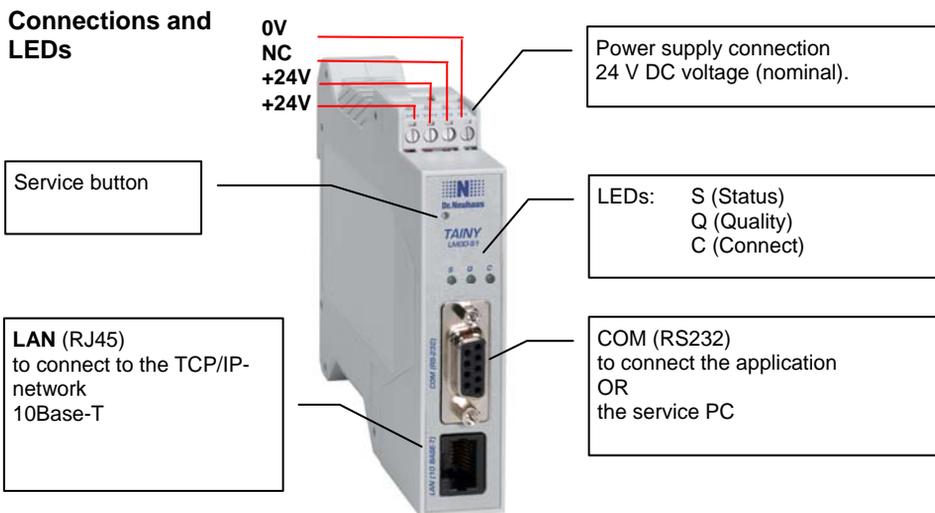
Any application connected to the TAINY LMOD-S1 can communicate with the control center – and vice versa. The TCP/IP connection is put through via the Intranet and/or Internet.

The receiver for the TAINY LMOD-S1 is a computer with Internet access on which the TAINY ComPortServer (CPS) is executed. This software provides the control center software with up to 255 virtual COM ports. These ports are used as before to access the remote applications, but now they do so via TCP/IP-based networks (Intranet, Internet, GPRS).

Leased line mode
LL

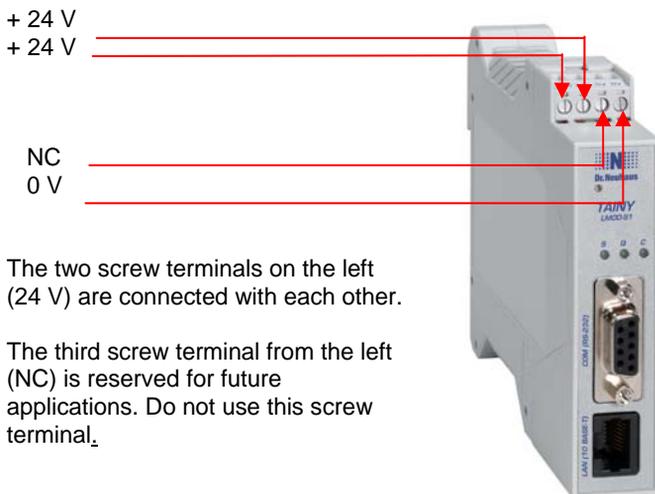
A leased line connection is established virtually between the TAINY LMOD-S1 and the control center computer on which the TAINY ComPortServer is installed. The TAINY LMOD-S1 is operating in *leased line mode (LL)*. In this connection mode, the TAINY LMOD-S1 can activate or deactivate the connection as soon as it receives the hardware signal DTR ON or OFF from the connected application. Alternatively, the connection can be permanently activated (Always On) as soon as the TAINY LMOD-S1 is supplied with the operating voltage, even if the connected application is not issuing any sort of control signal to the TAINY LMOD-S1.

3 Connections and LEDs



3.1 Power supply connection

The screw terminals at the top are used to connect the power supply source: 24 V DC voltage (nominal), $I_{typ.} 60mA@24V$. (Please also refer to the section *Technical Data*, S. 71.)



How to start The device will start as soon as the operating voltage is supplied.

3.2 The COM interface

For the application For applications that are to be connected locally (e.g. machine, vending machine, sensor, computer), the TAINY LMOD-S1 has been equipped with a V.24/V.28 interface (RS232), called COM. A V.24 cable can be used to connect any application that transmits data serially.

Data rate: Max. 57600 baud for outgoing and incoming data

If the application is equipped with a different interface, e.g. CAN, Ethernet or another industrial bus, a standard interface converter can be connected between the two.

For servicing

To configure the TAINY LMOD-S1, a PC is connected to the COM interface (instead of the application). The TAINY LMOD-S1 configuration program must be installed and ready to execute on this PC.

In order to enable the TAINY LMOD-S1 to interpret the signals received from the service PC as configuration or service commands, press the service button (min. 2 seconds, but less than 4 seconds) on the TAINY LMOD-S1 to switch it into the service mode.

Also refer to *The service button and its functions*, page 14.

3.3 The LAN interface (10Base-T)

LAN: To connect the device to the TCP/IP network

The TAINY LMOD-S1 is equipped with an RJ45 interface to connect the device to the TCP/IP network (Intranet/Internet) via Ethernet cable.

Also see the sections *Connection types* and *Technical Data*.

- ➊ Please make sure that the connection cable you use is a shielded twisted pair (STP) cable.

3.4 The service button and its functions

The service button



Service button

- The service button on the TAINY LMOD-S1 is pressed in order
- to read out the current IP configuration (<2 sec.)
- to switch the TAINY LMOD-S1 into the service mode to configure it (min. 2 sec., less than 4 sec.)
- to switch the device back into the application mode after it has been configured (min. 2 sec., less than 4 sec.)
- to perform a factory reset (> 4 sec.).

The service button is a recessed button located on the front of the device. Use a pointed object, such as a slightly straightened paperclip to press the service button.

Reading out the current IP configuration

To display the current IP configuration of the TAINY LMOD-S1, you would normally use the configuration program – see the *Configuration table*.

You can also read out the current IP configuration without using the configuration program. Instead, start a terminal program, e.g. HyperTerminal. Select the corresponding COM interface and set the character format and baud rate to the same values as used by the COM interface of the TAINY LMOD-S1.

(The TAINY LMOD-S1 default values are as follows:

Baud rate	57600
Character format	8N1

If you now press the service button (less than 2 sec.), the current IP configuration will be read out via the TAINY LMOD-S1 COM interface.

- device name
- Use of DHCP server: YES or NO
- Local IP address (allocated by the DHCP server, for example)
- MAC address
- Subnet mask used
- Gateway IP address
- DNS1 and DNS2
- Server IP address or host name
- Server destination port used (destination port number)
- Server source port used (local port number)
- System runtime since the last reboot

Switching to the service mode and back**Switching to the service mode and back**

1. Press the service button (min. 2 sec., less than 4 sec.) to switch the TAINY LMOD-S1 into the service mode.
Once the TAINY LMOD-S1 is in the service mode, the three LEDs will blink slowly all at the same time.
 2. Press the service button again (min. 2 sec., less than 4 sec.) to switch the device back into the normal application mode.
If the service button is not pressed to switch the TAINY LMOD-S1 back into the application mode, the device will switch back automatically after about 20 minutes.
-

Factory reset**Performing a factory reset**

Press the service button for longer than 4 seconds to reset the configuration of the TAINY LMOD-S1 to the default settings.

3.5 Top-hat rail mounting

The TAINY LMOD-S1 can be easily mounted on DIN EN 50022 top-hat rails. A corresponding fastener can be found on the back of the device.

3.6 Connecting and starting the device**How to connect the device**

Connect the device to your application computer, the network and the power supply. (Please refer to the information provided in the sections on *Connections and LEDs* and *Technical Data*.)
To configure the device, please refer to the information in the sections *Putting the device* into operation and *How to Configure the TAINY LMOD-S1* .

Switching on

The device will start as soon as the operating voltage is supplied.

3.7 LED functions: Overview

The device has been equipped with 3 LEDs to provide you with information on the current operating status:

S (Status) Q (Quality) C (Connect)

Sequence	LEDs				Meaning
	S	Q	C		
1	●	○	○	Flash quickly in sequence	Booting
2	○	●	○		
3	○	○	●		
1	●	○	○	Flash slowing in sequence	Update
2	○	●	○		
3	○	○	●		
1	●	●	●	Blink slowly at the same time	Service mode
2	○	○	○		
3	●	●	●		
1	●	●	●	Blink quickly at the same time	Error
2	○	○	○		
3	●	●	●		
1	●	○	○	Blink slowly	Waiting for network IP allocation (DHCP)
2	○	○	○		
3	●	○	○		
1	●	○	○	Blink quickly	Network configuration error
2	○	○	○		
3	●	○	○		
1	●	●	○	ON	IP address allocated or set, no connection to server (TAINY SwitchingCenter / TAINY ModemServer)
1	●	●	●	LED C blinks slowly	Connection to server (TAINY SwitchingCenter / TAINY ModemServer)
2	●	●	○		
3	●	●	●		
1	●	●	●	ON	Connection to receiver
1	●	●	●	LED C blinks at the same time as the data stream	Data transfer
2	●	●	○		
3	●	●	●		
1	●	●	●	LED S and C blink slowly at the same time, alternating with Q	Initiation of service mode or factory default reset
2	●	●	○		
3	●	●	●		

* During a firmware update, the LEDs will first blink slowly in sequence. As the process continues, only one of the LEDs will be ON.

LED display when the service button has been pressed

Sequence	LEDs				Meaning	
	S	Q	C			
1	●	○	○	ON	IP configuration readout	Service button pressed <2 sec.
2	○	●	○	ON	Initiation of service mode	Service button pressed >2 sec. <4 sec.
3	○	○	●	ON	Factory default reset	Service button pressed >4 sec.

LED display on the LAN jack

LED	Color	Status	Meaning
LAN	Green	Blinking	Data traffic on the Ethernet bus
LINK	Yellow	ON	Physical network connection available



4 Putting the device into operation

4.1 Operating requirements

4.1.1 Receiver's definable IP address

To enable a TAINY LMOD-S1 to actively make a connection to the TAINY SwitchingCenter /ModemServer or to the TAINY ComPortServer, these devices must have a defined address. The following options are available:

Fixed IP address The receiver, e.g. the Internet access of the TAINY SwitchingCenter, has been allocated a fixed IP address by the Internet service provider (this service can be ordered from some Internet service providers).
Or the TAINY SwitchingCenter is available via the LAN/Intranet, which has been allocated a fixed IP address by the network administrator.
(An IP address is made up of 4 numbers with a maximum of three digits each, separated by a dot, e.g.: 255.122.201.005)

Host name, e.g. by DynamicDNS supplier The receiver, e.g. the TAINY SwitchingCenter, can be addressed through a host name in URL format (URL - Uniform Resource Locator). This host name is permanently allocated to the Internet connection of the computer concerned, e.g. by a DynamicDNS supplier (DNS = Domain Name Server). (Also see *DynamicDNS*, page 67).
In this case, the Internet service provider can allocate a dynamic, i.e. changing, IP address to the Internet connection of the receiver, e.g. the TAINY SwitchingCenter.

4.1.2 Access to the Intranet or Internet

Intranet In order to establish a connection via the Intranet/LAN, the TAINY LMOD-S1 is connected to the network via its LAN jack (10 Base-T) via an Ethernet cable.

Internet If you want the TAINY LMOD-S1 to establish a connection via the Internet, this can be done using a DSL connection to the Internet, for example. In this case, a router is connected between the DSL modem and the TAINY LMOD-S1. The data required for Internet access (address, user name, password) are entered into the configuration of the router.
In this case, the IP address of the DSL router has to be entered on the standard gateway in the TAINY LMOD-S1. (LAN tab, Standard gateway).
Also see *The LAN interface (10Base-T)*, page 13.

IP address, dynamic allocation – Yes/No Having an IP address allocated dynamically does not present a problem. The TAINY LMOD-S1 regularly issues watchdog data packages to let the receiver know at which IP address it is currently available.

4.2 Preparing the configuration

The TAINY LMOD-S1 has to be configured before it can be put into operation. You can use either the LAN or the COM interface to configure the device. The settings you make will depend on which interface you select for configuration.

4.2.1 Configuration via LAN (local or via the network)

a. Configuration via the LAN interface: local

- Requirements**
- The TAINY LMOD-S1 has a fixed IP address and a subnet mask.
The default setting for the IP address is: 192.168.1.100, and for the subnet mask: 255.255.255.0
 - The PC you use to perform the configuration must be set to the same subnet mask but have a different IP address (example: TAINY LMOD-S1 IP address: 192.168.100 and PC IP address: 192.168.101,).
- Connect the PC with the TAINY LMOD-S1 LAN interface via a crossover network cable (STP).
- **The TAINY xMOD ConfigCenter** configuration program must be installed on the PC.
 - Click **Service mode via LAN** parameter on the **Properties** tab and enter the TAINY LMOD-S1 IP address. You also have to enter the user name and password that the TAINY LMOD-S1 requests for service access. The default setting for both is: **service**.

Connecting and starting the device

How to connect the device Use a crossover network cable (STP) to connect the service PC with the TAINY LMOD-S1 LAN interface.
Connect the TAINY LMOD-S1 with the power supply.
(Please also refer to the information provided in the sections on *Connections and LEDs* and *Technical Data*.)

Switching on The device will start as soon as it is supplied with electricity.

Now install the configuration software as described in the section on *How to install the configuration software* on page 29.

b. Configuration via the LAN interface: network

- Requirements**
- The TAINY LMOD-S1 has a fixed IP address and a subnet mask.
The default setting for the IP address is: 192.168.1.100, and for the subnet mask: 255.255.255.0
 - The network configuration must allow you to reach the IP address indicated above.
 - The TAINY LMOD-S1 has to be connected to the network.
 - The PC you use to configure the device has to
 - be in the same sub-network as the TAINY LMOD-S1 (initial configuration) and
 - be set to the same subnet mask, but have a different IP address (e.g. 192.168.1.101) (initial configuration),
 - be able to reach the sub-network in which the TAINY LMOD-S1 is located (further configurations).
 - The **TAINY xMOD ConfigCenter** configuration program must be installed on the PC.
 - Click **Service mode via LAN** parameter on the **Properties** tab and enter the TAINY LMOD-S1 IP address. You also have to enter the user name and password that the TAINY LMOD-S1 requests for service access. The default setting for both is: **service**.

Connecting and starting the device

How to connect the device Connect the TAINY LMOD-S1 with the network and the power supply and with the application, if necessary. (Please refer to the information provided in the sections on *Connections and LEDs* and *Technical Data*.)

Switching on The device will start as soon as it is supplied with electricity.

Now install the configuration software as described in the section on *How to install the configuration software* on page 29.

4.2.2 Configuration via COM (local)

Requirements

- The PC you use to configure the device must be connected to the TAINY LMOD-S1 COM interface with a V.24 cable.
- The service PC must have
 - a modem driver for the TAINY LMOD-S1 interface,
 - a dial-up networking connection so that the PC can use its driver to communicate with the TAINY LMOD-S1 via its COM interface, and
 - the **TAINY xMOD ConfigCenter** configuration program installed.
- Click **Service mode via COM** parameter on the **Properties** tab and select the dial-up networking connection. You also have to enter the user name and password that the TAINY LMOD-S1 requests for service access. The default setting for both is: **service**.

Connecting and starting the device

How to connect the device Connect the service PC to the TAINY LMOD-S1 COM interface via a V.24 cable.
Connect the TAINY LMOD-S1 to the power supply. (Please refer to information provided in the sections on *Connections and LEDs* and *Technical Data*.)

Switching on The device will start as soon as it is supplied with electricity.

Installing the modem driver and setting up of the dial-up networking connection

How to install the driver and set up the dial-up networking connection

under
Windows 2000
Windows XP

To do this proceed as follows:

1. Insert the CD which has been supplied with the device into the CD-ROM or DVD drive of the service PC. When the CD has started, click on **Prepare configuration via COM**.

2. If the CD does not start automatically:
 - 1st Click on Start, Run...,
 - 2nd Click on the **Browse** button, select the drive in which you inserted the CD.
 - 3rd Double click on the program name **install.exe**.
 - 4th When the CD has started, click on **Prepare configuration via COM**.

What happens:

The installation program will be executed.

The driver used to connect to the TAINY LMOD-S1 in service mode is installed on the PC, and

a dial-up networking connection is created so that the PC can communicate with the TAINY LMOD-S1 via the installed driver.

During the installation process, Windows installation routines will be called up. These prompt you for some information. The process and the dialogs displayed may vary slightly depending on which version of Windows you are using.

The following instructions show dialogs that are displayed when the installation process is performed on a computer running the Windows XP® operating system.

Follow the instructions on the screen and the instructions below in this manual.

If you are using a different version of Windows (2000), please proceed accordingly.

Install the driver to connect to the TAINY LMOD-S1 in service mode

You must be logged on under Windows XP and Windows 2000 as an **administrator**. Please also make sure that no other modem drivers are installed for the interface selected.

If the PC is installed in a network, make sure that you have the necessary access rights.

1. When the installation program `install.exe` is started, the following dialog appears:



Click on **OK**.

What happens: The *Telephone and modem options* dialog appears.

2. In the *Telephone and modem options* dialog, switch to the *Modems* tab and click on the **Add...** button there. What happens: The *Hardware Wizard* will start.

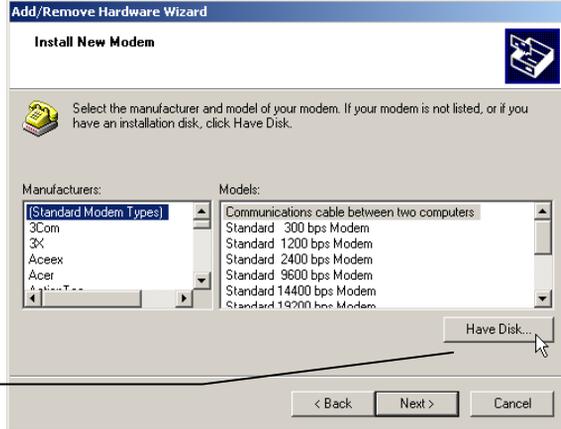


1. Activate **Don't detect my modem; I will select it from a list**.

2. Click on **Next >**.

Driver installation

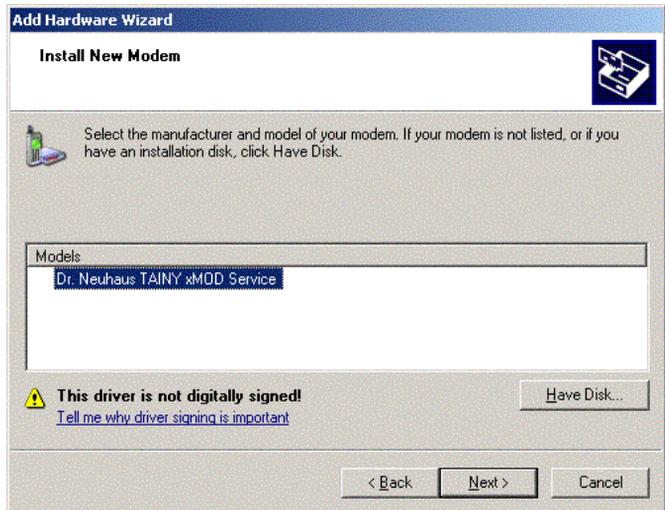
4. The next dialog allows you to install a driver manually:



Click on **Have Disk...**

Click on the **Have disk...** button.

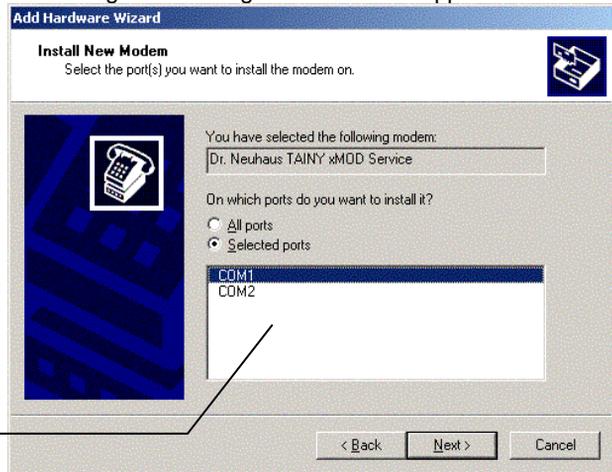
5. In the dialog which follows:
 1. Click on **Browse...**
 2. Switch to the *Drivers* folder on the inserted CD to install the driver file **TAINY_xMODService.INF** from there.
6. The following dialog appears:



Select **Dr. Neuhaus TAINY xMOD Service**.
Then click on **Next >**

Driver installation

7. The dialog for selecting the connection appears:



Select the COM port

1. Select the COM port to which you have connected the cable to the service interface of the TAINY LMOD-S1.
2. Click on **Next >**

8. When the following dialog box appears.



Click on **Continue Anyway**.

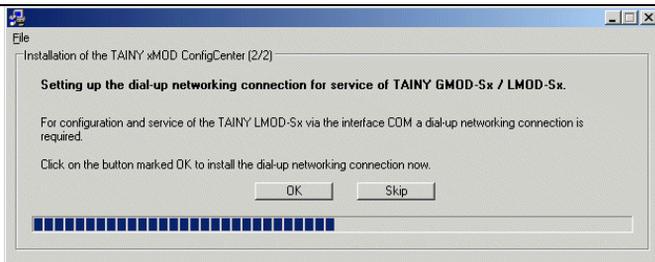
What happens:

The driver is added to the list of installed modems.

Click on **Finish**.

The modem driver is then ready to operate. Close the dialog box and continue.

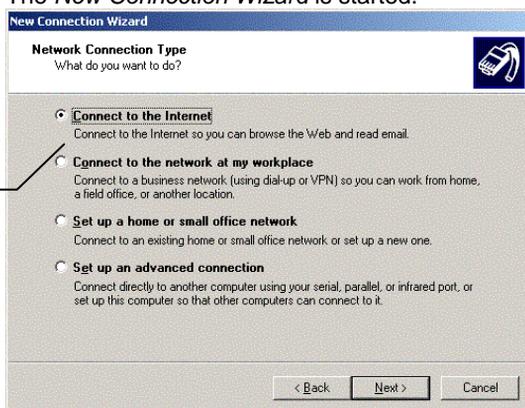
Create the dial-up networking connection



Click on **OK** to create the necessary dial-up networking connection in which the connection data will be stored.

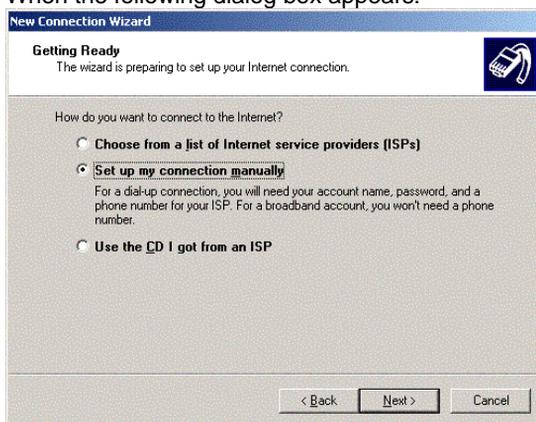
1. The *New Connection Wizard* is started.

Select **Connect to the internet**



1. Select the option **Connect to the Internet**.
2. Click on **Next >**

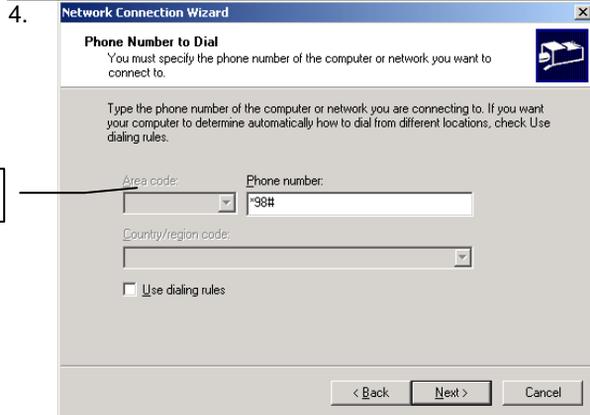
2. When the following dialog box appears:



Choose “Set up my connection manually” and click on **Next**.

Creating the dial-up networking connection

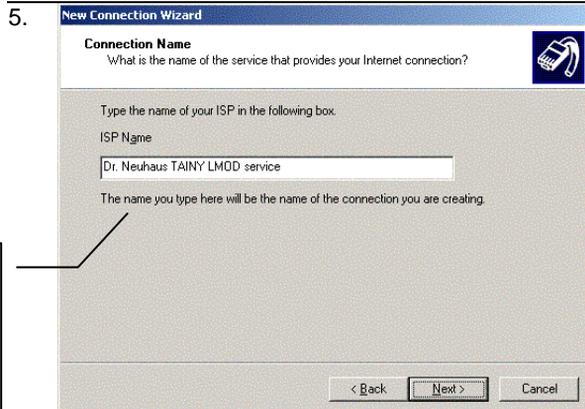
3. You may be asked to select the desired device (modem).
 1. In the list of modems, select **Dr. Neuhaus TAINY xMOD Service**.
 2. Click on **Next >**.



***98#**

Enter the following number: ***98#**
 (=asterisk, 98, hash symbol)
 Then click on **Next >**.

☞ If you are using the Windows 2000 operating system, remove the check mark in front of *Use area code and dialing parameters!*

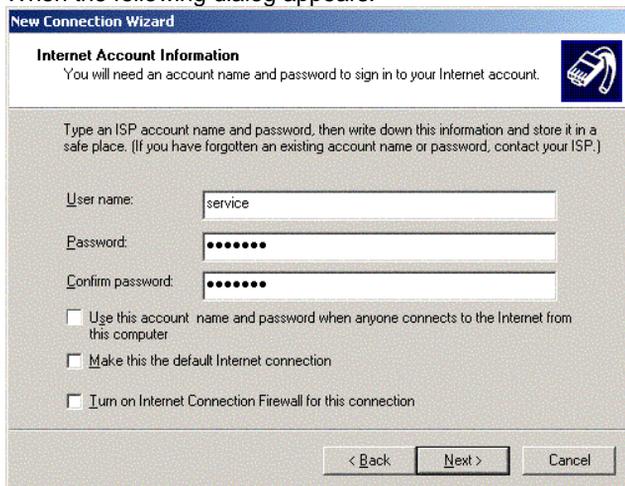


Enter a name for the connection, e.g.:
Dr. Neuhaus TAINY XMOD Service

Enter a name for the connection, e.g.: **Dr. Neuhaus TAINY XMOD Service**
 Click on **Next >**.

Creating the dial-up networking connection

6. When the following dialog appears:



1. The user name and password are required for each connection setup. Entries in this dialog box are stored in the dial-up networking connection properties and do not have to be entered manually for each connection setup. (Factory default for both the user name and the password, is: **service**).

2. Select the appropriate settings.

7. Click on **Next >** and then on **Finish** to end the process of creating the dial-up networking connection.

The dial-up networking connection to service the TAINY LMOD-S1 has now been created.

The connection is now listed in the *Network Connections* dialog.

Close the dialog and continue to install the **TAINY ConfigCenter** configuration software as described in the section on *How to install the configuration software* on page 29.

4.3 How to install the configuration software

Under
Windows 2000
Windows XP

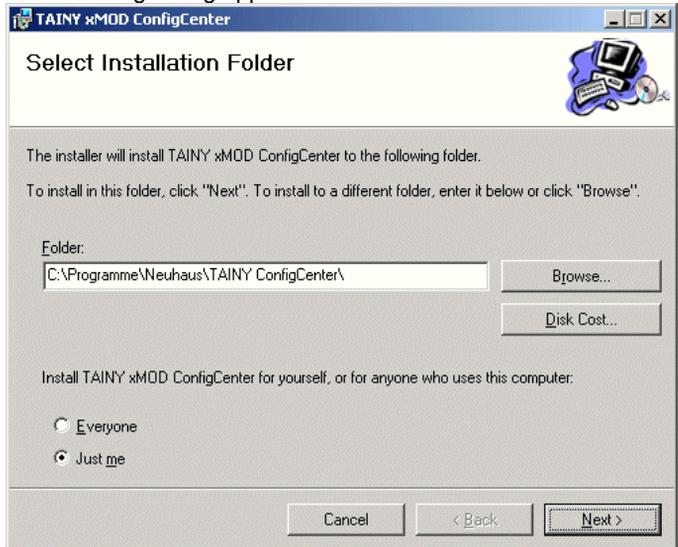
Proceed as follow:

1. Insert the CD that comes with the device into the CD ROM or DVD drive in your service PC. Once the CD has started, click on **Install configuration software**.
2. If the CD does not start automatically:
 - 1st Click Start, Run...,
 - 2nd Then click on **Browse** and select the drive in which the CD is located.
 - 3rd Double click on the following program name: **install.exe**.
 - 4th Once the CD has started, click on **Install configuration software**.

What happens:

The TAINY xMOD ConfigCenter configuration program will be installed on the PC.

3. The following dialog appears:



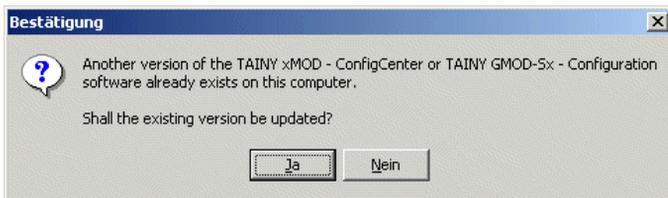
Enter the desired information and click **Next >**.

4. Click **Next >** to confirm the installation of the configuration software.

Then click **Finish** in the last dialog to end the installation process.

Updating existing configuration software

If configuration software for the TAINY GMOD-Sx or the TAINY LMOD-S1 is already installed on your computer, you will see the following message:



Click **Yes** if you want to update the configuration software. The existing version will be uninstalled first. Then the installation of the new software will begin automatically as described above. Click **No** if you do not want to update the existing version. The installation process will be canceled.

5 How to Configure the TAINY LMOD-S1

What to do

During the configuration process, you will be required to select or enter different configuration data. To make sure that you have everything you need for the configuration, proceed as follows:

- 1st First, collect and note down the configuration data. Use the configuration table (from page 33).
 - 2nd Use the TAINY LMOD-S1Config configuration program to help you with the configuration:
 - Retrieve the parameter settings from the device.
 - Perform the configuration.
 - Load the parameter settings into the device.
-

5.1 Read parameters from TAINY LMOD-S1

Load the para.ini parameter file from the TAINY LMOD-S1 into the configuration software.

Requirements

The service PC is connected with the TAINY LMOD-S1 and the device has started as described in the sections on *Configuration via LAN (local or via the network)* or *Configuration via COM (local)*.

The **TAINY ConfigCenter** configuration software is installed on the service PC (see *How to install the configuration software*).

If the service PC accesses the TAINY LMOD-S1 via the COM interface, it will also be necessary to install

- the drivers for the service interface and
 - the dial-up networking connection to the service interface.
-

Read parameters from device

Proceed as follows:

If the service PC accesses the TAINY LMOD-S1 via the LAN interface:

1. Run the *TAINY LMOD-S1Config* configuration program on the service PC. Start it as follows, providing that these were the settings you chose when you installed the program:

Start menu, Programs, Neuhaus, TAINY ConfigCenter ▶ , TAINY LMOD-Sx Config

2. On the **Properties** tab:

- Enter the **user name** and the **password**:
User name (default setting): service
Password (default setting): service
- Select **Service mode via LAN** and enter the **IP address** for the TAINY LMOD-S1. The default IP address is set to 192.168.1.100.

3. In the **Parameters** menu, click **Read parameters from LMOD-Sx**.

The parameter settings will be transferred from the device to the interface.

If the service PC accesses the TAINY LMOD-S1 via the COM interface:

1. Run the *TAINY LMOD-S1 Config* configuration program on the service PC. Start as follows, providing that these were the settings you chose when you installed the program:

Start menu, Programs, Neuhaus, TAINY ConfigCenter ▶ , TAINY LMOD-Sx Config

2. On the **Properties** tab:

- Enter the **user name** and the **password**:
User name (default setting): service
Password (default setting): service
- Click **Service mode via COM** and select the **data interchange connection** to the TAINY LMOD-S1 service interface.

-
3. Press the service button (min. 2 sec., less than 4 sec.) to switch the TAINY LMOD-S1 into the service mode.
-

4. In the **Parameters** menu, click **Read parameters from LMOD-Sx**.

The parameter settings will be transferred from the device to the interface.

5. Once the data has been transmitted, terminate the service mode by pressing the service button (min. 2 sec., less than 4 sec.) to switch the device back into the application mode.
-

5.2 Configuration table

On the following pages, you will find the individual configuration tabs (tabs) on which the configuration program indicates the setting options, i.e. the configuration parameters. In the table below that, you will find the individual parameters and a corresponding explanation as well as additional space in which you can make a note of the configuration data required for your application.

When you write down this information, be sure to write it down correctly.

In the left column of the configuration table, you will find the section and the name under which the corresponding parameter can be found internally in the *para.ini* file. The section names appear in square brackets, e.g.: [IP_CONFIG]

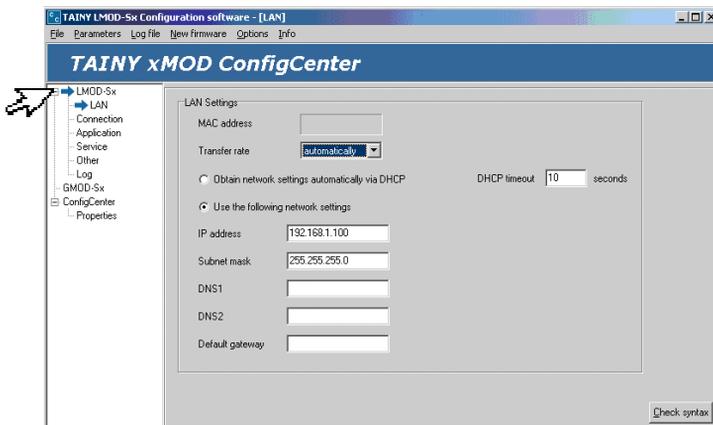
How to start the configuration program

Start the configuration program as follows - providing that these were the settings you chose when you installed the program:

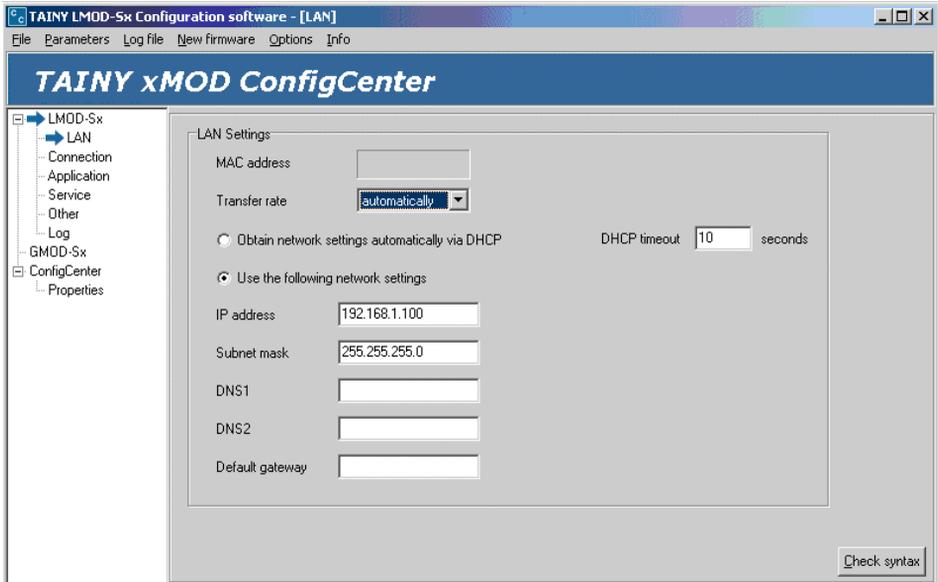
Start menu, Programs, Neuhaus, TAINY ConfigCenter ▶ , TAINY LMOD-Sx Config

Once the configuration program has started, you can still switch from one TAINY product to the other. To do so, simply double click the corresponding product name (GMOD-Sx or LMOD-Sx).

⚠ Important: Any settings that you have made on the interface, but have not saved or transferred to the device, will be deleted if you switch to another product.



Before you proceed, first fill out the following configuration table in this manual and then use the configuration program to complete your configuration.



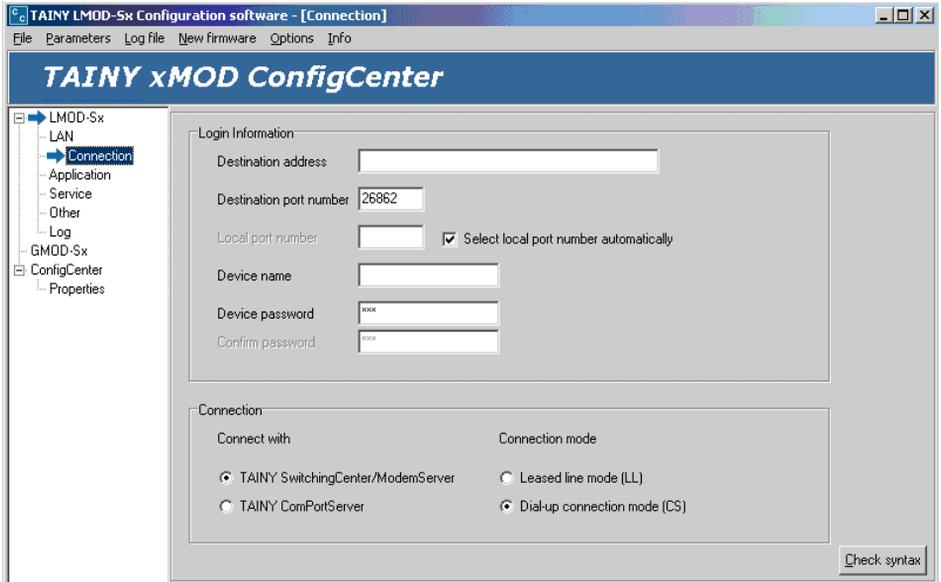
LAN tab

LAN interface data – the interface via which the TAINY LMOD-S1 is connected to the TCP/IP network.

Parameter	Explanation, setting options
[LAN] ETHO_MAC	Display only. Cannot be altered.
[LAN] SPEED	Transmission rate: (Pre-set: automatic) Speed of the LAN interface in megabits per second. Depending on the presetting, the speed will be automatically adjusted to the transmission rate in the LAN connected. Permissible values for the transmission rate: 0, 10 (0 = automatic, 10 = 10MB)
[LAN] DHCP (YES or NO)	<input type="checkbox"/> Get network settings automatically from DHCP (DHCP=YES) If a DHCP server (DHCP = Dynamic Host Configuration Protocol) is active in the LAN connected, you can select this setting. If you do, the TAINY LMOD-S1 will automatically retrieve the following parameters from the DHCP server: - Local IP address - Subnet mask

Parameter	Explanation, setting options
	<p>- DNS1 - DNS2 - Standard gateway</p> <p>A DHCP server can be available in the following cases:</p> <ul style="list-style-type: none"> • The TAINY LMOD-S1 is connected to a router in which a DHCP server is active. • The TAINY LMOD-S1 is connected to the LAN/Intranet via a switch/hub, whereby the IP address allocation, etc., is performed by a DHCP server. The DHC server functions can be performed by a router or by a computer. <p>If there is no DHCP server active, the parameters indicated in the above will have to be configured manually – see below.</p> <p><input type="checkbox"/> Configure the network settings manually (DHCP=NO)</p> <p>You have to select this option if the TAINY LMOD-S1 network settings were <u>not</u> retrieved from a DHCP server – see above. In this case, determine or choose the values for the following parameters and enter this information into the corresponding text boxes:</p> <ul style="list-style-type: none"> - Local IP address - Subnet mask - DNS1 - DNS2 - Standard gateway
<p>[LAN] DHCP_TIME</p>	<p>DHCP timeout: (Default setting: 10)</p> <p>Indicates the time (in seconds) that the TAINY LMOD-S1 waits to send a new DHCP query to the DHCP server.</p> <p>Permissible values: 0 to 999999</p> <p> Does not have to be indicated unless you have selected <i>Automatically retrieve network settings through DHCP</i> – see above.</p>

Parameter	Explanation, setting options
[LAN] LOCALIP	Own IP address: (Default setting: 192.168.1.100) Local IP address for the TAINY LMOD-S1. Must be indicated if no DHCP server is active.
[LAN] SUBNET	Subnet mask:..... (Default setting: 255.255.255.0) Indicates the size of the (sub)network in which the device is operated. Must be indicated when there is no DHCP server active.
[LAN] DNS1 DNS2	DNS1:..... DNS2:..... IP addresses of the DNS servers (Domain Name System servers). These are servers that translate the host names. This information only has to be entered <ul style="list-style-type: none"> • when there is no DHCP server active AND • when a host name is entered in URL format as the <i>destination address</i> on the Connection tab (page 37) instead of an IP address.
[LAN] GATEWAY	Standard gateway: IP address of the device that allows the crossover to other networks, e.g. to the Internet. Data packets that are to be sent to IP addresses that are not in the local subnet are sent to the gateway. This might be a router that provides access to the Internet. Must be indicated when there is no DHCP server active.



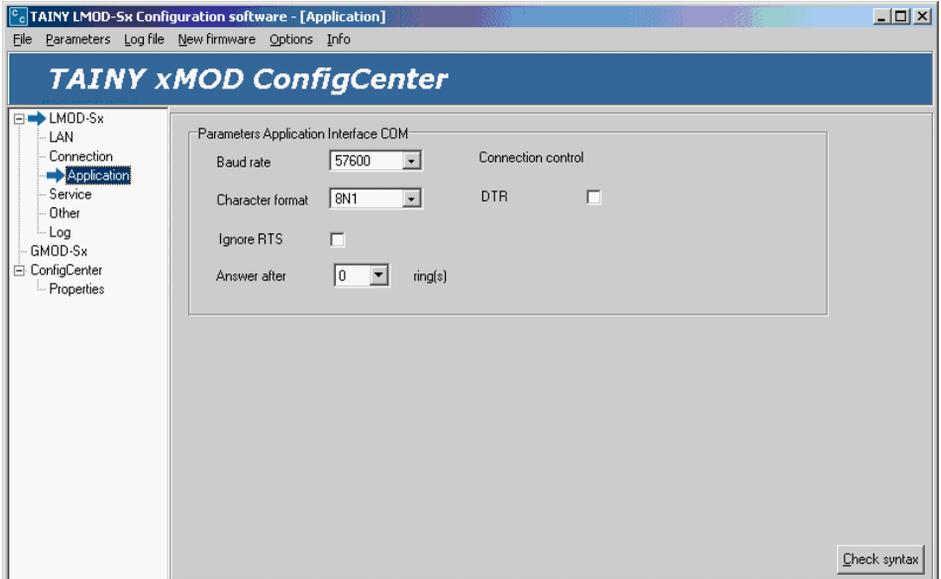
Connection tab This is where you enter the data for the receiver with which the TAINY LMOD-S1 is directly connected: the TAINY SwitchingCenter/ModemServer OR the TAINY ComPortServer.

Parameter	Explanation, setting options
	<p>For the following tasks, please refer to the following sections in this manual:</p> <ul style="list-style-type: none"> - <i>Connection Routes</i>, page 7. - <i>Operating requirements</i>, page 18.
<p>[IP_CONFIG] IP</p>	<p>Destination address.....</p> <p>Enter the address of the server with which the TAINY LMOD-S1 links the application connected: As IP address or as host name in URL format. (If you use the host name, you have to enter the Domain Name Server under DNS on the LAN tab configuration tab (page 34).</p> <p>The server is either the</p> <ul style="list-style-type: none"> • TAINY SwitchingCenter / TAINY ModemServer <p>OR the</p> <ul style="list-style-type: none"> • TAINY ComPortServer

Parameter	Explanation, setting options
[IP_CONFIG] DESTPORT	<p>Destination port number.....</p> <p>Default setting: 26862. The port specified here must correspond to the one via which the server communicates – the TAINY SwitchingCenter or the TAINY ComPortServer. The port used by the server is set ex factory to 26862. Do not enter another port number unless you know that the server is set to this port number for communication with the TAINY LMOD-S1.</p> <p>Make sure to select a port number higher than 20000. Also see RFC 1700. (RFC (= Request For Comments), 1700 (=assigned numbers) denotes a numbered series of documents on Internet standards.</p> <p>Max. value: 65535</p>
[IP_CONFIG] SOURCEPORT	<p>Local port number:.....</p> <p>(Default setting: Assign local port number automatically or RANDOM) Indicates the port the TAINY LMOD-S1 uses to communicate.</p> <p>This port number shouldn't really be changed unless the server settings require that you do so. This might be the case if the server firewall only allows specific ports for communication .</p> <p>Max. value: 65535</p> <p>If you enter a port number, be sure to select one higher than 20000 to avoid using a number already taken by another application.</p>
[SERVER] USER	<p>Device name:.....</p> <p>The TAINY LMOD-S1 uses its device name and password (see below) to identify itself to the server.</p> <p>The MAC address is entered as the default device name. Do not enter another device name here unless the server requests one (max. 30 characters, all letters and digits, no spaces, no special characters).</p>

Parameter	Explanation, setting options
[SERVER] PASSWORD	<p>Password:.....</p> <p>Default setting: PW0</p> <p>The TAINY LMOD-S1 uses its device name (see above) and password to identify itself to the server.</p> <p>Do not enter a different password here unless the server requests one (max. 30 characters, all letters and digits, no spaces, no special characters).</p>
[SERVER] MODE=TSC MODE=CPS	<p>Connection</p> <p>Connect with:</p> <ul style="list-style-type: none"> <input type="radio"/> TAINY SwitchingCenter/ModemServer <p>OR</p> <ul style="list-style-type: none"> <input type="radio"/> TAINY ComPortServer <p>Indicate which server type this TAINY LMOD-S1 will connect with as a client:</p> <p style="padding-left: 40px;">TAINY SwitchingCenter/ModemServer (=TSC)</p> <p style="text-align: center;">OR</p> <p style="padding-left: 40px;">TAINY ComPortServer (=CPS).</p> <p>Also see <i>Connection Routes</i>, page 7.</p>
LINE=LL	<p>If you want the TAINY LMOD-S1 to connect with the TAINY SwitchingCenter/ModemServer, you must also specify the connection mode.</p> <p>Connection mode</p> <ul style="list-style-type: none"> <input type="radio"/> Leased line mode (LL) <p>If the application connected does not control the TAINY LMOD-S1 at all or if it uses the DTR hardware control signal to do so, select this connection mode. It is supported by all three server types: the TAINY SwitchingCenter, the TAINY ModemServer and the TAINY ComPortServer.</p>
LINE=CS	<ul style="list-style-type: none"> <input type="radio"/> Dial-up connection mode (CS) <p>If the TAINY LMOD-S1 is controlled by AT commands issued by the application connected (like a conventional modem), select this connection mode. It is supported by the TAINY SwitchingCenter/TAINY ModemServer only.</p> <p>In this mode, the device establishes a physical connection to the TAINY SwitchingCenter/TAINY ModemServer as soon as it is supplied with the operating voltage. The logical</p>

Parameter	Explanation, setting options
	<p>connection, however, is not established until the TAINY LMOD-S1 receives an AT dial command. The device will terminate the logical connection either after a timeout or after crossing over to the AT mode (after receiving “+++”) as soon as it receives the ATH command. The physical connection is not affected.</p>

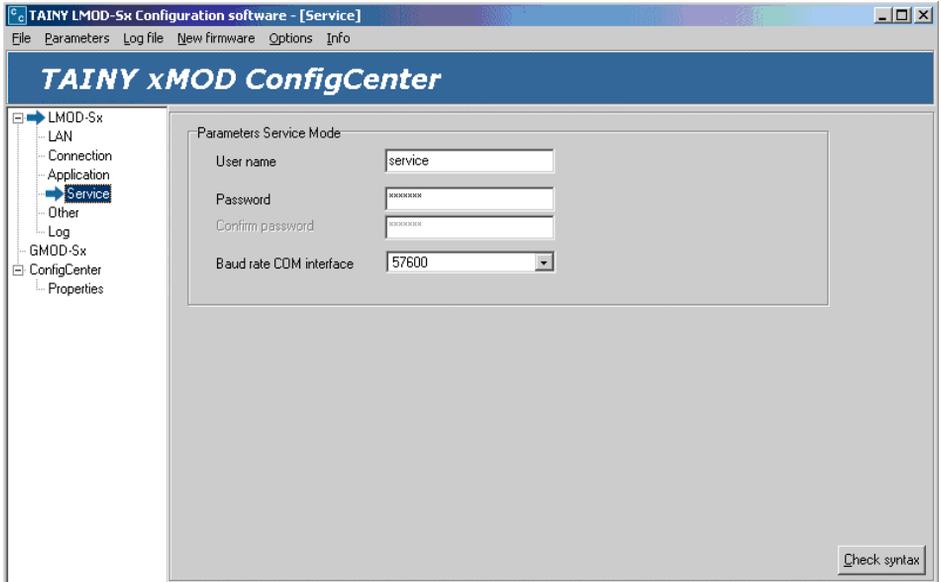


Application tab This is where you indicate how the TAINY LMOD-S1 communicates with the application connected to its COM interface.

Parameter	Explanation, setting options
[COM] BAUDRATE	Baud rate:..... (Default setting: 57600) This defines the speed at which the TAINY LMOD-S1 communicates with the application (e.g. machine, sensor, device) connected to its COM interface. Permissible values: 300, 1200, 2400, 4800, 9600, 19200, 38400 and 57600. Use the selection list to change the value. ⤿ The value set here must be the speed the connected application uses to communicate.
[COM] FORMAT	Character format:..... Default setting: 8N1 (= 8 data bits, non parity, 1 stop bit) Determines the character format the TAINY LMOD-S1 uses to communicate with the application connected to its COM port. Permissible values: 7N1, 8E1, 7E1, 8O1, 7O1, 8N2, 7N2, 8E2, 7E2, 8O2, 7O2, 8N1 Use the selection list to change the value.

Parameter	Explanation, setting options
[COM] CONTROL=DTR, or CONTROL=ALWAYS_ON	<p>☞ The character format specified here must be the same as the one used by the application connected.</p>
	<p>Connection control <input type="checkbox"/> DTR</p> <p>This parameter indicates whether and how the TAINY LMOD-S1 is controlled by the application connected to establish or maintain the connection to the server.</p> <p>DTR (Data Terminal Ready) is a control signal, which is generated by the terminal connected and indicates that it is ready for operation, i.e. that it is ready for data transmission.</p> <p>Control for connection in the dial-up connection mode (CS)</p> <ul style="list-style-type: none"> • If the TAINY LMOD-S1 is operated in the dial-up connection mode (CS) (Connection tab under <i>Connect with the TAINY SwitchingCenter/ModemServer</i> in the dial-up connection mode (CS)), the control of the TAINY LMOD-S1 is automatically set to AT, i.e. the TAINY LMOD-S1 reacts to the AT commands it receives from the application connected. <p>If Connection control with DTR is activated, DTR ON: The TAINY LMOD-S1 executes a dial-up command (e.g. ATD123) to establish the logical connection to another terminal device. DTR OFF: The TAINY LMOD-S1 terminates the logical connection.</p> <p>If Connection control with DTR is not activated, the signal will not affect the logical connections.</p> <p>Control for connection in the leased line mode (LL) With DTR, the TAINY LMOD-S1 will only establish or terminate a connection to the receiver under the following conditions: the TAINY LMOD-S1 receives a DTR signal from the application connected to its COM interface.</p> <p>DTR (Data Terminal Ready) is a control signal, which is generated by the terminal connected and indicates that it is ready for operation, i.e. that it is ready for data transmission. It operates as follows:</p> <p>DTR ON: Establish connection DTR OFF: Terminate connection</p> <p>If DTR is not selected, the TAINY LMOD-S1 will establish a</p>

Parameter	Explanation, setting options
[COM] IGNORE_RTS (YES or NO)	<p>permanent connection to the server as soon as it is switched on or rebooted, regardless of the status of the COM interface, i.e. regardless of whether it receives DTR or AT control signals from the application connected to the interface. This setting is known as “Always On”.</p> <hr/> <p><input type="checkbox"/> Ignore RTS</p> <p>If one of the devices “can’t keep up” with a data transmission, it can send an RTS signal to communicate this problem to the other device involved. The other device can then temporarily interrupt the data flow to prevent a data overflow and any data loss.</p> <p>The TAINY LMOD-S1 is configured so that this type of flow control, also known as a <i>hardware handshake</i>, is completely activated, i.e.:</p> <p>the default setting for <i>Ignore RTS</i>: NO</p>
[COM] ANSWER_RING	<p>Answer after rings</p> <p>This parameter determines whether – and if so – after how many rings the TAINY LMOD-S1 answers incoming “calls” (auto answer).</p> <p>Permissible values: 0, 1, 2, ... 10 Default setting: 0 (= no auto answer)</p> <ul style="list-style-type: none"> ➤ This parameter is not active unless the TAINY LMOD-S1 is set to dial-up connection mode (CS) (see the Connection tab, page 37: under <i>Connect to the TAINY SwitchingCenter/ModemServer Connection mode Dial-up connection mode (CS)</i>). In Leased line mode (LL), the incoming calls for the COM interface are always answered automatically. ➤ If <i>DTR</i> is selected for <i>Connection control</i> (see Application tab, page 41) , the DTR signal has to be active. ➤ Instead of activating auto answer (<i>Answer after.... rings</i>), incoming calls can also be selected as follows: The application connected to the TAINY LMOD-S1 COM interface issues an ATA modem command - see modem commands in the section on <i>Supported Modem Commands, Responses</i>, page 65. This requires that the TAINY LMOD-S1 be set to Dial-up connection mode (CS) – see page 37.

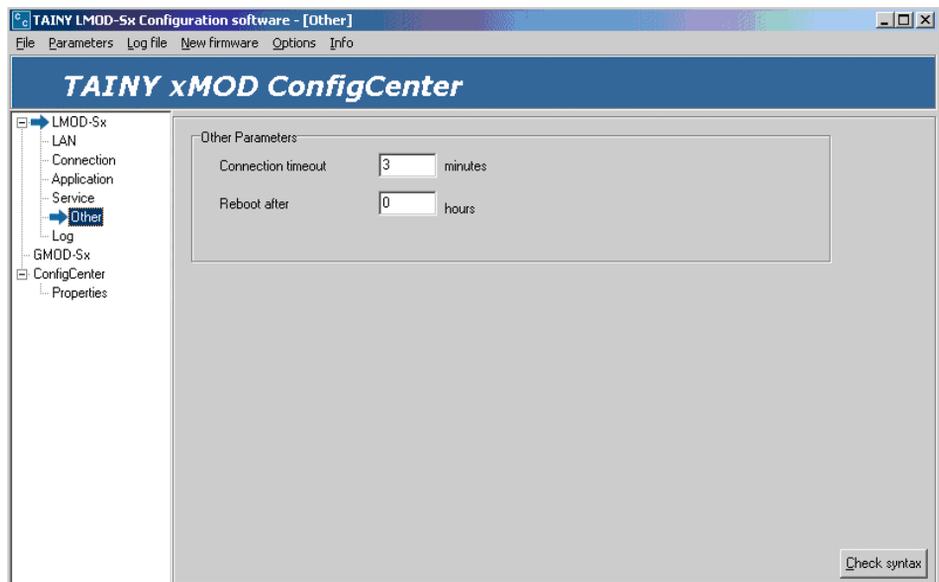


Service tab

Data for the service mode, as well as the user name and password that the TAINY LMOD-S1 requests from the computer used for service access to the TAINY LMOD-S1.

Parameter	Explanation, setting options
[SERVICE_IF] USER PASSWORD	<p>Parameters for the service mode</p> <p>User name.....</p> <p>Default setting: service</p> <p>Password.....</p> <p>Default setting: service</p> <p>(Each with a max. of 30 characters, all letters and digits, no spaces, no special characters)</p> <p>Once the configuration program has retrieved the current parameter settings for the TAINY LMOD-S1 (Parameters menu, Read parameters from LMOD-S1), the currently valid user name will appear in the <i>User name</i> text box and the currently valid password in the <i>Password</i> text box to allow service access. The TAINY LMOD-S1 requests this user name and this password from the service PC connected to it when the service PC dials into the TAINY LMOD-S1 to retrieve or store parameters. The user name and the password are both set to "service" as the default setting.</p> <p>If you change the user name and/or password indicated here,</p>

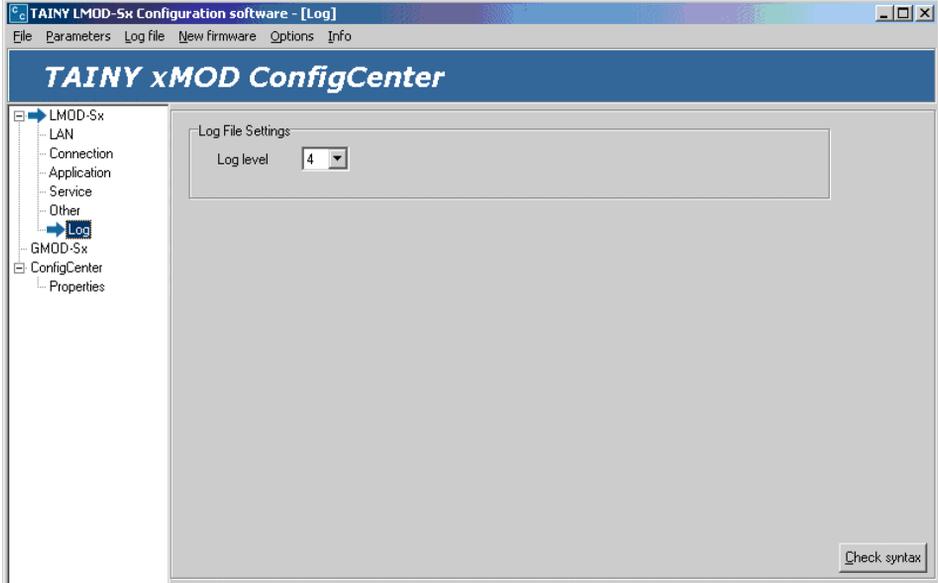
Parameter	Explanation, setting options
[SERVICE_IF] BAUDRATE	<p>the new user name and/or password will be passed on to the TAINY LMOD-S1 by the configuration program the next time any parameters are stored (Parameters menu, Store parameters). The new user name and/or password will not be valid until the TAINY LMOD-S1 is rebooted and they will be requested from the service PC connected the next time it dials in.</p> <p>➡ If you change the user name and the password, make absolutely sure that, after a new user name/password has become valid for the TAINY LMOD-S1, this change is also made in the service PC. You will find step-by-step instructions on how to change the user name and the password in the section on <i>Changing the user name and/or password of the TAINY LMOD-S1 for service access</i>, page 56.</p> <hr/> <p>Baud rate of the COM interface</p> <p>(Default setting: 57600) This determines the speed at which the TAINY LMOD-S1 communicates with the service PC connected to the COM interface.</p> <p>(The character format is permanently set to 8N1.)</p> <p>Permissible values for the baud rate: 9600, 19200, 38400 and 57600</p>



Other tab Specify any other connection parameters, if desired.

Parameter	Explanation, setting options
[LAN] RECONNECT_TIME	<p>Reconnect time:.....</p> <p>Default setting: 3. If it is not possible to establish a connection to the server, the TAINY LMOD-S1 waits for the time indicated here (in minutes) before making another attempt to connect. If a 0 is entered here, the TAINY LMOD-S1 will make no further attempts to connect.</p> <p>Permissible values: 0 to 999999</p> <p>Connection attempts will be made repeatedly in the following cases:</p> <ul style="list-style-type: none"> - The server IP address or port number entered is incorrect. - A host name is configured as the address for the server, but this name cannot be translated by the DNS server because no DNS server can be reached or because it cannot deliver a valid IP address. - Authentication on the server was acknowledged with an error (wrong device name (= USER), wrong password, account already used).

Parameter	Explanation, setting options
[GENERAL] REBOOT_TIME	<p>Reboot after:.....hours</p> <p>Permissible values: 0, 1, ..., 99999</p> <p>(Default setting: 0) If 24 is entered here, for example, the TAINY LMOD-S1 will be automatically rebooted every 24 hours and will register again in the network. If the value is set to 0 (= default setting), the system will not be rebooted automatically.</p> <p>If the device is located in a place that is difficult to access, we recommend setting this parameter to a value > 0 so that the device is rebooted on a regular basis.</p>

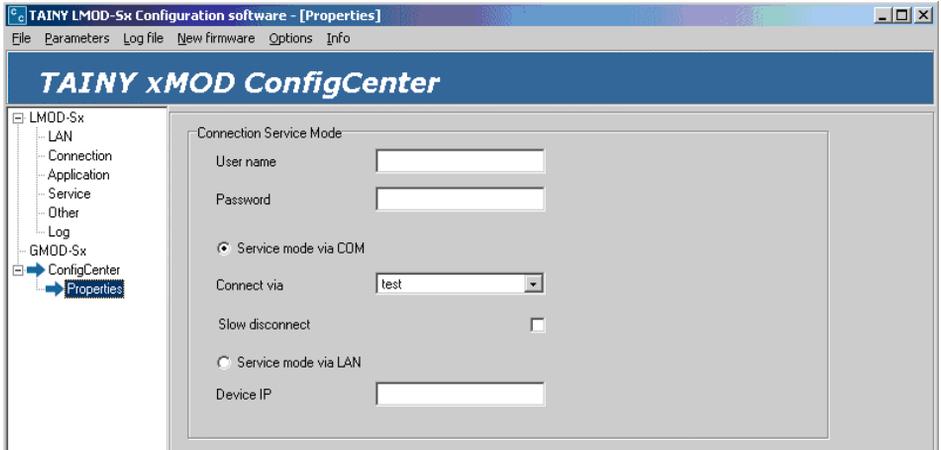


Log tab

This is where you specify the properties of the log file.

Parameter	Explanation, setting options
[GENERAL] LOG_FILE_FILTER	<p>Log level:.....</p> <p>(Default setting: 3; permissible: 0, 1, 2, 3, 4, 5, 6)</p> <p>Select a value from the selection list to specify how deep the messages stored in the log file go.</p> <p>If you enter 0, only those messages with the highest priority will be written into the log file.</p> <p>Definition of the priority levels:</p> <ul style="list-style-type: none"> 0 SYSTEM: Messages about reboots 1 FATAL: Errors that block operation; the system will reboot after 10 minutes. 2 SEVERE: Errors that occur because the resources requested are not available at that time; the system continues to operate. 3 WARNING: Events generated by a warning message, e.g. when the default settings are reset. 4 INFO: Events generated by an info message. These are messages about the system status. 5 DEBUG: Events generated by a debug message. These contain the same information as the INFO messages. They provide more information about the operation of

Parameter	Explanation, setting options
	the system in terms of time. 6 SPAM: n/a. 7 PROD: n/a.



Properties tab

Determines whether the TAINY LMOD-S1 is to be configured via its COM or its LAN interface. Other information on the service mode.

Parameter	Explanation, setting options
<p>No parameter settings in the para.ini</p>	<p>User name:..... (Default setting: service)</p> <p>Password:..... (Default setting: service)</p> <p>Permissible characters for user name and password:</p> <ul style="list-style-type: none"> • max. 30 characters, no spaces, no special characters <p>The TAINY LMOD-S1 requests the user name and/or password indicated here from the service PC the next time it accesses the TAINY LMOD-S1. Thus, the user name and/or password indicated here are not transferred to the TAINY LMOD-S1, but rather apply for the setting of the service PC or the TAINY xMOD ConfigCenter configuration program. They have to be the same as the service access data that is valid for the TAINY LMOD-S1 on the Service tab, page 44.</p> <ul style="list-style-type: none"> ☞ If you have changed the user name and/or password for service access to the TAINY LMOD-S1 on the Service tab (see Service tab, page 44), this data also has to be changed afterwards in the service PC. The next time the service PC is used for service access to the TAINY LMOD-S1, the TAINY LMOD-S1 will require the new data from the service PC.

Parameter	Explanation, setting options
No parameter settings in the para.ini	<p>You will find step-by-step instructions on how to change the user name and the password in the section on <i>Changing the user name and/or password of the TAINY LMOD-S1 for service access</i>, page 56.</p>
	<p><input checked="" type="radio"/> Service mode via COM</p> <p><input checked="" type="radio"/> The service mode for the TAINY LMOD-S1 (configuration) can be operated either</p> <ul style="list-style-type: none"> - via the COM interface OR - via the LAN interface of the TAINY LMOD-S1. <p>If the <i>Service mode via COM</i> option has been activated, the dial-up networking connection via which the service PC accesses the TAINY LMOD-S1 must be entered/selected in the Connection text box.</p> <p>Connection via:</p> <p>Indicates the dial-up networking connection the service PC uses to communicate with the TAINY LMOD-S1 if the service computer is connected to the TAINY LMOD-S1 via the COM interface.</p> <p>This dial-up networking connection is set up when the installation program is executed – see <i>Configuration via COM (local)</i>, page 21.</p>
	<p><input type="checkbox"/> Slow disconnect</p> <p>If you have used a corresponding adapter and driver to connect the service PC via its USB interface to the COM interface of the TAINY LMOD-S1, this could create problems in establishing connections in rare cases. If this happens, activate this option.</p> <ul style="list-style-type: none"> <input checked="" type="radio"/> Has no effect unless <i>Service mode via COM</i> has been activated.

Parameter	Explanation, setting options
No parameter settings in the para.ini	<p data-bbox="290 178 552 205"> <input type="radio"/> Service mode via LAN </p> <p data-bbox="290 236 1000 406"> <input checked="" type="radio"/> The service mode for the TAINY LMOD-S1 (configuration) can be operated either <ul style="list-style-type: none"> <li data-bbox="342 296 590 323">- via the COM interface <li data-bbox="342 326 380 352">OR <li data-bbox="342 355 579 406">- via the LAN interface of the TAINY LMOD-S1. </p> <p data-bbox="290 409 1005 467"> <input checked="" type="radio"/> The service mode via the LAN interface can be used only under the following conditions: <ul style="list-style-type: none"> <li data-bbox="325 479 1000 561">– The service PC is located in the same subnet as the TAINY LMOD-S1 (initial configuration) or is able to reach the subnet in which the TAINY LMOD-S1 is located. <li data-bbox="325 570 994 680">– You know the TAINY LMOD-S1 IP address because you configured it manually or it was permanently assigned in the DHCP server – see the LAN tab tab, page 34, <i>Own IP address</i>. </p> <hr/> <p data-bbox="290 738 980 820"> If the <i>Service mode via LAN</i> option has been activated, the TAINY LMOD-S1 IP address must be entered in the following text box: </p> <p data-bbox="290 851 877 878"> Device IP address: </p> <p data-bbox="290 906 978 964"> This address must be the same as the one entered in the <i>Own IP address</i> text box on the LAN tab tab, page 34. </p>

5.3 Store parameter settings into device

You can store the settings you made in the configuration program directly into the TAINY LMOD-S1.

Requirements The PC on which the configuration program runs has to be able to access to the TAINY LMOD-S1, either via the TAINY LMOD-S1 COM or LAN interface.
For more information, please refer to the section on *Configuration via LAN (local or via the network)*, page 19 and *Configuration via COM (local)*, page 21.

Storing parameters

Proceed as follows:

If the service PC accesses the TAINY LMOD-S1 via the LAN interface:

1. On the **Properties** tab, enter the user name and password and select **Service mode via LAN** and enter the TAINY LMOD-S1 IP address.
-

2. **Parameters** menu, click **Store parameters to LMOD-Sx**.

The settings will be transferred to the device and the device will reboot.

If the service PC accesses the TAINY LMOD-S1 via the COM interface:

1. On the **Properties** tab, enter the user name and password and select **Service mode via COM** and enter the dial-up networking connection to the service interface.
-

2. Press the service button (min. 2 sec., less than 4 sec.) to switch the TAINY LMOD-S1 into the service mode.
-

3. In the **Parameters** menu, click **Set parameters**.

The settings will be transferred to the device and the device will reboot.

5.4 Storing the parameter settings in and reading them from a file

You can also store the settings for the TAINY LMOD-S1 in a file on the service PC. You can then access the stored settings if you want to set the same parameters for another TAINY LMOD-S1.

Requirements The TAINY LMOD-Sx Config configuration program is installed on the PC you are using.

This PC must have access to the TAINY LMOD-S1, either via the TAINY LMOD-S1 COM or the LAN interface.

For more information, please refer to the section on *Configuration via LAN (local or via the network)*, page 19, and *Configuration via COM (local)*, page 21.

Storing the settings in a file

Proceed as follows:

1. Run the *TAINY LMOD-S1 Config* configuration program.
2. Use the tabs to specify the applicable parameters, referring to the notes you made in the parameter table – starting on page 33.

OR

Read out the current settings from the TAINY LMOD-S1 connected: **Parameters** menu, click **Read parameters from LMOD-Sx**.

If the service PC uses the COM interface to access the TAINY LMOD-S1:

- you have to press the service button (min. 2 sec., less than 4 sec.) to switch the TAINY LMOD-S1 into service mode,
- and enter the user name and password, click **Service mode via COM** and select the dial-up networking connection to the service interface on the **Properties** tab.

If the service PC uses the LAN interface to access the TAINY LMOD-S1:

- and enter the user name and password, click **Service mode via LAN** and enter the IP address of the TAINY LMOD-S1 on the **Properties** tab.

-
3. In the **Parameters** menu, click **Store parameters to file**. Define the file name and the folder.
-

Reading settings from a file and loading them into the TAINY LMOD-S1

Proceed as follows:

1. Run the *TAINY LMOD-S1Config* configuration program.

Important: Do not click the **Read parameters from LMOD-Sx** entry!

In the **Parameters** menu, click **Read parameters from a file**.

Select the corresponding file.

What happens:

The TAINY LMOD-S1Config configuration program will display the parameter settings read out from the file.

2. Change the settings displayed if necessary.
-

3. If the service PC uses the COM interface to access the TAINY LMOD-S1:

- you have to press the service button (min. 2 sec., less than 4 sec.) to switch the TAINY LMOD-S1 into service mode,
- and enter the user name and password, click **Service mode via COM** and select the dial-up networking connection to the service interface on the **Properties** tab.

If the service PC uses the LAN interface to access the TAINY LMOD-S1:

- and enter the user name and password, click **Service mode via LAN** and enter the IP address of the TAINY LMOD-S1 on the **Properties** tab.
-

4. In the **Parameters** menu, click **Store parameters to LMOD-Sx**.

What happens:

The configuration program will transfer the settings to the TAINY LMOD-S1.

5. Now press the service button on the TAINY LMOD-S1 again (min. 2 sec., less than 4 sec.) to switch the device back into the applications mode.

- ➡ If you have used the LAN interface to access the TAINY LMOD-S1, this step will not be necessary.
-

5.5 Changing the user name and/or password of the TAINY LMOD-S1 for service access

Requirements The TAINY LMOD-Sx Config configuration program is installed on the PC you are using.
This PC must have access to the TAINY LMOD-S1, either via the TAINY LMOD-S1 COM or the LAN interface.
For more information, please refer to the section on *Configuration via LAN (local or via the network)*, page 19, and *Configuration via COM (local)*, page 21.

What to do Proceed as follows:
If the service PC uses the COM interface to access the TAINY LMOD-S1:

First change user name and/or password in the TAINY LMOD-S1, then in the service PC!

1. Press the service button on the TAINY LMOD-S1 for at least 2 seconds and less than 4 seconds long to switch the device into service mode.
Run the TAINY LMOD-S1 Config configuration program.
2. Enter the user name and password, click **Service mode via COM** and select the dial-up networking connection to the service interface on the **Properties** tab.
3. In the **Parameters** menu, click **Read parameters from LMOD-Sx**.
What happens:
The configuration program loads the para.ini parameter file out of the TAINY LMOD-S1 onto the PC and displays the parameters that are currently valid.
4. Enter the new user name/password on the **Service** tab in the configuration program, see page 44.
5. In the **Parameters** menu, click **Store parameters to LMOD-Sx** to transfer the changed user name and/or password to the TAINY LMOD-S1.
6. Press the service button on the TAINY LMOD-S1 again (min. 2 sec., less than 4 sec.) to switch the device back into application mode.

7. Enter the following information on the **Properties** tab of the configuration program (page 50):
 1. If service access uses the COM interface of the TAINY LMOD-S1: First use the *Connection via* selection list to select the dial-up networking connection you want to use for service access to the TAINY LMOD-S1.
 2. Enter the registration data (user name/password) in the *User name* and/or *Password* text box that will now be required for service access.
(If you selected an dial-up networking connection in the last step, the new user name and/or password will be stored in the dial-up networking connection of the Windows Control Panel.)

Result: The service computer will indicate the new user name and/or password required for service access the next time it connects with the TAINY LMOD-S1.
 8. Now press the service button on the TAINY LMOD-S1 for at least 2 seconds and less than 4 seconds to switch the device back into application mode.
-

If the service PC uses the LAN interface to access the TAINY LMOD-S1:

1. Run the *TAINY LMOD-S1 Config* configuration program on the service PC. Start it as follows – providing that these were the settings you chose when you installed the program:
Start menu, Programs, Neuhaus, TAINY ConfigCenter ▶ , TAINY LMOD-Sx Config
 2. Enter the user name and/or password, click **Service mode via LAN** and enter the TAINY LMOD-S1 IP address on the **Properties** tab.
 3. In the **Parameters** menu, click **Read parameters from LMOD-Sx**.
What happens:
The configuration program loads the para.ini parameter file out of the TAINY LMOD-S1 onto the PC and displays the parameters that are currently valid.
 4. Enter the new user name/password on the **Service** tab in the configuration program, see page 44.
 5. In the **Parameters** menu, click **Store parameters to LMOD-Sx** to transfer the changed user name and/or password to the TAINY LMOD-S1.
-

6. Enter the following information on the **Properties** tab of the configuration program (page 50):

Enter the registration data (user name/password) in the *User name* and/or *Password* text box that will now be required for service access.

5.6 For experienced users

The TAINY LMOD-S1 stores its configuration in a text file with the name para.ini. It is possible to download this file from the device, edit it and upload it again instead of using the configuration program to configure the device.

- Requirements**
- The PC on which the configuration program runs has to be able to access to the TAINY LMOD-S1, either via the TAINY LMOD-S1 COM or LAN interface.
For more information, please refer to the section on *Configuration via LAN (local or via the network)*, page 19 and *Configuration via COM (local)*, page 21.
- An FTP program is installed on the PC (can be downloaded as freeware from the Internet). This FTP program must be set to active mode to access the TAINY LMOD-S1.
-

What to do

Proceed as follows:

1. The service PC is connected locally with the TAINY LMOD-S1 via the COM interface:

Press the service button on the TAINY LMOD-S1 (min. 2 sec., less than 4 sec.) to switch the device into service mode.

- If you use the LAN interface to configure the TAINY LMOD-S1, this step will not be necessary.
-

2. Establishing the FTP connection to the TAINY LMOD-S1:

If the service PC uses the TAINY LMOD-S1 COM interface:

Establish the dial-up networking connection to the TAINY LMOD-S1. Based on this, use an FTP program to establish the connection to the TAINY LMOD-S1 – see below under Connection data.

If the service PC uses the TAINY LMOD-S1 LAN interface:

Use an FTP program to establish the connection to the TAINY LMOD-S1.

Connection data:

FTP address: 192.168.1.100 (providing that the TAINY LMOD-S1 default setting has not been changed)

User name (factory default setting): service

Password (factory default setting): service

3. Download the para.ini file.
-

4. Use a text editor to edit the para.ini file – any text editor for simple ASCII text like the Windows Editor (is included in the Windows accessories).

5. If the service PC uses the TAINY LMOD-S1 COM interface:

Make sure that the TAINY LMOD-S1 is in the service mode. Use the FTP program to establish the connection to the TAINY LMOD-S1 and upload the para.ini file back into the TAINY LMOD-S1.

Press the service button on the TAINY LMOD-S1 again for at least 2 seconds and less than 4 seconds to switch the device back into application mode.

- If the service PC uses the TAINY LMOD-S1 LAN interface:

Use an FTP program to establish the connection to the TAINY LMOD-S1 and upload the para.ini file back into the TAINY LMOD-S1.

6 Log File

The TAINY LMOD-S1 records all the TCP/IP connections in the log file. The old data will not be replaced with new data until the memory capacity of 20 KB has been exhausted. You can view the log file.

Requirements The TAINY LMOD-Sx Config configuration program is installed on the PC you are using.
This PC must have access to the TAINY LMOD-S1, either via the TAINY LMOD-S1 COM or the LAN interface.
For more information, please refer to the section on *Configuration via LAN (local or via the network)*, page 19, and *Configuration via COM (local)*, page 21.

View log file Proceed as follows:

If the service PC uses the TAINY LMOD-S1 COM interface:

1. Press the service button on the TAINY LMOD-S1 (min. 2 sec., less than 4 sec.) to switch the device into the service mode.
2. Run the *TAINY LMOD-S1 Config* configuration program on the service PC. Start it as follows, providing that these were the settings you chose when you installed the program:

Start menu, Programs, Neuhaus, TAINY ConfigCenter ▶ , TAINY LMOD-Sx Config

3. Enter the user name and password, click **Service mode via COM** and select the dial-up networking connection to the service interface on the **Properties** tab.
 4. In the **Log file** menu, click **View log file**.
What happens:
The configuration program will load the log file out of the TAINY LMOD-S1 onto the PC and display the log file.
 5. Press the service button on the TAINY LMOD-S1 again (min. 2 sec., less than 4 sec.) to switch the device back into application mode.
-

If the service PC uses the TAINY LMOD-S1 LAN interface:

1. Run the *TAINY LMOD-S1 Config* configuration program on the service PC. Start it as follows, providing that these were the settings you chose when you installed the program:

Start menu, Programs, Neuhaus, TAINY ConfigCenter ▶ , TAINY LMOD-Sx Config

2. Enter the user name and/or password, click **Service mode via LAN** and enter the TAINY LMOD-S1 IP address on the **Properties** tab.

3. In the **Log file** menu, click **View log file**.

What happens:

The configuration program loads the log file down from the TAINY LMOD-S1 onto the PC and displays the log file.

7 Updating the Firmware

The firmware contains the basic programming of the TAINY LMOD-S1. If the manufacturer creates a new version of the firmware, to add new functions to the device, for example, you can load this new version onto the TAINY LMOD-S1.

Requirements The TAINY LMOD-Sx Config configuration program is installed on the PC you are using.
This PC must have access to the TAINY LMOD-S1, either via the TAINY LMOD-S1 COM or the LAN interface.
For more information, please refer to the section on *Configuration via LAN (local or via the network)*, page 19, and *Configuration via COM (local)*, page 21.

What to do Proceed as follows:
If the service PC uses the TAINY LMOD-S1 COM interface:

1. Press the service button on the TAINY LMOD-S1 (min. 2 sec., less than 4 sec.) to switch the device into the service mode.
2. Run the *TAINY LMOD-S1 Config* configuration program on the service PC. Start it as follows, providing that these were the settings you chose when you installed the program:
Start menu, Programs, Neuhaus, TAINY ConfigCenter ▶ , TAINY LMOD-Sx Config
3. Enter the user name and password, click **Service mode via COM** and select the dial-up networking connection to the service interface on the **Properties** tab.
4. In the **New firmware** menu, click **Import new firmware**.
Select the firmware file stored on your computer to transfer it to the TAINY LMOD-S1.
The transfer and the update itself may take several minutes.
Once the update has been completed, the TAINY LMOD-S1 will reboot.

If the service PC uses the TAINY LMOD-S1 LAN interface:

1. Run the *TAINY LMOD-S1 Config* configuration program on the service PC. Start it as follows, providing that these were the settings you chose when you installed the program:

Start menu, **Programs, Neuhaus, TAINY ConfigCenter ▶ , TAINY LMOD-Sx Config**

2. Enter the user name and/or password, click **Service mode via LAN** and enter the TAINY LMOD-S1 IP address on the **Properties** tab.
-

3. In the **New firmware** menu, click **Import new firmware**.

Select the firmware file stored on your computer to transfer it to the TAINY LMOD-S1.

The transfer and the update itself may take several minutes.

Once the update has been completed, the TAINY LMOD-S1 will reboot.

8 Supported Modem Commands, Responses

The TAINY LMOD-S1 supports the AT commands and responses listed below on the COM interface. The AT interface is only available during the CS operating mode. All AT commands end with the delivery of CR (Carriage Return).

- ➔ The device responds with OK to all other AT commands than the ones listed in the following.

AT commands strings can be used and are processed accordingly.

AT command (to the TAINY LMOD-S1)	Response (from the TAINY LMOD-S1)	Description
ATD<number>	CONNECT/NO CARRIER	Dial-up
ATDT<number>	CONNECT/NO CARRIER	Dial-up
ATDP<number>	CONNECT/NO CARRIER	Dial-up
ATS0=n (0<n<?)	OK	Answered after n-tn rings. 0 means disabled
ATBn (n > 0)	OK	No function
ATLn (n > 0)	OK	No function
ATMn (n > 0)	OK	No function
ATT	OK	No function
ATP	OK	No function
AT&Cn (n > 0)	OK	No function
AT&Dn (n > 0)	OK	No function
AT&Kn (n > 0)	OK	No function
AT&Sn (n > 0)	OK	No function
AT&W AT&Wn (n > 0)	OK	Stores the current device configuration (only ATS0=n is stored)
AT%T	OK	No function
AT&V0	OK	No function
AT&V99	List of all AT commands	No function
AT&An	Error	No function
AT&Vn (n>1)	Error	No function
AT&Yn (n > 0)	OK	No function
AT&Nn (n > 0)	OK	No function
ATQ1		Quiet mode on
ATQ0	OK	Quiet mode of
ATQn (n > 0)	OK	No function
AT&F	OK	Factory settings
+++	OK	Switch to command mode
ATH	OK	Hang up
ATIn (n > 0)	Device and firmware ID and the date are issued	No function
ATO	OK	Switches back to data mode
ATA	CONNECT or NO CARRIER	Call answer
ATE and ATE0	OK	Echo off

AT command (to the TAINY LMOD-S1)	Response (from the TAINY LMOD-S1)	Description
ATE1	OK	Echo on
ATEn (n>1)	Error	No function
ATS=n	OK/Error	Sets/deletes S register
ATS0=n	OK	Answer after n-th rings
ATSx=n (x>0), (n:0,1,2..)	Error	No function
ATV0	OK	Feedback as number (verbose mode on)
ATV1	OK	Feedback as number (Verbose mode off)
ATX	OK	No function
ATZ	OK	Resets the stored S register values
ATI99	Reads out the IP configuration followed by OK (also see page 14)	No further function
AT%PING=<IP> <IP> is the IP address in format (0..255).(0..255).(0..255).(0..255)	Ping Response: - Ping Request Success - Ping Timeout - Ping Error	A PING is sent to a remote host and the device waits for a response.
AT&D0	OK	Ignores the status of the DTR control management of the serial COM interface. (Also see DTR and Always On connection control)
AT&D2	OK	When the DTR line switches (from active to inactive), the modem terminates the existing logical connection to the receiver. DTR behavior is observed in CS and LL mode.
AT&Dn (n > 2)	ERROR	
AT&D1	OK	No function

Responses

Response	Verbose on	Description
OK	0	
CONNECT	1	
RING	2	
NO CARRIER	3	
ERROR	4	
NO DIALTONE	5	
BUSY	7	

9 Glossary

Client/Server	<p>In a client/server environment a server is a program or computer which receives and answers queries from the client program or client computer.</p> <p>In the case of data communication one also uses the term client for the computer which establishes a connection to a server (or host), i.e. the client is the calling computer and the server (or host) is the called computer.</p>
COM port, virtual COM port	<p>The term "COM port" (communications port) is used to describe a serial interface (V.24, RS-232) on a Windows PC. Application programs use COM ports for data transmission to various devices such as modems, PCs, terminals etc. A COM port can have a connector (a physical COM port) or be a software interface in the PC (a virtual COM port). Virtual COM ports behave in the same way for application programs as physical COM ports but the data can be rerouted onto other interfaces.</p>
DynamicDNS providers offer the capability of being accessible via a fixed Internet address	<p>Each computer which is connected to the Internet has an IP address (IP = Internet Protocol) An IP address consists of 4 numbers, separated by full stops, which each have up to three digits. If the computer is online via the telephone line per modem, per ISDN or per ADSL it is assigned a dynamic IP address by the Internet service provider, i.e. the address changes from session to session. Even if the computer is online for 24 hours without interruptions (e.g. with a flat rate) the IP address is changed from time to time.</p> <p>If a local computer is to be accessible via the Internet it must have an address which is known to the remote communication partner. Only in this way can the communication partner establish a connection to the local computer. However, if the address of the local computer continually changes this is not possible, except where the operator of the local computer has an account with a DynamicDNS provider (DNS = Domain Name Server). He can then define a name in URL format (URL = Uniform Resource Locator) with this provider under which the computer shall be accessible in the future, e.g. www.xyz.abc.de. In addition the DynamicDNS provider provides a small program which has to be installed and executed in the computer in question. In each Internet session of the local computer this tool informs the DynamicDNS provider of the computer's current IP address. Its domain name server registers the current assignment of URL IP address and advises this to other domain name servers in the Internet.</p> <p>If a remote computer now wishes to establish a connection to the local computer which is registered with the DynamicDNS provider</p>

the following takes place: The remote computer uses the URL (= host name) of the local computer as the address. This results in a connection being established to the responsible DNS (Domain Name Server) to determine the IP address currently assigned to this URL. The IP address is transferred back to the remote computer which now uses it as the destination address. This now leads to exactly the desired local computer.

This procedure is the basis for all Internet addresses in URL format: First a connection is established to the DNS to determine the IP address assigned to this URL. Once that has happened this "looked-up" IP address is used to establish the connection to the desired communication partner, i.e. to any Internet site.

You can find DynamicDNS providers on the Internet under the following address: <http://netzadmin.org/ddns-provider.php>

IP address

Each host or router on the Internet/Intranet has a unique IP address (IP = Internet Protocol). The IP address is 32 bits (= 4 bytes) long and is written as 4 numbers (each in the region from 0 to 255) separated by dots.

An IP address consists of 2 parts: the network address and the host address.

Network address	Host address
-----------------	--------------

All hosts in a network have the same network address, but different host addresses. Depending on the size of the network concerned - a distinction is made between Class A, B and C networks - the two parts of the address can differ in length:

	1. Byte	2. Byte	3. Byte	4. Byte
Class A	Net address	Host address		
Class B	Net address		Host address	
Class C	Net address			Host address

Whether an IP address denotes a device in a Class A, B or C network can be identified by the first byte in the IP address. The following are fixed values:

	Value of 1 st byte	Bytes for the net address	Bytes for the host address
Class A	1-126	1	3
Class B	128-191	2	2
Class C	192-223	3	1

In terms of figures, there can only be a maximum of 126 Class A

networks in the world, with each of these networks encompassing a maximum of $256 \times 256 \times 256$ hosts (3 bytes address space). Class B networks can occur 64×256 times and can each contain up to 65,536 hosts (2 bytes address space: 256×256). Class C networks can occur $32 \times 256 \times 256$ times and can each contain up to 256 hosts (1 byte address space).

Subnet mask

Normally, a corporate network with access to the Internet is officially assigned only one single IP address, e.g. 134.76.0.0. In this address example it can be seen from the 1st byte that this corporate network is a Class B network, i.e. the last 2 bytes can be used freely for host addresses. In terms of figures, this results in address space for 65,536 possible hosts (256×256). Such a huge network makes little sense. It becomes necessary to form subnets. The *subnet mask* serves this purpose. Like an IP address, this a field 4 bytes long. The value 255 is assigned to each of the bytes representing the network address. This serves mainly to "borrow" a part from the host address area in order to use it to address subnets. In a Class B network, for example, (2 bytes for the network address, 2 bytes for the host address) the 3rd byte, which is normally reserved for the host address, can now be used for subnet addresses by applying the subnet mask 255.255.255.0. In terms of figures, this means that 256 subnets can be created, each with 256 hosts.

PPP (Point to Point Protocol)

Designates a transmission procedure via serial point-to-point connections for data packets, specially for Internet access via a modem.

Protocol, transmission protocol

Devices which communicate with one another must use the same rules for this communication. They must "speak the same language". Such rules and standards are collectively referred to as a protocol or transmission protocol. Often used protocols are, for example, TCP/IP and PPP.

RAS (Remote Access Services) The designation for the Windows programming interface and its functions which the dial-up networking makes available to the application programs. RAS enables application programs which expect a network, e.g. a TCP/IP network, to establish a connection via the TAPI and a modem. The application does not notice at all that the data are not forwarded via a network board but via the telephone network using a modem or another transmission device. In the Windows dial-up networking so-called connections are created. The connection data for each of these connections is stored, for example a definition is made as to which modem is used to establish the connection and which network protocol is available to the application following establishment of the connection.

Service Provider A company or institution which provides users with access to the Internet or an online service.

TCP/IP (Transmission Control Protocol/Internet Protocol) Network protocols which are used for the connection of two computers in the Internet. IP is the basic protocol. UDP is based on IP and sends individual packets. These may arrive at the recipient in a different order to that in which they were sent, or they can even be lost. TCP serves to protect the connection and, for example, ensures that the data packets are forwarded in the correct order to the application. UDP and TCP, in addition to the IP addresses, include port numbers between 1 and 65535, by means of which the different services are distinguished. UDP and TCP form the basis for a number of other protocols, e.g. HTTP (Hyper Text Transfer Protocol), HTTPS (Secure Hyper Text Transfer Protocol), SMTP (Simple Mail Transfer Protocol), POP3 (Post Office Protocol, Version 3), DNS (Domain Name Service). ICMP is based on IP and contains control messages. SMTP is an e-mail protocol based on TCP. IKE is an IPsec protocol based on UDP. ESP is an IPsec protocol based on IP. On a Windows PC the WINSOCK.DLL (or WSOCK32.DLL) takes over the handling of both these protocols.

VPN - Virtual Private Network A **Virtual Private Network (VPN)** connects several separate private networks (subnets) via a public network, e.g. the Internet, to form a shared network. Confidentiality and authenticity are ensured by using cryptographic protocols. A VPN therefore provides an inexpensive alternative to dedicated lines when it comes to setting up a supraregional corporate network.

10 Technical Data

Interface COM	Function	Connection of application or service PC; Data transmission via TAINY SwitchingCenter TAINY ModemServer or CPS; Configuration via FTP server
	Connection control	Always-Online DTR control for connection establishment AT commands for connection establishment
	Connection mode	Dial-up connection, leased line, service mode
	Protocol	Raw data without protocol; PPP for configuration
	Standard	RS-232 (V.24/V.28), socket: SUB-D9
	Speed	300 bit/s up to 57.600 bit/s
Interface LAN	Function	Data transmission via TCP/IP protocol; Configuration via FTP server
	Standard	RJ45, 10Base-T Ethernet
	Speed	10Mbit/s
Voltage supply	Input voltage	12 – 30 VDC (24 VDC nominal)
	Input current	I _{typ.} 120mA@12V , I _{typ.} 60mA@24V
Galvanic isolation	Test voltage	10 BASE-T/supply (1500 V _{eff} , 50Hz, 1 min.)
Ambient conditions	Temperature range	Operating: –20°C to +70°C (>55°C derating) Storage: –25°C to +85°C
	Humidity	0-95 %, non condensing
Mechanics	Construction	Top-hat rail housing
	Material	Synthetic material
	Protection category	IP40
	Dimensions	114 mm x 22,5 mm x 99 mm (L x W x H)
	Weight	Approx. 150g
Approvals	CE	Yes
	EMC directive	89/336/EWG
	EMC/ESD	EN 55024, EN 55022, EN 61000-6-2
	Electrical Safety	EN 60950
Accessories	Power supply unit	Power supply unit (top-hat rail mounting), Input nom.: 100-240VAC
	Miscellaneous	Screw terminal clip adapter: SUBD-9<-> screw terminal clip, serial , crossover network cable, network cable
System requirements	TAINY SwitchingCenter , TAINY ModemServer or TAINY ComPortServer (CPS) or TAINY Connect compatible switching service	

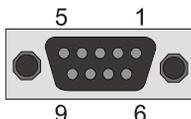
Other	Included in delivery	Device, CD with user manual/modem driver for service mode and configuration software	
	Order number	TAINY LMOD-S1	316503

Interface COM

Pin assignment:

Signals (Signal direction DTE) SUB-D9 socket, Pin assignment RS232

Pin1	DCD	Output
Pin2	RXD	Output
Pin3	TXD	Input
Pin4	DTR	Input
Pin5	GND	Signal ground
Pin6	DSR	Output
Pin7	RTS	Input
Pin8	CTS	Output
Pin9	RI	Output

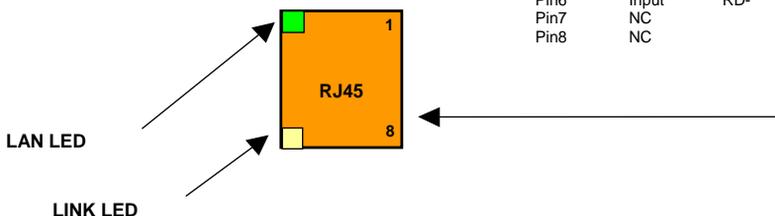


Interface LAN

➡ Use Shielded Twisted Pair (STP) cable for connecting.

RJ45 (Shielded) 10-Base-T

Pin1	Output	TD+
Pin2	Output	TD-
Pin3	Input	RD+
Pin4	NC	
Pin5	NC	
Pin6	Input	RD-
Pin7	NC	
Pin8	NC	



11 Appendix: Connection Routes, Connection Types, Security

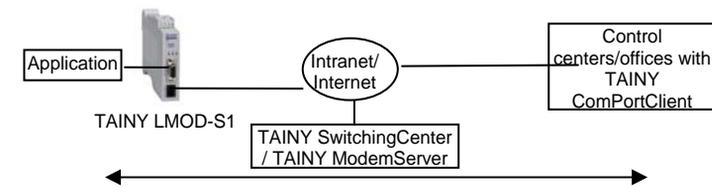
11.1 Connection routes: Overview

The following diagrams indicate connection routes that the TAINY LMOD-S1 can be used to create.

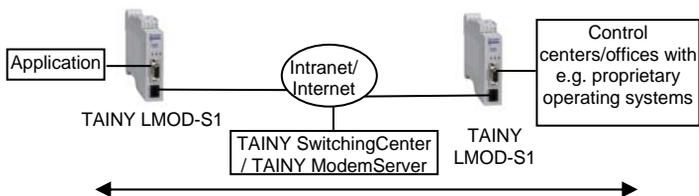
Via the TAINY SwitchingCenter /ModemServer as a switching center

Destination: Control center PC with control center software and the TAINY ComPortClient (CPC)

Application ↔ Control center

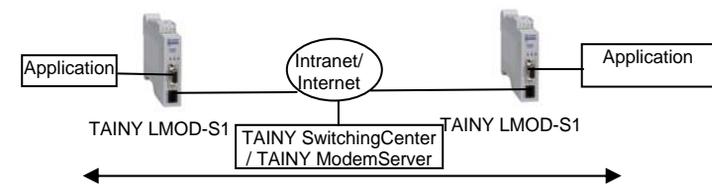


Destination: Control center PC with control center software and an upstream TAINY LMOD-S1



Destination: Application with an upstream TAINY LMOD-S1

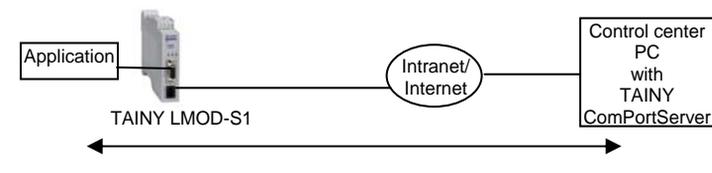
Application ↔ Application



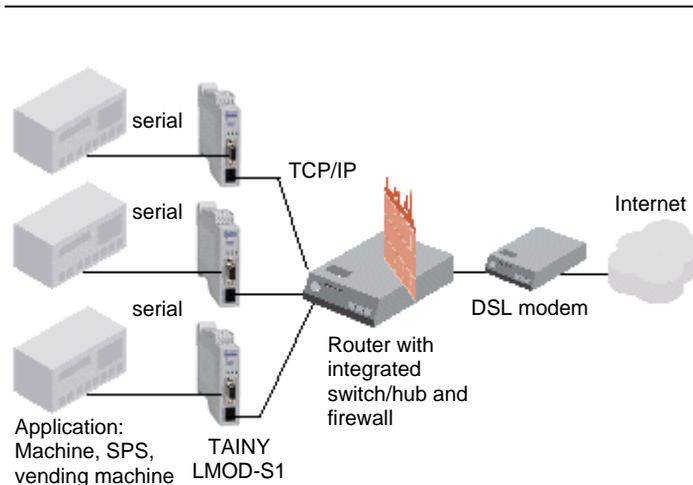
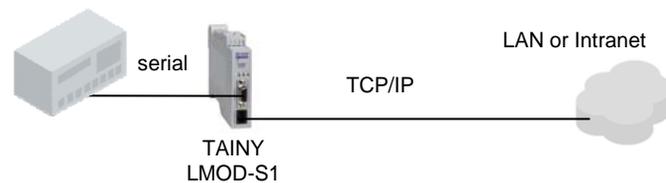
Via the TAINY ComPortServer

Destination: Control center PC with control center software and TAINY ComPortServer (CPS)

Application ↔ Control center



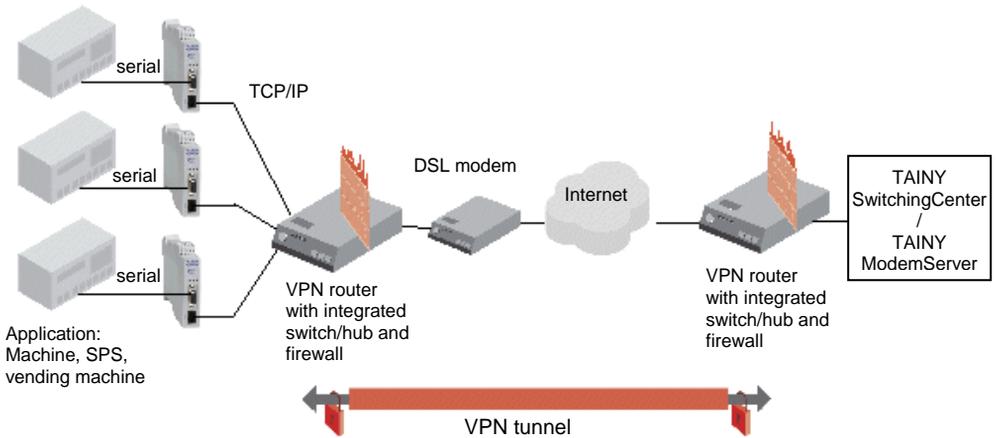
11.2 Connection types



If you want the TAINY LMOD-S1 to establish a connection via the Internet, this can be done, for example, using DSL access to the Internet, by connecting a router between the devices. The access data required for Internet access (IP address for the Internet service provider's Internet connection, user name, password) are entered when the router is configured. If you use a firewall, make sure that the ports you configure for the TAINY LMOD-S1 are also activated in the firewall.

11.3 Security

TCP/IP connections via the Internet link one or more TAINY LMOD-S1 devices on the one side and the receiver (e.g. TAINY SwitchingCenter/ModemServer) on the other. A VPN router equipped with a firewall upstream can provide full protection for the Internet connection.



Example: Device sequence for a VPN tunnel via the Internet

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