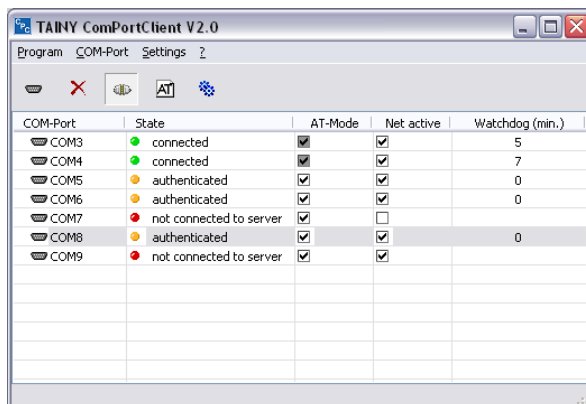


TAINY ComPortClient

User manual



COM-Port	State	AT-Mode	Net active	Watchdog (min.)
COM3	connected	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	5
COM4	connected	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	7
COM5	authenticated	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0
COM6	authenticated	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0
COM7	not connected to server	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
COM8	authenticated	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0
COM9	not connected to server	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	



Dr. Neuhaus



Attention!

Please note, particularly when using pay networks:

Data packets are exchanged when setting up a connection, when receiving a connection and during attempts to connect (e.g. server off, false destination address, etc.). It is thereby irrelevant whether the attempts to connect are successful or unsuccessful. TAINY Connect Clients are generally configured in such a way that they carry out the handling of this connection automatically and independently.

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1 The TAINY Connect System

The **TAINY ComPortClient** is part of the TAINY Connect System, the transmission system for wireless and wired M2M (Machine to Machine) communication on the basis of IP networks.

Consisting of the TAINY Connect terminals, various AT, meter and dedicated line modems for TCP/IP networks, as well as a central "exchange", the TAINY SwitchingCenter or the TAINY ModemServer, this system uses wired and wireless TCP/IP networks for the transmission of data.

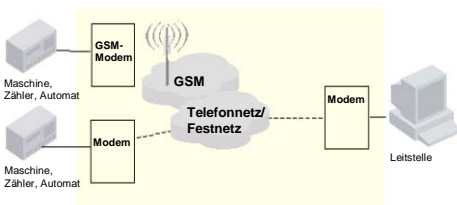
With the TAINY SwitchingCenter / TAINY ModemServer and the TAINY Connect terminals, both hardware and software-based, an individual "TCP/IP private automatic branch exchange" can be set up. Through this, machines, programmable logic controllers (PLC), robots, meters, net control stations and other devices can communicate with one another, with connections throughout the world, wherever access to a TCP/IP network (Internet, intranet or GPRS) is available. The machines, PLC, robots, meters, net control stations, etc. are connected by series interfaces to the TAINY Connect terminals. The TAINY Connect terminals behave like traditional analog or GSM modems on public exchanges or private automatic branch exchanges. The connection is set up in combination with the TAINY

SwitchingCenter / TAINY ModemServer. The TAINY SwitchingCenter or the TAINY ModemServer thereby functions as a switching center, thus enabling mutual data transfer, by dedicated line or switched connection.

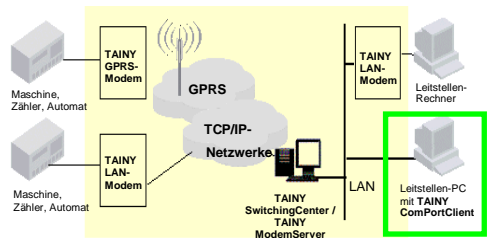
Examples:

Data communication process ↔ net control station

Earlier

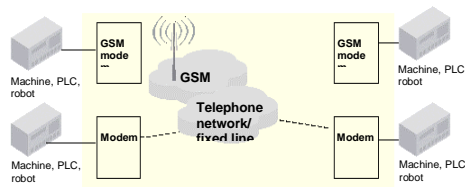


Today

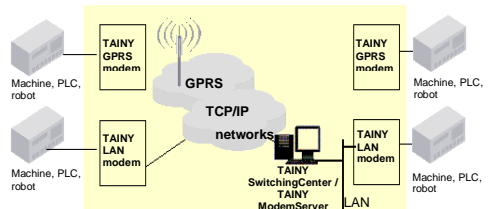


Data communication process ↔ process

Earlier



Today



The TSC protocol The TSC protocol is a protocol designed by Dr. Neuhaus for the exchange of reference data, monitoring and control information between the TAINY SwitchingCenter and the TAINY Connect Clients over TCP/IP-based networks, whether wired (Internet, intranet (LAN)) or wireless (GPRS).

The TSC protocol is currently defined as an independent standard.

1.1 Practical application examples for the TAINY Connect System

- Recording data involving consumption of electricity, water or gas consumption, from vending machines or fill levels
- Remote maintenance
- Transmission of alarm signals
- Fast data transmission for electronic payment
- Monitoring of machines
- Monitoring of vending machines
- Transmission of weather data

1.2 The TAINY ComPortClient

The **TAINY ComPortClient** has the following purpose:

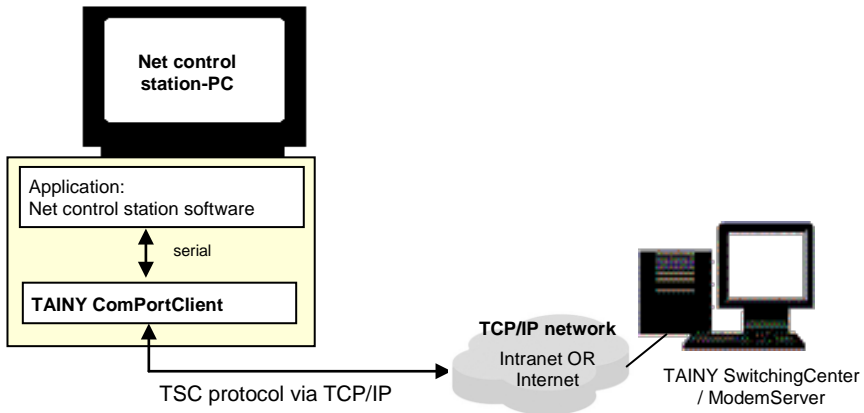
TCP/IP data communication for net control stations that are themselves no longer TCP/IP-capable.

The TAINY ComPortClient is a TAINY Connect Client on a software basis. It adds up to 255 virtual COM ports (CPC COM ports) to a PC. These can be used to set up a serial communication software application, e.g. net control station software, data connections through a TAINY SwitchingCenter/ModemServer to other TAINY Connect Clients. The TAINY ComPortClient implements serial (Modem) communication of the software application in such a way that it is passed on via TCP/IP networks, by dedicated line or switched connection. The TAINY ComPortClient also has the following interfaces:

- internally to the SW application (e.g. net control station software); this software appears as one or more COM ports to the TAINY ComPortClient.

AND

- to the TCP/IP network and the TAINY SwitchingCenter/ModemServer accessible through this, which creates further connections to other TAINY Connect Clients.



A COM port made available by the TAINY ComPortClient, the so-called CPC COM port, thus emulates a real serial interface of the computer for the SW application. However, data received by the SW application is not issued via a hardware interface, but is instead packed into the TSC protocol and sent via the TCP/IP connection to the carrier, the TAINY SwitchingCenter/ModemServer. Received data is there unpacked from the TSC protocol and sent to the SW application as if from a hardware interface. Interface signals such as RTS, CTS, DTR, DSR and DCD are supported. In addition, the CPC COM port also has an AT command interface and can emulate a Hayes-compatible AT modem in the activated AT mode of your SW application.

Switched connection mode CS When the net control station software issues modem commands, the telephone number of another TAINY Connect Client can be transferred together with the ATD command. Following this, the connection to this Tainy Connect Client is created by the TAINY SwitchingCenter / TAINY ModemServer. In this case a switched connection is set up - **CS** (**CS = Circuit Switched**).

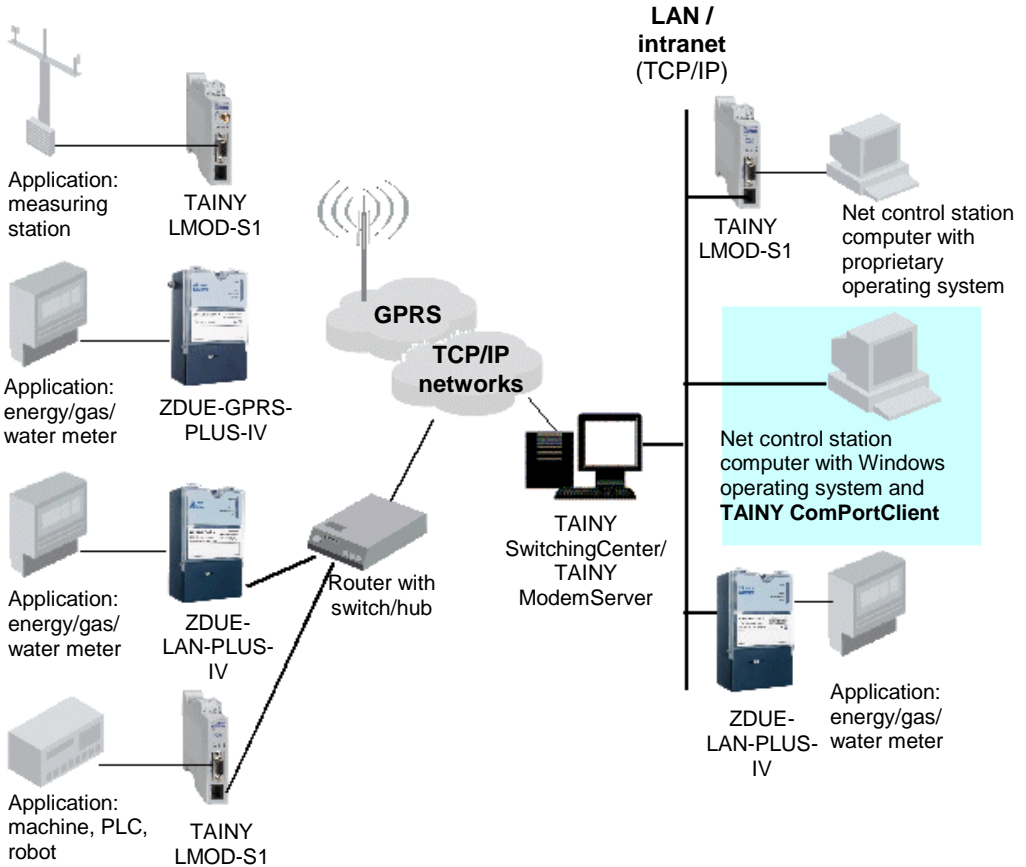
Dedicated line mode LL When no connection control by AT modem commands should or can take place, dedicated lines can instead be set up by the TAINY SwitchingCenter:

- between a CPC COM port of the net control station PC and
 - another TAINY Conect Client.
- (Mode - **LL** (**LL = Leased Line**)).

1.3 Connection routes via TAINY SwitchingCenter / TAINY ModemServer:

The following possibilities for data communication via TCP/IP protocol over the TAINY SwitchingCenter / TAINY ModemServer are available:

Net control station ↔ Application



All connections of the net control station PC pass through a PC with access to the Internet/intranet as a switching center. The TAINY SwitchingCenter / TAINY ModemServer is executed on this PC. These software variants each function practically like a telecommunications private automatic branch exchange, meaning they can be used to create switched connections or dedicated lines between any TAINY Connect Clients. These include, for example, TAINY LMOD-S1, TAINY GMOD-Sx (with wireless connection via GPRS). It is irrelevant whether the TAINY Connect Clients are accessible via GPRS, Internet or intranet.

2 Prerequisites for operation and installation

2.1 Prerequisite for operation: definable IP address of the TAINY SwitchingCenter/ModemServer

In order that the TAINY ComPortClient can actively create a connection to the TAINY SwitchingCenter / ModemServer, this or these must have a defined address. The following options are possible:

Fixed or definable IP address

- in the intranet OR
- in the Internet

The TAINY SwitchingCenter is in the intranet (LAN):
The network administrator will have assigned it a fixed IP address. (An IP address consists of 4 numbers with a maximum of three digits, each separated by a period, e.g.: 255.122.201.005)

The TAINY SwitchingCenter is accessible through the Internet:

There are two possibilities:

- A fixed IP address has been assigned to it by the Internet service provider (Can be requested from several Internet service providers).
- The Internet service provider assigns it the IP address dynamically, meaning that it changes. In this case, a host name in URL format (URL - Uniform Ressource Locator) must be permanently assigned to the Internet connection of the TAINY SwitchingCenter/ModemServer, through which the TAINY SwitchingCenter / the TAINY ModemServer can be addressed. Host names are, for example, permanently assigned by a DynamicDNS provider (DNS = Domain Name Server). (See also *DynamicDNS-providers*, p. 30).

2.2 System prerequisites

Windows PC

Windows 2000 / XP Professional

Server

Windows 2000

Server / Server 2003

In order to install the TAINY ComPortClient onto a PC and to use it successfully, the following prerequisites for the PC must be satisfied:

- PC with Windows 2000 Professional or XP Professional operating system, or on a server with the Windows 2000 Server or Windows Server 2003 operating system
You must have administrator rights in Windows to be able to install a program.
- Installed network interface card
- TCP/IP connection to the TAINY SwitchingCenter / ModemServer, either through the intranet or the Internet.

2.3 Installation

In order to install the TAINY ComPortClient, proceed as follows:

1. Place the supplied program CD into the CD-ROM drive of your computer. After the Wizard for the installation of the CD has started, click the button for the installation of the TAINY ComPortClient.

If the Wizard on the CD fails to start automatically, start it manually:

- Click **Start, Do...**,
- After clicking the **Browse** button, go to the drive with the CD.
- Double click the program name **install.exe**.

After the Wizard has started, click the button for the installation of the TAINY ComPortClient.

2. Follow the instructions on the screen. Adopt the suggested settings or change these.

After completing the installation, the TAINY ComPortClient will start automatically and you will see the main window of the program.

For information on program operation see *The user interface of the TAINY ComPortClient*, page 12.

2.4 Deinstallation

Either via

Start, Programs, Neuhaus, TAINY ComPortClient, Uninstall

OR

via Windows System Control, **Software**.

3 The user interface of the TAINY ComPortClient

3.1 Start / end program, open / hide main window

During the installation of the TAINY ComPortClient, a link to the TAINY ComPortClient was created in the Windows program folder *Autostart*. This means that the TAINY ComPortClient is automatically started each time the PC is started.

Manual start

The TAINY ComPortClient can also be started manually, for example, when the link in the Windows program folder *Autostart* has been deleted:

To do this, click the menu **Start, Programs, Neuhaus, TAINY ComPortClient, TAINY ComPortClient**



Following the start, the TAINY ComPortClient runs as a service in the background. Its user interface is reduced to icon size and is only visible in the *Systray*, also known as the *Information area*, to the lower right in the Windows task bar.

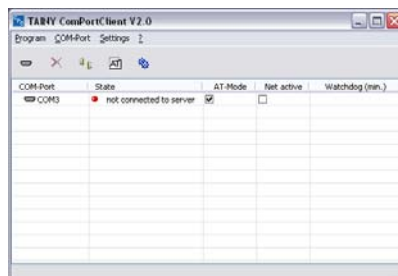
A double click or a right click on the icon opens the context menu.



Show main window

1. With the right mouse button, click on the CPC icon to the lower right of the screen in the *Systray*, also known as *Information area*, in order to open the context menu.
2. Click **Show Main Window** in the context menu.
3. For password protection:
Enter the password in the event that the window is protected by a password. (Factory settings do not provide for password protection.)

Password entry may be required

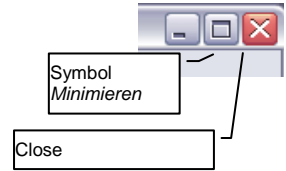


Following installation or the first start, a COM port will be shown. This has been added to the already existing COM ports of the PC - see *Add ports*, page 16.

Hide main window Click **Hide Main Window** in the **Program** menu.

OR

Click on the *Minimize* or *Close* icons to the upper right.



End program **TAINY ComPortClient End:**

1. Click the symbol with the right mouse button to open the context menu.
2. Click **End** in the context menu.

3.2 Operation, language settings, password protection

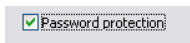
Operation Program operation takes place in the open main window, as for other Windows programs

- by manual command OR
- by clicking icons (Each icon represents a menu command).

Language The language setting of the user interface can be changed:
Settings, Usage; select the desired language in the *Usage settings* dialog.

The changed language setting first takes effect following a restart of the TAINY ComPortClient.

Define / cancel password protection The opening of the main window of the TAINY ComPortClient can be protected with a password.



Define password protection:

1. Menu **Settings, Usage**; activate the "*Password protection*" control field in the *Usage settings* dialog.
2. *Define* the password in the dialog.

Password:.....

Password protection takes effect as soon as you close the main window. This means that as of now the password must be entered each time the main window is opened.

Cancel password protection:



1. Menu **Settings, Usage**; deactivate the "*Password protection*" control field in the *Usage settings* dialog.

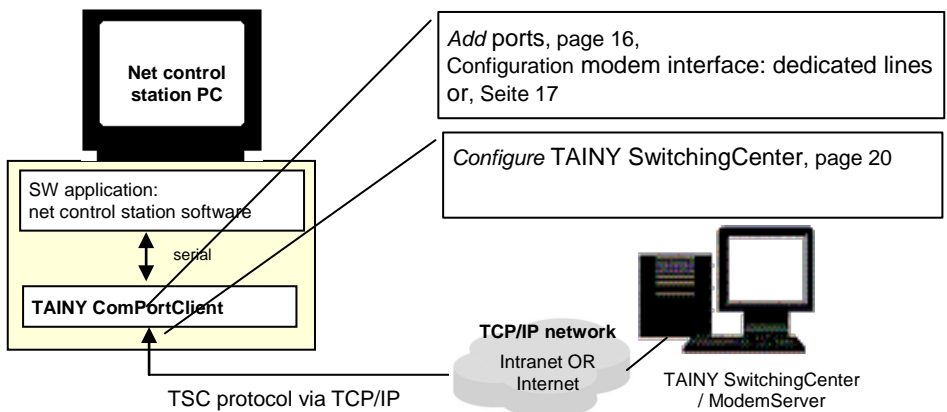
Password protection is deactivated as soon as you close the main window. This means that as of now the password need no longer be entered to open the main window.

4 Configuration of the TAINY ComPortClient

The basic configuration of the TAINY ComPortClient has the following objectives:

Goals

<ul style="list-style-type: none"> • Making available the necessary number of virtual CPC COM ports 	} Page 16
<ul style="list-style-type: none"> • Configuration of the modem interface for switched connection or dedicated line; process eventual responses to AT commands 	} Page 17
<ul style="list-style-type: none"> • Configuration of the TCP/IP connection for the TAINY SwitchingCenter 	} Page 20



Procedure

In order to carry out the configuration, proceed as follows:

1. First collect the configuration data for the TCP/IP connection to the TAINY SwitchingCenter/ModemServer. Note this data in the table of the section in which the parameters to be defined are explained - see *Configure TAINY SwitchingCenter*, page 20.
2. Following the (automatic) start of the program, open the main window using the context menu with a right click on the symbol to the lower right in the *Systray*.
3. Call up the appropriate dialog with a menu command, icon click or key combination in order to enter the parameters there.
4. Now hide the main window, meaning reduce to icon size.

4.1 Add / Remove COM ports

COM ports

Following the installation, the TAINY ComPortClient makes an additional virtual COM port available. The TAINY ComPortClient has added already existing physical COM ports of the PC to this. The assigned COM port number is dependent upon the configuration of your system. The COM ports of the TAINY ComPortClient are automatically appended to the end of the list of COM ports already found in your system.

Example:

In your system there are two physical COM ports (COM1 and COM2) and a serial Bluetooth adapter (COM3). The numeration of the virtual TAINY ComPorts thus starts at COM4.

If the application (e.g. net control station software) communicates through several COM ports, additional COM ports must be added to the TAINY ComPortClient, to a maximum of 254. These are then shown serially numbered in the main window of the TAINY ComPortClient.

Important for the configuration of the TAINY SwitchingCenter/ModemServer

When several COM ports are activated for the TAINY ComPortClient, a separate connection for each COM port must be configured for the TAINY SwitchingCenter / TAINY ModemServer. For the purposes of the TAINY SwitchingCenter / the TAINY ModemServer, the TAINY ComPortClient then appears in practical terms like several TAINY Connect Clients. As many connections must then be configured for the TAINY SwitchingCenter/ModemServer as the TAINY ComPortClient has COM ports.

In order to add additional COM ports, proceed as follows:

Add COM port

Menu **COM-Port, Add new COM port**

OR



click the appropriate icon: 

Enter the number of COM ports to be added.

Remove COM port 1. Mark the line of the relevant COM port



2. Menu **COM port, Remove selected COM port**
OR

click the appropriate icon: 

4.2 Configuration of the modem interface: dedicated lines or switched connections

Configure CPC COM ports for dedicated line

If the SW application functioning on the TAINY ComPortClient does **not** issue commands for modem control, define the following setting for the relevant COM port(s):

- Deactivate the **AT mode** checkbox.

Dedicated line mode: In this case it must be differentiated between two approaches:
LL (LL = Leased Line)

- If the SW application does not issue signals for the control of connections, the relevant COM port of the TAINY ComPortClient will maintain a constant connection to another defined TAINY Connect Client. This will be set up automatically as soon as the *Network active* checkbox is activated ("Always on"), see *Create/disconnect* connection to the TAINY SwitchingCenter/ModemServer on page 26.



The DTR hardware signal is not observed in the dedicated line mode.



The pairing for dedicated lines is in both cases configured by the TAINY SwitchingCenter / TAINY ModemServer.



Switched connections or dedicated lines can only then be created when the connections of the TAINY SwitchingCenter/ModemServer, which are allocated to the COM port of the TAINY ComPortClient, are configured for the appropriate type of connection (Switched connections or dedicated line) and when sufficient gate licences are available, so that a login on the TAINY SwitchingCenter / TAINY ModemServer can be carried out.

Enable switched connections

If the SW application functioning on the TAINY ComPortClient issues commands for modem control, define the following setting

for the relevant COM port(s):

Switched connection Activate the **AT mode** checkbox.
mode:

CS (CS = Circuit
Switched)

The relevant COM port of the TAINY ComPortClient now behaves like a modem. The telephone number passed on with the ATD selection command is transmitted to the TAINY SwitchingCenter. The TAINY SwitchingCenter / TAINY ModemServer then switches to the TAINY Connect Client, to which this telephone number is assigned. This switched connection is set up again as soon as the TAINY ComPortClient receives the ATH AT command or, depending upon the configuration, the DTR hardware signal switches off.

Accepting calls

In the activated AT mode, incoming calls are also accepted, insofar as the SW application issues the ATA AT command in the event of an incoming RING signal.

Alternatively, the TAINY ComPortClient can also be switched to *Automatic call acceptance*.

Automatic call acceptance

If the TAINY ComPortClient should automatically accept calls from remote TAINY Connect Clients, switch the relevant COM port(s) to *Automatic call acceptance* as follows:

When the *AT mode* check box is activated, send the relevant COM ports the following AT command with the SW application (Or a terminal program): ATSO=x, whereby "x" stands for the number of RING signals after which the call should be accepted.

Example: ATSO=2 defines that the incoming call is accepted after the 2nd RING.

The ATSO=0 AT command means that the incoming calls can only be accepted with the ATA AT command.

4.3 AT commands and responses

AT command set If the SW application (Net control station software) functioning on the TAINY ComPortClient works with modem commands (= AT commands), the TAINY ComPortClient can work in this mode. This means that it will be emulated for the SW application accessing a COM port of the TAINY ComPortClient as if a modem with a

Hayes-compatible AT command set is connected. The TAINY ComPortClient processes these modem commands like a traditional modem, establishes switched connections and accepts calls, etc.

However, due to the particular nature of these connections, most AT commands will not be required. For this reason, only the following modem commands are implemented for the TAINY ComPortClient. All other modem commands are acknowledged by the application with OK.

Process responses to AT commands

If your SW application expects a response other than "OK" for these other commands, you can use the AT command set editor to define which response the TAINY ComPortClient should issue to a certain AT command.

Proceed as follows:

Menu **Settings, AT command set**

OR



click the appropriate icon:



Enter the AT command in the command set editor and the required response following a " = ".

Example: `&G2=ERROR`

Result:

In response to the "&G2" AT command, the TAINY ComPortClient issues the "ERROR" response.

AT commands implemented with the TAINY ComPortClient

ATD <i>n</i>	Selection command; <i>n</i> is the telephone number to be selected
ATH	End call
ATZ0	Resets the settings of the AT command interface to the saved settings
AT&W	Saves the current settings of the AT command interface
AT&F	Loads the factory settings
AT&D0	DTR Drop off. Connection is not ended by DTR Drop or closing the COM.
AT&D2	DTR Drop on. Connection is ended with the falling edge of the DTR signal or when the COM port is closed
ATE0	Echo off
ATE1	Echo on
ATA	An incoming call indicated by "RING" will be accepted
ATO	Change from command mode to transparent mode for existing connection and prior +++

ATSO	Automatic call acceptance with ATSO=<n>, following n incoming RINGs
+++	Change from transparent mode to command mode for existing connection

Responses:

The TAINY ComPortClient, like a modem, issues responses to the SW application:

RING	Display for incoming call
OK	Positive receipt for an entered AT command
NO CARRIER	Selected carrier not reachable
NO DIALTONE	No connection to the TAINY SwitchingCenter / TAINY ModemServer
ERROR	False AT command
BUSY	Carrier busy

-{}-

4.4 Configure the TCP/IP connection to the TAINY SwitchingCenter

Menu **Settings, Usage**

OR



click the appropriate icon:

Enter the connection parameters (See below)

- The connection parameters must harmonize or be made to harmonize with those configured by the TAINY SwitchingCenter/ModemServer for the connection to the TAINY ComPortClient. Therefore, be sure to consult with the manager of the TAINY SwitchingCenter/ModemServer prior to the configuration of the TAINY ComPortClient.

Parameters to be defined

Server 1/

Server 2 (optional) Server:.....

Enter the address of the PC on which the TAINY SwitchingCenter / TAINY ModemServer is to be executed. The TAINY ComPortClient will then connect the application (e.g.

net control station software) with the TAINY SwitchingCenter/ModemServer. Enter the address:

- as IP address

OR

- as host name in the URL format.

Optional you can set a secondary server address. If the TAINY ComPortClient can not connect to the first address, it will try to connect to the secondary address.

See *Prerequisites for operation and installation*, page 10.

Port 1/

Port 2 (optional)

Port:.....

Presetting: 26863. The port entered here must agree with that through which the TAINY SwitchingCenter / TAINY ModemServer communicates. The port used by the TAINY SwitchingCenter/ModemServer is factory set to 26863. Only enter another port number when you know that another port number has been set on the TAINY SwitchingCenter/ModemServer for communication with the TAINY ComPortClient.

In any case, a port number higher than 20,000 should be selected. See also RFC 1700. (RFC (= Request For Comments), 1700 (=assigned numbers)) indicates a numerical series of documents about Internet standards.)

Max value: 65535

The following is to be observed if the TCP/IP connection for the TAINY SwitchingCenter is protected by a firewall: the firewall must be configured in such a way that the port is accessible. This applies for the PCs on both sides.

Connect Retry Interval [s]

Interval:.....

Presetting: 5. In the event that a connection to the TAINY SwitchingCenter cannot be established, the TAINY ComPortClient waits the period of time entered here (in minutes) before it makes another attempt.

If 0 is entered, the TAINY ComPortClient will make no further

attempts at a connection.

Allowed values: 0 to 999999

Attempts to establish a connection are made as long as the *Network active* checkbox is checked and the TAINY ComPortClient is not logged on to the TAINY SwitchingCenter / TAINY ModemServer. Some examples:

- The given IP address or port number of the TAINY SwitchingCenter/ModemServer is incorrect.
- A host name is configured as the address for the TAINY SwitchingCenter / TAINY ModemServer, but this cannot be resolved by the DNS server because no DNS server is accessible or because this has not provided a valid IP address.
- The authentication by the TAINY SwitchingCenter / TAINY ModemServer was acknowledged as an error (False port name, false password, account already being used, insufficient number of gate licenses).

Reconnect Retry Interval [min]

Interval:.....

Presetting: 30. The TAINY ComPortClient disconnects the current connection and establishes a new connection to the TAINY SwitchingCenter / TAINY ModemServer after timer interval expired.

Allowed values: 0 to 99999

TAINY ComPortClient makes only reconnect retries for ports in status „authenticated“. Ports in status „connected“ or „not connected to server“ are not affected.

Port name

Port name:.....

This is the name of the connection assigned to the TAINY ComPortClient at the TAINY SwitchingCenter/ModemServer, meaning that to which it is "connected".

With port name and password (See below) the TAINY ComPortClient identifies itself for the TAINY SwitchingCenter or TAINY ModemServer.



The port name actually transmitted to the TAINY SwitchingCenter/ModemServer is composed of two parts:

1. the port name defined here
2. the designation of the COM port through which the SW application creates the connection to the carrier.

The designation of the COM port automatically appends the TAINY ComPortClient to the port name you indicate, connected with an underline, meaning " _ " .

Example:

If the established name is *NetControlStation* and the net control station software creates a connection through the *COM3* com port, the following port name will then be transmitted to the TAINY SwitchingCenter/ModemServer:

NetControlStation_COM3

➤ Important for the configuration of the TAINY SwitchingCenter/ModemServer:

The extension of the port name with the COM port designation occurs in order that the TAINY ComPortClient can communicate via several different COM ports with the TAINY SwitchingCenter. This is necessary when the SW application, for example, the net control station software, is set up for various connection requirements on several COM ports - see *Add ports*, page 16. For the purposes of the TAINY SwitchingCenter / the TAINY ModemServer, the TAINY ComPortClient then appears in practical terms like several TAINY Connect Clients. As many connections must then be configured for the TAINY SwitchingCenter/ModemServer as the TAINY ComPortClient has COM ports.

This factor must be taken into account when configuring the TAINY SwitchingCenters/ModemServer!

Password

Password:.....

(Maximum of 30 characters, all letters and numbers, no spaces or special characters)

With port name (See above) and password, the TAINY ComPortClient identifies itself for the TAINY SwitchingCenter/ModemServer.

5 Configuration of the SW application for use of the CPC COM port of the TAINY ComPortClient

Configuration of the SW application for communication via the TAINY ComPortClient In the event that your SW application (e.g. net control station software) is designed or configured in such a way that it communicates through real COM ports (and modems), this setting must then be changed as follows:

- The SW application must use the COM ports provided by the TAINY ComPortClient. You should thus alter the COM port setting(s) for the SW application correspondingly.

Information to this purpose is found in the manual for the relevant software.

6 Operation: control of connections and monitoring of status

Prerequisites The following conditions must be met for the correct operation of the TAINY ComPortClient:

- the TAINY ComPortClient must be configured - see page 15

AND

- the SW application functioning on the TAINY ComPortClient must be correctly configured - see page 24.

Configuration of the TAINY SwitchingCenter:

In addition, the connection to the TAINY ComPortClient must be configured at the TAINY SwitchingCenter as follows:

When several COM ports are activated for the TAINY ComPortClient, a separate connection (Gate) for each COM port must be configured at the TAINY SwitchingCenter/ModemServer. For the purposes of the TAINY SwitchingCenter / TAINY ModemServer, the TAINY ComPortClient then appears in practical terms like several TAINY Connect Clients. As many connections must then be configured for the TAINY SwitchingCenter/ModemServer as the TAINY ComPortClient has COM ports.



Following the start, the TAINY ComPortClient runs as a service in the background. Its user interface is reduced to icon size and is only visible in the *Systray*, also known as the *Information area*, to the lower right in the Windows task bar.

Opening the main window is only necessary for the following operating steps:

User functions during operation

- | | |
|---|-----------|
| • Disconnect / create TCP/IP connection to the TAINY SwitchingCenter or TAINY ModemServer | } Page 26 |
| • View the TAINY SwitchingCenter/ModemServer | } Page 27 |

-{}-

6.1 Disconnect / create TCP/IP connection to the TAINY SwitchingCenter or TAINY ModemServer

During operation, the TAINY ComPortClient connects the SW application with the TAINY SwitchingCenter.

You can change the connection status for each COM port as follows:

Create/disconnect connection to the TAINY SwitchingCenter/ModemServer

The connection to the TAINY SwitchingCenter/ModemServer is controlled with the *Network active* checkbox:

- In order to create the TCP/IP connection to the TAINY SwitchingCenter, activate **Network active**.
- In order to disconnect the TCP/IP connection to the TAINY SwitchingCenter, deactivate **Network active**.


Only for all COM ports for which the *Network active* checkbox has been activated:

Only for COM ports with *Network active* = :

If you wish to simultaneously disconnect or reestablish all connections between these COM ports and the TAINY SwitchingCenter, you can do this by clicking on the following shift icon:

Disconnect all



Clicking on this icon results in the COM ports connected by  being disconnected from the SwitchingCenter/ModemServer.

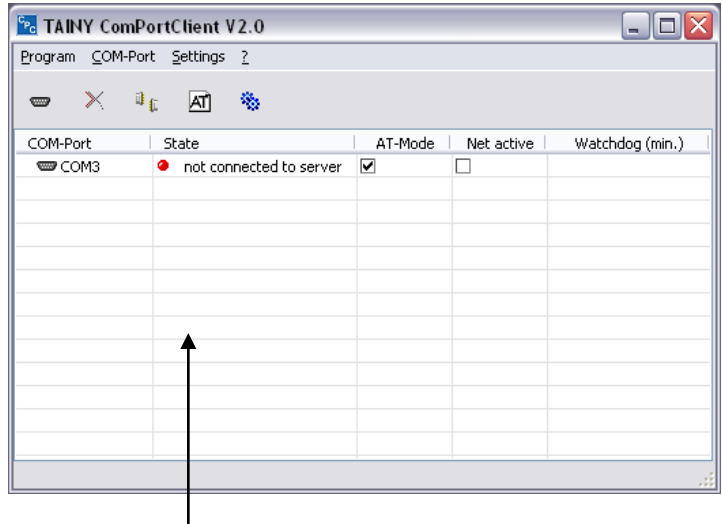
Connect all



Clicking on this icon results in all COM ports being connected with the TAINY SwitchingCenter/ModemServer via TCP/IP connection. (The *Network active* check box remains deactivated, thus without a check.)

6.2 View status of the TCP/IP connection to the TAINY SwitchingCenter/ModemServer

The connection status for each COM port of the TAINY ComPortClient (CPC) is shown in the program main window.



Various status messages can be displayed in the *State* column. These status messages will be listed and explained in the following:

Status displays of the connection to the TAINY SwitchingCenter/ModemServer

- not connected
 - No data connection to the TAINY SwitchingCenter/ModemServer
- Authentication pending
 - TAINY SwitchingCenter/ModemServer and CPC COM port are establishing the connection.
- authenticated
 - The CPC COM port is logged on to the TAINY SwitchingCenter/ModemServer and ready for operation.
- outgoing call ("ATD")
 - Another TAINY Connect Client is being called through the TAINY SwitchingCenter / TAINY ModemServer using the CPC COM port.
- incoming call ("RING")
 - The SW application on the CPC COM port is being called by another TAINY Connect Client through the TAINY SwitchingCenter / TAINY ModemServer.

- connected

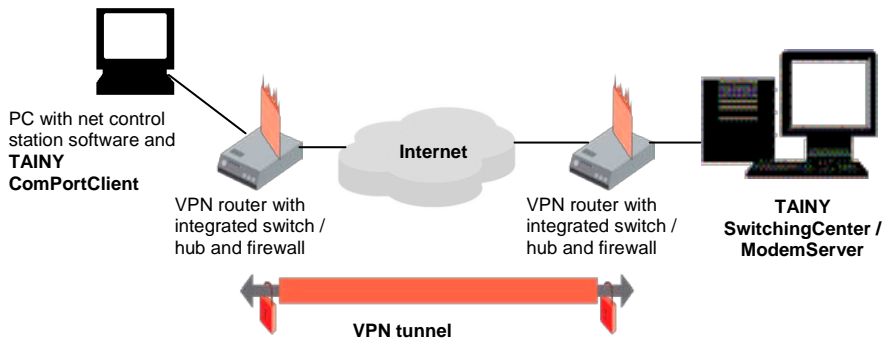
A connection to another TAINY Connect Client through the CPC COM port and the TAINY SwitchingCenter / TAINY ModemServer exists.

Watchdog (Min.) In order to monitor the network connection to the TAINY SwitchingCenter/ModemServer, each CPC COM port sends a data package (Watchdog package) at regular intervals to the TAINY SwitchingCenter/ModemServer. When this arrives at the TAINY SwitchingCenter/ModemServer, the data package is acknowledged by the TCP/IP mechanisms. If the package doesn't arrive, the TAINY SwitchingCenter / TAINY ModemServer closes the connection (Socket). The TAINY ComPortClient must reestablish the connection for the effected CPC COM port and log on again.

During the authentication, the TAINY SwitchingCenter/ModemServer transmits the latest point in time in which it expects to receive a Watchdog package. The CPC COM port must send the watchdog package within this period of time. The length of this timespan is shown in the Watchdog (Min.) column in minutes (0 = Watchdog switched off).

7 Security

This is at risk if the TCP/IP connection between the net control station PC and the TAINY SwitchingCenter/ModemServer is operated over the Internet. The Internet connection can be completely protected by an upstream VPN router with firewall.



Example: device arrangement for VPN tunnel in the Internet

8 What is that?

DynamicDNS-providers

make it possible to be accessible at a fixed Internet address

Also *Dynamic DNS provider*. Every computer that is connected with the Internet has an IP address (IP = Internet Protocol). An IP address consists of 4 numbers with a maximum of three digits, each separated by a period. If the computer is online over the telephone line with a modem, with ISDN or ADSL, the Internet service provider will dynamically assign it an IP address, meaning that the address changes from session to session. Even when the computer (e.g. with a flatrate) is online 24 hours uninterrupted, the IP address changes intermittently.

If a local computer is to be accessible over the Internet, it must have an address known to the remote carrier. Only in this way can it set up the connection to the local computer. However, this is not possible if the address of the local computer is constantly changing. That is, unless the operator of the local computer has an account with a DynamicDNS provider (DNS = Domain Name Server).

He can then define a host name with the provider under which the computer should be accessible in the future, e.g.: www.xyz.abc.de. The DynamicDNS provider also provides a small program that must be installed and executed on the relevant computer. During each Internet session of the local computer, this tool notifies the DynamicDNS provider of the current IP address of the computer. Its domain name server registers the current host name - IP address assignment and discloses these to other domain name servers in the Internet.

When a remote computer now wishes to establish a connection with the local computer, which is registered with the DynamicDNS provider, the remote computer uses the host name of the local computer as the address. This results in a connection to the relevant DNS (Domain Name Server) being established, where the IP address currently allocated to this host name can be found. The IP address is transmitted back to the remote computer and now used by this as the destination address. This now leads exactly to the desired computer.

This process is the basis of all Internet addresses. A connection to the DNS is first established in order to determine the IP address assigned to this host name. When this has been done, the connection to the desired carrier, any Internet presence, is established with this "found" IP address.

DynamicDNS providers can be found in the Internet at the following address: <http://netzadmin.org/ddns-provider.php>

COM port, virtual COM port The term "COM-Port" (Communication Port) describes a serial interface (V.24, RS-232) on a Windows PC. Applications programs use COM ports to transfer data to various devices, e.g. modems, PCs, terminals, etc. A COM port can have a plug (physical COM port) or be a software interface in the PC (Virtual COM port). Virtual COM ports behave like physical COM ports for application programs, whereby the data can be rerouted to other interfaces.

Client / Server In a client-server environment, a server is a program or computer that accepts enquiries from the client program or client computer and responds to them.

For data communication, one also refers to the computer as a client, which establishes a connection to a server (or host). This means that the client is the calling computer and the server (or host) is the called.

TCP/IP (Transmission Control Protocol/Internet Protocol) Network protocols used for the connection of two computers in the Internet.

IP is the basic protocol.

UDP builds on IP and sends individual packages. These may arrive at the recipient in a different order than they were sent or even be lost.

TCP secures the connection and ensures, for example, that the data packages are passed on to application in the correct order.

UDP and TCP supply port numbers between 1 and 65535 in addition to the IP addresses. The various services are distinguished by these.

A series of further protocols, including HTTP (Hyper Text Transfer Protocol), HTTPS (Secure Hyper Text Transfer Protocol), SMTP (Simple Mail Transfer Protocol), POP3 (Post Office Protocol, Version 3) and DNS (Domain Name Service), build on the basis of UDP and TCP.

ICMP builds on IP and contains monitoring 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.

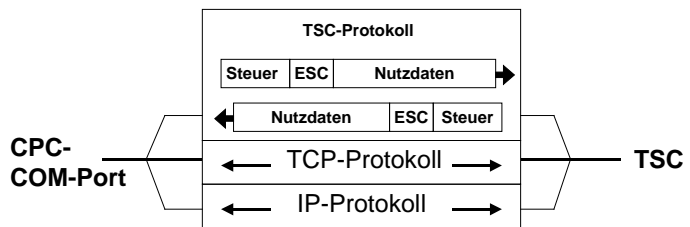
On a Windows PC, the WINSOCK.DLL (or WSOCK32.DLL) carries out the processing of both protocols.

TSC protocol

The TSC protocol is a standard designed by Dr. Neuhaus for the exchange of reference data, monitoring and control information between the TAINY SwitchingCenter and the TAINY Connect Clients over TCP/IP-based networks, whether wired (Internet, intranet (LAN)) or wireless (GPRS).

The communication of the TAINY Connect Clients with the TAINY SwitchingCenter takes place with the TSC protocol. Superimposed over the TCP/IP protocol, the TCP protocol bidirectionally transmits reference data, control and status information whose start are displayed with Escape characters. All reference data is transmitted veiled, in order to avoid the transmission of data in plain text.

The terminals of the TSC protocol are, on the one side, the TAINY Connect Client, and on the other, the relevant connection of the TAINY SwitchingCenter. The data from the TSC protocol received by the TAINY Connect Client is unpacked here and repacked into the TSC protocol in order to send it to the destination client.



Service provider

Provider, company or institution that provides users with access to the Internet or to an online service.

Protocol, transfer protocol

Devices that communicate with one another are subject to the same rules. They must speak the "same language". Such rules and standards are referred to as protocols or transfer protocols. Often used protocols include IP, TCP, PPP, HTTP or SMTP. TCP/IP is the generic term for all IP-based protocols.

VPN - Virtual Private Network

A Virtual Private Network (VPN) merges several private networks (Sub-networks) together through a public network, e.g. the Internet, into a shared network. Confidentiality and authenticity are thereby ensured by the use of cryptographic protocols. In practical terms, the VPN builds a tunnel through public networks. It is thus a cost-effective alternative in comparison to dedicated lines when the objective is to set up a supra-regional, tap-proof corporate network.

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