

Manual

EnOcean Com-Server



Release 1.00, June 2005

Model 59610

W&T

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W&T

The W&T EnOcean Com-Server enables linking of EnOcean RF sensors and actuators with visualization software and control systems over a TCP/IP Ethernet.

The EnOcean Com-Server passes the signal from the RF components to the software via Intra- or Internet, which generally communicates with the Com-Server via OPC. A single EnOcean Com-Server allows you to control up to 128 RF actuator groups, with an unlimited number of receiving RF sensors.

Important: In spite of various measures intended to increase transmission reliability, including repeated sending of wireless telegrams at random intervals, the fact that EnOcean components do not have an intrinsic acknowledgement function means that loss of a sent telegram cannot be completely precluded. In critical applications it is thus necessary to generate acknowledgements for successful transmission of a telegram from the process itself, such as by monitoring the wireless generated actions.



The converter has a 10/100 MBit Ethernet connection and a narrow DIN rail housing for ease of integration in building installations and control cabinets. Configuration of the device involves setting just a few network-specific parameters and is accomplished using a convenient software tool provided.

The EnOcean network interface is described on the following pages, including its technical data, configuration and wiring examples.

Up-to-date information about new products and current firmware and software can be found on the Internet at <http://www.wut.de> or in the e-mail notices from the W&T Interface Club, which you can subscribe to from the W&T homepage.

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Initial startup of the EnOcean Com-Server

Initial startup of the EnOcean Com-Server generally involves simply setting the IP address, the subnet mask and specifying any gateway which might be present.

These settings can be conveniently made using the *WuTility* management tool, which provides all the necessary configuration options and which can be found on the included product CD-ROM.

Additional assigning of a password for protecting the EnOcean Com-Server settings from unintended or unauthorized change can be done from the browser if Web-Based-Management on the converter is activated or from the WuTility using telnet.

Serial communication of the network interface using the integrated EnOcean RF module is set by default to a fixed format and should under no circumstances be altered, since this would prevent correct function of the converter.

Assigning the IP address

The EnOcean Com-Server is factory set to IP address 0.0.0.0. Before assigning a new one you must obtain an appropriate IP address from your system administrator. In smaller, unrouted networks use the IP address of your PC and simply change the last digit. Always note however that IP addresses must be unique within the network.



Every IP address must be unique within the network.

- ▶ IP assignment using the *WuTility* management tool
- ▶ Setting the IP address, subnet mask and gateway address using DHCP-/BOOTP protocol

Assigning the IP address using *WuTility*

The Windows tool *WuTility* allows you to inventurize Com-Server and Web-IO installations and to assign the IP address. The prerequisite is that the current address of the EnOcean Com-Server is 0.0.0.0 (= factory default setting) and that the computer containing *WuTility* be located in the same subnet.

Downloading and installing *WuTility*

The most current version is always available from our Web site under the following address:

<http://www.wut.de>

From there use the menu tree on the left side of the screen. The path

Products & Downloads → *Com-Server* → *Tools*

will take you directly to the page with the download link.

Die Installation erfolgt über einen Doppelklick auf die Datei *wutility_***.msi*. Der Start von *WuTility* erfolgt über

Start → *Programme* → *W&T Software Toolkit* → *WuTility*

IP assignment

Be sure that both the EnOcean Com-Server and the computer are connected to the network and are located in the same subnet. Some Windows versions also require that you are logged on to the PC as *Administrator*.

You can identify the desired EnOcean Com-Server based on its MAC address from the device list generated when starting *WuTility*. The displayed IP address must be 0.0.0.0.

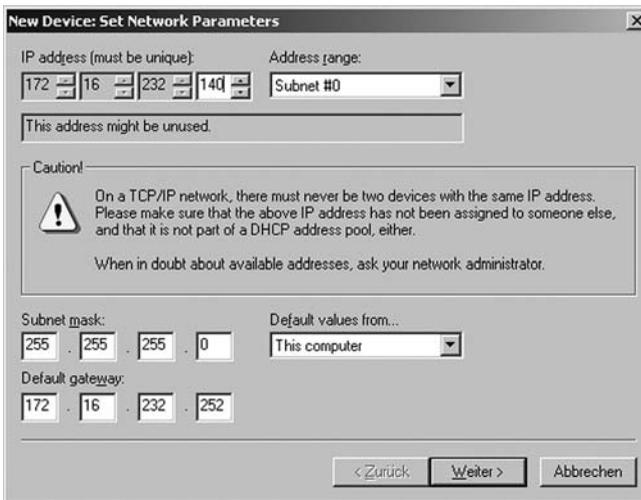


Every IP address must be unique within the network.

Select the EnOcean Com-Server and then click on the button



In the following window enter the values for the desired *IP address*, *subnet mask* and any *gateway* which might be present and confirm your entries by pressing *Continue*.



In addition, in the next window you can activate BootP (see following section) and configuration of the EnOcean Com-Server via Web Based Management (see section *Configuration via browser - Web Based Management*).

New Device: Advanced Features

Enable BootP

BootP provides a means for centralized assignment of IP addresses. Obviously you do not need it for this device (because you chose this method of assigning an IP address instead).

Moreover, the BootP option can cause problems in combination with some DHCP servers (devices getting random new IP addresses over and over again). We therefore recommend that you disable BootP at this point.

Enable Web-based management

on TCP port

The Web-based management (WBM) option lets you configure your serial Com-Servers using a standard Web browser.

WBM is most useful on TCP port 80. That is the standard port for HTTP, to which all Web browsers will connect by default.

< Zurück Weiter > Abbrechen

After confirming your entries with *Continue* the network parameters of the EnOcean Com-Server are correspondingly changed and the values entered in the device list:

This concludes assigning of the minimally required parameters. We recommend however that access to the EnOcean Com-Server configuration be password protected. This prevents applications accessing the interface accidentally changing the serial configuration of the device and thus affecting proper function.

IP assignment using DHCP-/BOOTP protocol

Many networks use DHCP (Dynamic Host Configuration Protocol) or BOOTP for centralized and dynamic assigning of IP addresses. Which of the two protocols is used in a given case does not matter to the EnOcean Com-Servers, since DHCP represents simply a downward compatible expansion of BOOTP. DHCP servers also make use of requests from BOOTP clients. The following parameters can be assigned to the EnOcean Com-Server using these protocols:

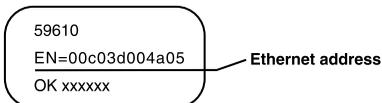
- IP address
- Subnet mask
- Gateway address

It is not possible to send any other parameters or a lease time.

Function description

To obtain an IP address the EnOcean Com-Server sends a corresponding BOOTP request as a broadcast to the network after each new start. The reply then generated by the DHCP/BOOTP server contains the IP address as well as the subnet mask and gateway address. The EnOcean Com-Server immediately stores this information in its non-volatile memory.

To start up the EnOcean Com-Server in DHCP/BOOTP networks, contact your system administrator. If you are using DHCP to assign the address, please note that a reserved IP address is needed. To add it to the respective address database, the administrator will need the Ethernet address of the EnOcean Com-Server, which can be found on the part label on the housing:



After the administrator has made the necessary entries, the EnOcean Com-Server automatically obtains the desired IP address after each reset. To ensure availability of the EnOcean Com-Server even should the DHCP/BOOTP server be down, the previous IP address is retained when no reply is forthcoming.



In DHCP environments the IP address to be assigned must be reserved by means of a fixed link to the Ethernet address of the EnOcean Com-Server. Under Windows NT this is done in the DHCP manager under the menu item „Reservations“.

Deactivating DHCP/BOOTP/RARP

A DHCP server assigns IP addresses dynamically from an address pool specified by the administrator. This means that DHCP-capable devices usually get a different IP address after every start. Since a constantly changing IP address is not desired in connection to the EnOcean Com-Server, the latter uses BOOTP protocol, which is based on fixed associations of Ethernet to IP address. DHCP servers should only reply to BOOTP requests if they have an explicit IP reservation for the Ethernet address of the sender.

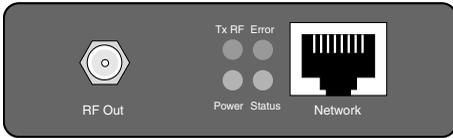
Some DHCP servers (e.g., Windows 2000 servers) however use both DHCP and BOOTP requests from your dynamic address pool. To prevent the EnOcean Com-Server from assigning unknown IP addresses to the user in such environments, the following options are available:

- Make a reservation in the respective DHCP server before connecting the EnOcean Com-Server to the network.
- In existing systems the BOOTP client of the EnOcean Com-Server can also be activated and deactivated at any time using the telnet configuration under
SETUP System → SETUP TCP/IP → BOOTP Client.

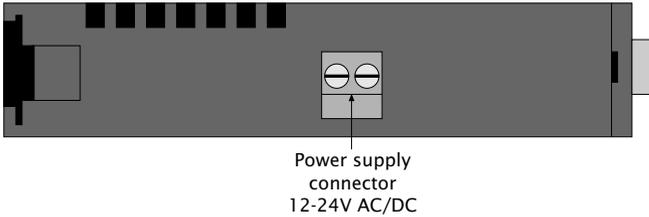
Connections, operating elements and displays

Form factor

Front side:

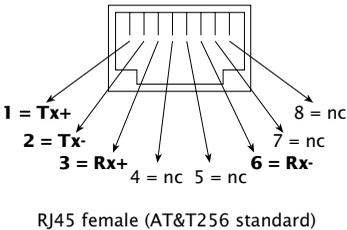


Bottom side:



Ethernet connection

The EnOcean Com-Server has an IEEE 802.3 compatible network connection on a shielded RJ45 connector. The pin configuration corresponds to an MDI interface, so that the connection to the hub or switch is made with a 1:1 wired and shielded patch cable.



10/100BaseT, autosensing

The EnOcean Com-Server supports both 10BaseT and 100BaseTx with a bit rate of 100 Mbps and the possibility of full-duplex transmission. Switching between the two network speeds is automatically set by the autosensing function of the converter depending on the capabilities of the hub or switch used. The prerequisite for 100 Mbps is suitable cabling (at least Cat. 5/ISO Class D).

Galvanic isolation

The network connection is galvanically isolated from the supply voltage with an isolation voltage of $500V_{\text{rms}}$.

Link status

The Error LED on the front panel of the device indicates the link status: when it flashes at 1-2 second intervals, the connection to the hub is either not present or is in a fault condition.

Antenna connection

The antenna of the EnOcean Com-Server is configured as an external $\lambda/4$ radiator so that the antenna can be installed for proper reception regardless of how the EnOcean Com-Server is installed. The antenna has a magnetic base to make installation easier.

The HF connection of the EnOcean Com-Server is implemented as an SMA socket to which the included external antenna is connected. Please use only the antenna included in the scope of delivery, since only this combination will ensure adherence to the emissions limits.



Although it is possible to extend the length of the antenna cable in theory, this will adversely affect the radiated HF power and the receiving sensitivity of the overall system.

Supply voltage

The supply voltage of the EnOcean Com-Server is brought in at the screw terminal located on the bottom of the housing. DC voltage of any polarity or AC voltage may be used. Following are the maximum and minimum values for the supply voltage:

- AC: 9Veff (-10%) .. 30Veff (+10%)
- DC: 12V (-10%) .. 48V (+10%)

If the plug-in power supply included in the scope of delivery is used, the plug pins can be connected to the screw terminals. The current draw is typically 70 mA at a voltage of 24 V DC.

LED indicators

■ **Power-LED**

Indicates presence of supply voltage. If the LED is not on, check the power supply connections.

■ **Status-LED**

The Status LED of the EnOcean Com-Server flashes whenever there is network activity on the RF interface. Periodic flashing indicates that the port has a valid connection to another network station. The status of the serial port can also be read out over the telnet configuration menu of the EnOcean Com-Server.

■ **Error-LED**

The Error LED of the EnOcean Com-Server indicates fault conditions using various flash codes. The error texts for the last five occurring serial faults and the associated system time (time between the last restart of the EnOcean Com-Server and when the fault occurred) can be read out using the telnet configuration tool.

1 x flashing = Check network connection

The EnOcean Com-Server cannot receive a link pulse from a hub. Check the cable or the hub port.

2 x flashing = Check serial data format

At least one character with a parity/framing error was received at the internal serial port, or the data register of the serial receiver chip was written to but the previous character had not yet been read out.

Please note that the serial format must always be set to 9600 baud, 8 bits, no parity, no handshake. All other settings will result in malfunction of the EnOcean Com-Server, since the integrated RF module only works with these parameters.

Power-, Status- and Error-LED on = self-test error

The self-test performed by the EnOcean Com-Server each time it is started or reset could not be correctly finished. This error can occur if you have prematurely aborted a software update and could not send the complete operating software. The EnOcean Com-Server is no longer operative in this state. Repeat the software update over the network (see section *Firmware update*) and address the EnOcean Com-Server with its assigned IP address.

If this does not remedy the fault or should it occur for reasons other than an incomplete software update, please return the device for inspection.

■ **RF Out - LED**

Indicates sending of EnOcean RF telegrams. The LED flashes briefly each time a data telegram is sent.

Configuration access to the EnOcean Com-Server

After finishing hardware installation and assigning the IP address, the remaining configuration of the EnOcean Com-Server is done over the network. Here either a telnet client or, after corresponding activation, an Internet browser can be used.

Structure of the configuration menu

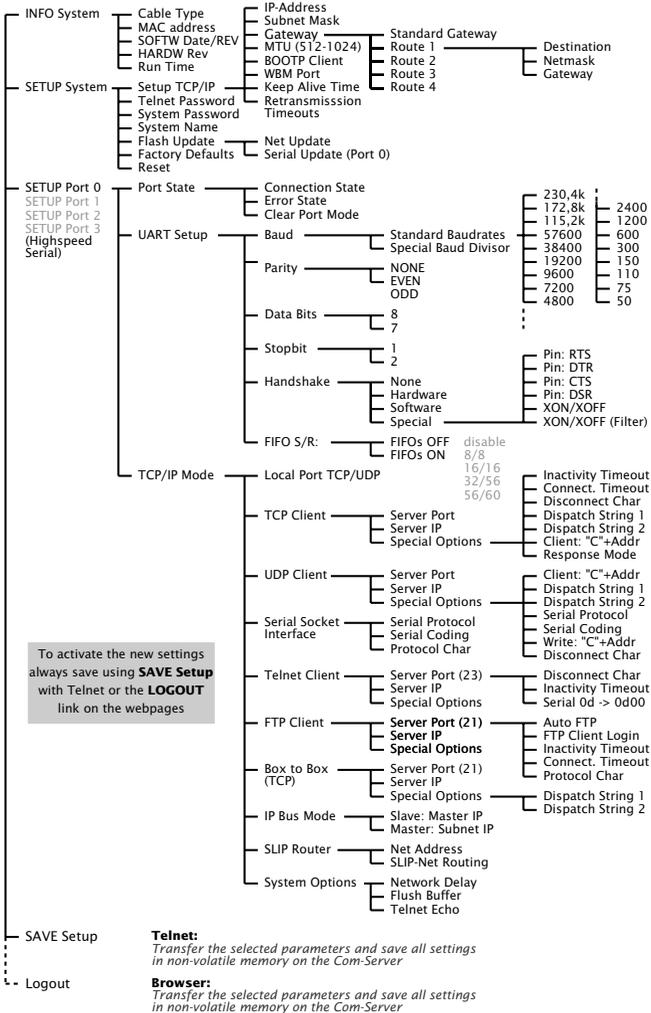
Regardless of whether a telnet client or Internet browser is used for configuration, the setup of the EnOcean Com-Server is tree structured. The following illustration shows an overview of all levels with their respective parameters.

A valid IP address must have already been assigned to the EnOcean Com-Server before configuring (see section *Assigning the IP address*). Access is then possible from virtually any computer having network access and an installed TCP/IP protocol.

A description of both configuration accesses, their dependencies as well as the respective navigation within the menu tree is contained in the following sections

HTTP protocol and its standard port 80 are frequent targets of Web attacks. So as not to affect data throughput of the applications and the EnOcean Com-Server, Web Based Management is therefore deactivated by default. Ways of activating it as part of initial startup can be found in the section on Web Based Management.

Configuration menu tree:



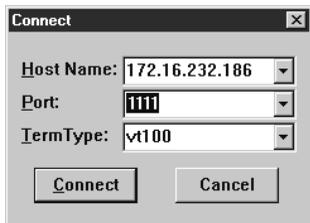
Configuring via telnet

A telnet client is included standard with nearly all operating systems which support TCP/IP protocol. Under Windows this is usually found in the Windows root directory. The configuration menu for the EnOcean Com-Server can be reached through TCP port 1111. You must therefore start the connection from within the telnet client using the corresponding parameters:

Telnet [IP address] 1111

[address] = IP address of the Com-Server
1111 = Configuration port of the Com-Server

Under Windows 9x/NT you only need to invoke *Start r Run telnet*. Then in the submenu *Network system...* of the *Connect* enter as the host name the IP address of the EnOcean Com-Server and then port number "1111".



If the connection was opened successfully and no system password is assigned (= factory default), you will see the following menu in your telnet window. If a system password was configured you will be prompted for it before the menu.

```
*****  
* Com-Server Highspeed *  
*****  
1. INFO System  
2. SETUP System  
3. SETUP Port 0 (High-Speed Serial)  
4. SAVE Setup
```

The items *INFO System*, *SETUP System* and *SAVE Setup* as well as their submenus are described in the following section *Basic configuration of the EnOcean Com-Server*. The description of the individual menu branches and the respective parameters is described in the following sections.

Navigation within the telnet menu

The overview of the entire configuration menu of the EnOcean Com-Server is shown on the previous page. You will see only one level of the selected menu on the monitor. Simply entering the number of the desired menu branch and pressing the ENTER key will take you to the next level. Entering *q* or pressing the ENTER key takes you back to the last menu level.

The last configured value of a menu item appears in parentheses. When you make changes the new value appears at this point the next time the menu is opened. It only becomes effective in the EnOcean Com-Server however if you have saved it using *SAVE Setup*.

As long as you do not open this menu item, you can move around in the entire menu and change values without any changes taking effect.

Configuring via browser - Web Based Management

The EnOcean Com-Server can also be configured using HTTP protocol and a standard Internet browser. The menu structure of WBM (Web Based Management) is compatible with the telnet configuration.

For reasons of security and downward compatibility, Web Based Management is deactivated by default.



If you exit the configuration menu by closing the Telnet connection without first doing a SAVE Setup, the original configuration will be retained.

Activating WBM with the WuTility-Tool

WBM can also be activated as part of the initial IP assignment using the *WuTility* inventory and management tool. Activate the option *Enable Web Based Management* in the corresponding program window and enter the desired TCP port (Standard port = 80).

Activating WBM with the WuTility tool

To activate WBM on an already running EnOcean Com-Server, you can use a telnet configuration. Start a telnet session on Port 1111 of the EnOcean Com-Server. In the menu branch

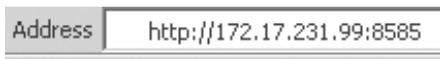
2. SETUP System → 1. Setup TCP/IP → 6. WBM Port

enter the decimal number of the desired TCP port under which you want WBM to be reached. Then press the *Return* key until you are back in the main menu and there open *SAVE Setup*. After you have closed the telnet session you can now access the EnOcean Com-Server from an Internet browser.

Starting the navigating the WBM

To access the Web sites after activating the WBM, start your Internet browser and in the address line enter the IP address of the EnOcean Com-Server and the configured port number:

http://[IP address]:[port number]



If the HTTP standard port 80 was configured for WBM, you can skip entering the port number in the address line.

You are now at the start page of the EnOcean Com-Server with a prompt for the system password. The factory default setting is for no password, so actuating the *Login* button takes you to the configuration menu.

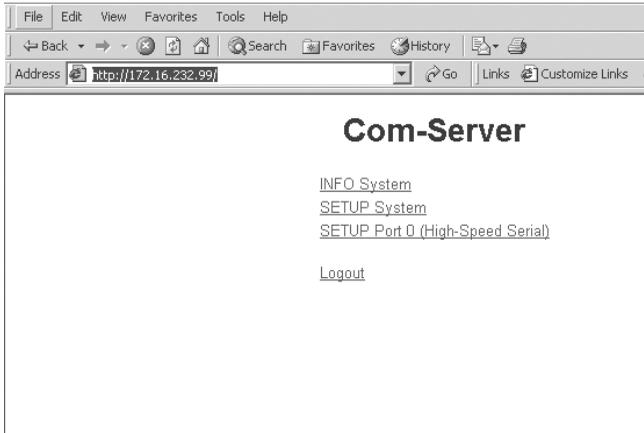


Navigation

Since the WBM of the EnOcean Com-Server is session oriented, you must use the *Back* links and corresponding control buttons to navigate to the individual Web pages. Use of the back functions in the browser can lead to problems in transferring the set parameters.

During a configuration session you can make as many settings as desired. Clicking on the *Send* button on the individual pages causes the EnOcean Com-Server to temporarily buffer store them. Once all the settings have been done, always exit the configuration session using the link *Logout* and the *Save* button.

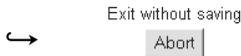
Only this way are the settings you made stored in the non-volatile memory of the EnOcean Com-Server and then activated.



The logout page then offers the following options for ending the configuration session:



Clicking on the Save button transfers all changes made to the non-volatile memory of the EnOcean Com-Server and ends the configuration session.



Clicking on the *Abort* button causes the EnOcean Com-Server to cancel all the settings made and ends the configuration session.



Clicking on the *Restore Defaults* button resets the EnOcean Com-Server to its factory setting. All settings including the network parameters IP address, subnet mask and gateway address are lost.



Clicking on the *Firmware Update* button activates the mode in which the .EnOcean Com-Server expects a firmware update using TFTP protocol (see section *Firmware update for the EnOcean Com-Server*). Update mode can only be quit by complete transmission of a valid firmware or by interrupting power. If the WuTility tool is used for the firmware update, this mode is automatically started. A manual start is not necessary in this case.



Clicking on the *Hardware Reset* button resets the EnOcean Com-Server, similar to interrupting the supply voltage. Data from any other open connections to the EnOcean Com-Server will be lost in this case.

The functions located on the logout page of the EnOcean Com-Server can be found also in the telnet menu branch SETUP System → Setup TCP/IP.

Basic configuration of the EnOcean Com-Server

This section is devoted to an explanation of the relevant configuration options which pertain to the operating system of the EnOcean Com-Server and which are not directly related to the serial port. The arrangement and function of the individual parameters within the menu structure are for the most part identical to configuring via telnet and the Internet browser.

All menu tree entries not described are not relevant to operation of the EnOcean Com-Server and should not be changed from their settings as delivered. Changes to these functions can result in malfunction of the device, which in extreme cases will require resetting to the factory settings.

Saving the settings

Whether configuring via telnet or using Web Based Management, all changes are first temporarily saved in the EnOcean Com-Server. To have the settings available after a reset or power interruption, each configuration session must be ended with explicit saving.

Telnet

Select *SAVE Setup* in the master menu. To the prompt *Save Changes?* enter *y*. If the entry was correct, *Saving...* appears on the monitor and the EnOcean Com-Server saves all the settings you made in its non-volatile memory. Once the data have been stored, they are automatically activated each time you power-up or reset the EnOcean Com-Server.

If you enter anything other than *y* or simply press the Enter key, you are returned to the main menu without saving the values.



*Exceptions are the network parameters, IP address, subnet mask and gateway, since these are also relevant for the running configuration session. To save and activate them the telnet configuration must be quit using *q* after choosing *SAVE Setup*. The EnOcean Com-Server then automatically performs a reset and only then works using the new settings.*

Browser - WBM

Exit the configuration session using the link *Logout* and click on the *Save* button.

Menu: INFO System

This menu allows you to obtain the device-specific parameters such as version number and create date of the firmware, MAC address of the device, etc.

↳ **Cable Type**

Indicates the speed, whether the connection to the hub or switch is running with 10BaseT or 100BaseTx.

↳ **MACaddress**

Indicates the Ethernet address of the EnOcean Com-Server. This number is factory set and registered. It cannot be changed.

↳ **SOFTW Date/Rev.**

Indicates the create date and version number of the operating software in flash.

↳ **HARDW Rev.**

Indicates the revision status of the EnOcean Com-Server hardware.

↳ **Run Time**

Indicates the time in hours and minutes since the last restart of the EnOcean Com-Server.

Menu: SETUP System

This menu is where all parameters affecting the operating system of the EnOcean Com-Server and which are independent of the serial port are configured

Menu: SETUP System – Setup TCP/IP

↳ **IP address** (Default= 0.0.0.0)

Enter here the IP address if you want to change it. Please note that this number is not freely selectable, but rather should be specified depending on the network address of the TCP/IP network. The entry form corresponds to the usual syntax (e.g. 172.16.231.5).

↳ **Subnet Mask** (Default = 255.0.0.0)

The subnet mask only needs to be entered if the EnOcean Com-Server will be opening connections to another subnetwork. Enter the subnet mask of the subnetwork in which the EnOcean Com-Server is located (e.g. 255.255.255.0).

↳ **Gateways** (Default = 0.0.0.0)

In this menu tree you can configure the IP address of the standard gateway or routers. If not fixed routes are configured, the standard gateway for all network packets whose destination IP address is not in the local subnetwork are used.

↳ **Route 1 - 4 (Destination, Netmask, Gateway)**

In addition to the standard gateway up to four fixed routes can be defined. Packets whose destination IP addresses are located in the networks configured here (=Destination) are always delivered over this gateway associated with this route. A fixed route is only accepted by the EnOcean Com-Server if the following check is true:

$$\text{Destination AND Netmask} == \text{Destination}$$

If the result is not the same as Destination, the entries are rejected.



Changes to the system parameters IP address, Subnet Mask, Gateway and Route 1-4 cannot be activated immediately after saving. Only after closing the current telnet connection with q does the EnOcean Com-Server work with these values.

↪ **MTU - Maximum Transfer Unit** (Default: 512)

This value determines the maximum size of a TCP/IP packet. It refers to the number of bytes (excluding header) which can be sent in a packet. The smaller the MTU selected, the more network buffers are available overall in the EnOcean Com-Server. The selectable range begins at 512 and ends at 1024 bytes. The values can be set in increments of 128 bytes (automatic rounding).

↪ **BOOTP Client** (Default: 1 = ON)

The factory setting is for DHCP-/BOOTP protocol activated (menu entry = 1) and the EnOcean Com-Server attempts after every reset to get an IP address from a DHCP or BOOTP server. Entering „0“ deactivates the function (see section *Assigning the IP address using DHCP-/BOOTP protocol*).



Some DHCP servers also assign an IP address upon a BOOTP request from their dynamic pool. To prevent the EnOcean Com-Server from getting a different IP address after every reset in such environments, BOOTP protocol must be deactivated.

↪ **WBM Port** (Default: 0000)

The value specifies in decimal form the TCP port under which the Web Based Management (WBM) of the EnOcean Com-Server can be reached from an Internet browser. The factory setting is 0000, which means that WBM is deactivated. If for example the value 80 (= standard port HTTP) is set, Web configuration can be invoked from an Internet browser without having to explicitly specify the port number.

It is sufficient to specify the IP address or the name of the EnOcean Com-Server stored in the DNS. When using other port numbers these must be separated in the address line of the browser by a colon (e.g. `http://172.17.231.49:1234`).

↪ **Keep Alive Time (sec)** (Default: 0 = OFF)

If the keep alive check is activated by entering and saving a value in second ticks, *all* TCP connections are monitored for network-side data traffic. If there is no network traffic within the set time, the EnOcean Com-Server generates a keep alive packet. If the other party dies *not* answer this packet, the connection in the EnOcean Com-Server is reset. Any data present in the serial in- and output buffers are deleted.

Example: A TCP client has opened a connection to the TCP server port 8000 on the EnOcean Com-Server and the network connection is then interrupted. After the set keep alive time, plus 2s for two repetitions, the EnOcean Com-Server closes the connection and is then available for any other clients.

↪ **Retransmission Timeouts (ms)** (Default: 240)

This timeout specifies how much time elapses before network packets are repeated if necessary. In most networks the default setting of 240 ms can be used. Only in the case of very large latency times between the EnOcean Com-Server and its respective communications partner may this value need to be increased.

Menu: SETUP System – Telnet Password

At this point you can specify an 8-character, hexadecimal (character range = 0 ...9 + a ...f) password for protecting the configuration menu from unauthorized access. The factory setting is 00000000. This allows unrestricted access to the configuration menu of the EnOcean Com-Server.

A valid password is immediately asked for after opening the telnet connection to the configuration port. If the entry is incorrect, access to the configuration port of the EnOcean Com-Server is denied.



Resetting or changing any parameters including the password itself is only possible by knowing the old password. For this reason you should write it down and keep it in a secure place.

Menu: SETUP System → System Password

The system password consisting of any 31 characters protects all configuration and control accesses to the EnOcean Com-Server as follows:

- 1111: Telnet configuration menu
- [WBM-Port]: Web Based Management (if activated)
- 8003: Reading the configuration file
- 8004: Writing to the configuration file
- 8888: Resetting the EnOcean Com-Server
- 9084, 9184, 9284, 9384: Reset Port Status A-D
- 9094, 9194, 9294, 9394: Control port A-D
- 161 (UDP, SNMP)

On telnet port 1111 as well as the WBM port the system password is asked for directly after opening the connection. For all other listed TCP ports the password must be sent to the EnOcean Com-Server no later than 2s after opening the TCP connection.

Requests from SNMP managers are only replied to by the EnOcean Com-Server if the *Community* corresponds to the system password.



The system password has a higher level than the telnet password. This means after assigning a system password any previously set telnet password becomes invalid, and the system password must be used for all password entries.

Menu: SETUP System – System Name

The freely configurable system name consisting of maximum 31 characters is used for identifying the EnOcean Com-Server. It is displayed as the start message in the client for all telnet connections.

Menu: SETUP System – Flash Update

Before you activate one of the two following modes, be sure that any active network connections have been closed first. Then confirm with *y*. Update mode is indicated by illumination of the Status LED of the EnOcean Com-Server.

↪ Net Update (TFTP)

Activate this mode if you want to perform an update of the operating software of the EnOcean Com-Server over the network using TFTP (see section Firmware update of the EnOcean Com-Server).

↪ Serial Update (Port 0)

This update mode is not available for the EnOcean Com-Server.



You may exit update mode only after the update has been completely finished or by performing areset, i.e., interrupting the power

Menu: SETUP System – Factory Defaults

Enter a *y* to restore the EnOcean Com-Server to its factory default settings. The configuration will then correspond to the defaults stored in the EnOcean Com-Server. The EnOcean Com-Server closes the telnet connection. It then performs a software reset to activate the new configuration.



Resetting the non-volatile memory results in the loss of all settings different from the default values, including the IP address. The setting profile of the factory defaults may under some circumstances be replaced by a custom profile. In this case the custom settings are activated after resetting.

Menu: SETUP System → Reset

Select this menu item to perform a software reset on the EnOcean Com-Server. First the telnet connection is properly closed.



All data from any still opened network connections are lost!

Data communication

Communication between the visualization software or host system and the EnOcean Com-Server is generally handled over the standard software interface OPC.

Direct access to the data of the integrated EnOcean RF module is of course also possible by exchanging the information between application and EnOcean Com-Server through the W&T COM Port Redirector. In this case the data in- and output of the EnOcean RF module appears as a virtual PC COM port through which the application itself has to process the EnOcean protocol.

The EnOcean Com-Server also makes it possible to handle the data transfer with the EnOcean components using TCP/IP or UDP/IP protocol. Information on using this communications procedure is available on request.

An inexpensive visualization and automation software package for smaller applications is the „Showit“ program developed and marketed by

Ingenieurbüro BAUER
Güntherstraße 6
D-14612 Falkensee
Tel.: +49 (0) 3322 / 21 21 103
Fax: +49 (0) 3322 / 21 79 75
E-Mail: info@showit.de
www.showit.de

A free demo version of the program is available on the Internet. This is a full version which is available for a limited period of use for testing purposes.

OPC-Server

The W&T OPC server is the communications interface for the EnOcean Com-Server running under Windows-based systems which allows use of standard software applications for control and visualization. Many visualization programs, such as Show-It, Wonderware or LabView are able to use this software interface as an OPC client. This allows the integrator to concentrate fully on programming the application without having to deal with the details of the EnOcean protocol.

Installing the OPC server

The W&T OPC-Server for network I/O devices is contained on the W&T product CD included with every EnOcean Com-Server. You will find the software under menu item *EnOcean > OPC-Server*. Clicking on the *Install* button the associated installation program guides you through the steps for setting up the OPC server on your PC.

Since the OPC server is regularly enhanced with function additions, W&T makes the current version of the software available on the Internet at www.WuT.de. The link to the OPC server is found under *Tools* on the data sheet page of the EnOcean Com-Server.

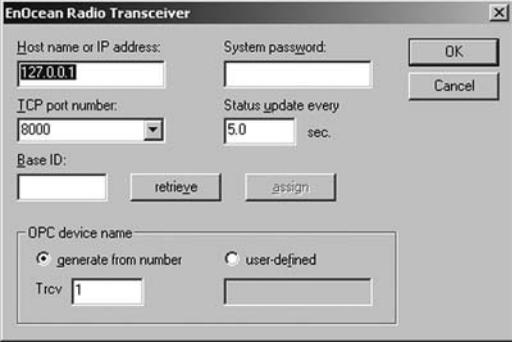
You do not have to deinstall the previous version to update to a new version of the OPC server.

Setting up the OPC server

Access to an EnOcean Com-Server and its associated RF sensors and actuators through the OPC interface requires that you first set up the EnOcean Com-Server within the OPC server. In a second step you assign the Com-Server in the OPC server its EnOcean components.

Setting up the EnOcean Com-Server

Under *Device > New Radio transceiver* a configuration window opens where you can enter the parameters for a new EnOcean Com-Server:



The screenshot shows a dialog box titled "EnOcean Radio Transceiver" with the following fields and controls:

- Host name or IP address:** A text input field containing "127.0.0.1".
- System password:** An empty text input field.
- TCP port number:** A dropdown menu showing "8000".
- Status update every:** A text input field containing "5.0" followed by "sec.".
- Base ID:** An empty text input field with "retrieve" and "assign" buttons next to it.
- OPC device name:** A section with two radio buttons: "generate from number" (selected) and "user-defined".
- Ttcrv:** A text input field containing "1" and an empty text input field next to it.
- Buttons:** "OK" and "Cancel" buttons are located in the top right corner.

Hostname or IP address:

In this field you enter the IP address which was assigned to the EnOcean Com-Server at installation. Alternately you can use a name instead of the IP address, if a host name was assigned the address via DNS or a similar name service.

TCP port number:

8000 is the default value for the TCP port number. This value can be changed and desired and must be adjusted corresponding to the setting for the Com-Server. We recommend however leaving this value unchanged.

Base ID:

In this field you enter - if known - the base ID of the EnOcean transceiver module built into the Com-Server. The ID is required for sending RF telegrams over the EnOcean Com-Server, since the integrated transceiver module has to be accessed for sending with its own ID. If this value is not known, you can obtain it from the Com-Server by clicking on the *Retrieve* button.

System password:

If a password was set in the Com-Server, that access code must be entered in this field. Required entry of a password protects the configuration of the EnOcean Com-Server from being changed without authorization. Caution: If the password is lost or forgotten, there is no way of accessing the Com-Server settings. In this case the Com-Server will have to be reset to the factory default values.

Status update every:

A regular status query simply checks whether the device is still accessible. The time interval of these queries can be set in this field.

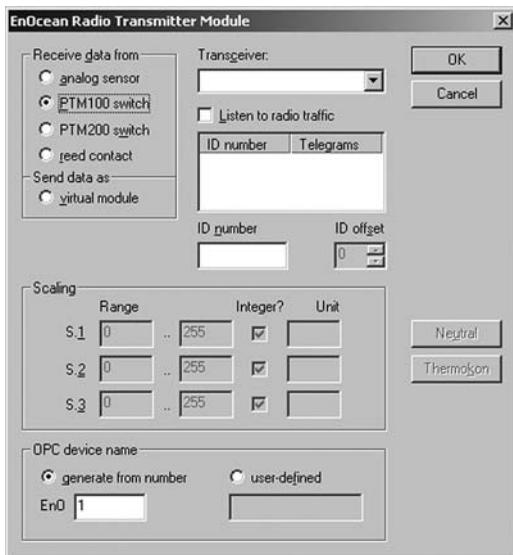
OPC device name:

The name you select here is used only for linking the EnOcean Com-Server with the sensors and actuators associated with it. The name is not part of the OPC variable name. The OPC device name can be automatically generated or assigned. In the former case the name has the format *Trcv[n]* where n= 1..65536.

Allocation of sensors and actuators

In a second step the sensors to which the Com-Server is supposed to respond are allocated to the EnOcean Com-Server. If needed, signals of *virtual modules* can also be created by means of which the EnOcean Com-Server can control RF actuators which it has learned.

In the window of the OPC server select the EnOcean Com-Server to which you want to allocate the components. The menu item *Device > New Radio module* takes you to the following entry screen in which the linked EnOcean components can be configured:



Transceiver

In this field select the name of the Com-Server to which the EnOcean components should be assigned.

ID number

The ID number is the unique number assigned to an EnOcean module at the factory as an 8-place hexadecimal number. On some units it is printed legibly, but on others unfortunately not. Enter - if known - the ID number for the sensor which you want to assign to the Com-Server. If there is no such information available, you can use the option *Listen to RF traffic* to pick up the ID of a data telegram sent by the sensor and enter it in the ID number field. This field is not relevant for assigning virtual signals to the EnOcean Com-Server.

Listen to radio traffic:

If the ID number cannot be obtained by any other means, activate this function and have the corresponding EnOcean device send a few RF telegrams. Once you are sure you have identified the device, you can copy its ID number from the list by clicking on it with the mouse.

OPC device name

All OPC variables for a device begin with a common name component which you can specify here. The OPC device name can be automatically generated or assigned here. In the former case the name has the format *EnO[n]* where n= 1..65536

Module type

Select whether the component is an analog sensor based on the EnOcean STM100 module, an RF sensor based on EnOcean type PTM100 or PTM200, or whether an RF actuator is to be controlled with a virtual signal.

Analog sensor

To link an analog sensor with the EnOcean Com-Server you must enter the sensor ID or copy the ID from the RF traffic as well as assign (selected or automatically generated) an OPC name for the sensor.

In the case of the three A/D converter channels of the ST100 analog sensor module you can also scale the obtained values. The STM 100 analog sensor module is not a finished end product, but rather is installed by various manufacturers into their own sensor applications. It itself contains no sensors and in its RF telegrams only provides raw 8-bit A/D converter values. According to which law these correspond to a physical variable (e.g. temperature) depends on the connected measuring circuit and can normally be looked up in the data sheet for the sensor application.

As a specific example we have provided scaling parameters for the room temperature sensor SR04 made by Thermokon Sensortechnik GmbH („Thermokon“ button).

PTM100 or PTM200 switch

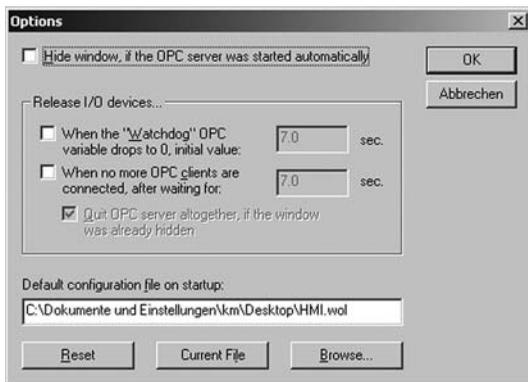
Linking one of the above named switch types to the EnOcean Com-Server simply requires that you enter the sensor ID or take it from radio traffic, and assign a freely or automatically generated OPC name for the sensor.

Virtual module

With „virtual signals“ you can control RF actuators through the EnOcean Com-Server. For this purpose the Com-Server simulates the button press of a PT100 radio switch and generates radio telegrams having the contents of such a component. Generation of a virtual send signal requires only entry of an ID offset and a freely or automatically generated OPC name. The ID offset is added to the base ID of the EnOcean transceiver module to form an overall ID which is integrated in the respective EnOcean Com-Server.

Concluding the installation

Once all the components have been entered, you should store the complete device list in a configuration file using *File > Save as* Starting the OPC server with the correct configuration file is made much easier if you specify the path and name of the stored file under *OPC-Server > Options > Default configuration file on startup.*



OPC server start

If when the OPC server was installed you selected *Standard configuration file at program start*, opening an OPC client immediately loads the OPC server and starts it in the correct configuration.

If no configuration file was specified, starting the OPC client does load the OPC server but does not start it due to lack of an available configuration. In this case you must explicitly load the configuration file using *File > Open* and start the OPC server using *OPC-Server > Start/Stop*. The started OPC server can be deactivated through the same menu path.

If you start the OPC server by double clicking on the configuration file, you must also likewise start it using *OPC-Server > Start/Stop*.

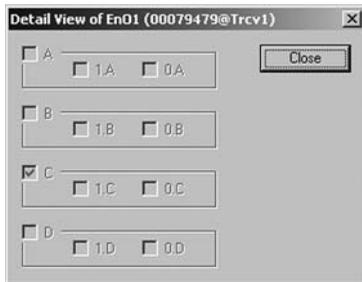
To prevent errors we therefore strongly urge you to configure the OPC server such that a configuration file is automatically loaded at program start.

Diagnostic function of the OPC server

The OPC server makes it possible to show and affect the status of the connected EnOcean components without being connected to an OPC client. While the OPC server is running you only have to double click on an EnOcean device to open one of the following windows.

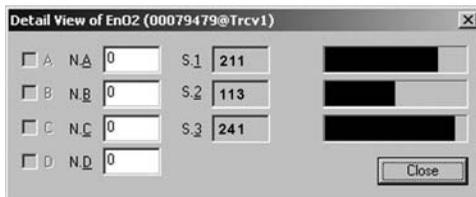
Digital sensors:

PTM100 type RF sensors the actuated sensor is indicated by small check marks:



Analog sensors:

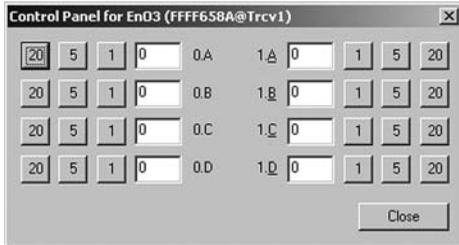
For PTM100 type analog sensors the measured values on the three analog channels are output both as a numerical value and as a bar graph. In addition the status of the digital inputs is indicated by small check marks:



Virtual modules:

In the following window you can drive radio actuators using radio telegrams which simulate a PTM100 sensor.

The window represents the switching state possibilities of such an radio sensor and also allwos you to determine the button-press duration in increments of 100, 500 and 2000 ms.



Learning actuators

The ability to generate data telegrams directly from the OPC server is quite useful for learning actuators. This does not require using an OPC client for generating data telegrams.

This learning procedure is not different from the standard EnOcean learning procedure:

EnOcean Com-Server and receiver are brought to within a few meters of each other. Then learning mode on the receiver is activated as described in the manual for the receiver. To assign the EnOcean Com-Server and receiver, exactly one (!!) data telegram is sent to the latter from the window shown above.

Attention: another data telegram with the same information resets the entry in the assign list of the actuator.



This concludes the procedure and the actuator can now be driven through the EnOcean Com-Server.

OPC variables for EnOcean RF modules

The OPC server provides the OPC variables described below for the various EnOcean components. Device names EnO1, EnO2, EnO3 should be considered examples only.

OPC-Variables for analog sensors

EnO1.A - EnO1.D (Boolean variable, read-only access):
State of the binary inputs.

Note: These signals are inverted with respect to the binary content of the data telegrams. But since most buttons are wired as pull-down to ground, this in fact means that a „1“ corresponds exactly to a pressed button and a „0“ to a released button, just as one would expect.

EnO1.N.A - EnO1.N.D (Integer variable, Read/write access):
Event counters which are always integrated when the associated binary input A - D changes from 1 to 0. Any desired values count be written in, but the most logical write process would be simply resetting to 0.

EnO1.S.1 - EnO1.S.3 (Integer- or real variable, read-only access):
Analog sensor measured values. If no scaling is used, these are whole-number values between 0 and 255. Depending on the configuration these variables can also however be floating decimal numbers with a concrete meaning and represent a temperature value in degrees Celsius, for example.

OPC variable for button modules

EnO2.0.A - EnO2.0.D (Boolean variable, read-only access):
Status „pressed/released“ of the lower halves of the rocker switches A - D (identified on the housing with „0“).

EnO2.1.A - EnO2.1.D (Boolean variable, read-only access):
Status „pressed/released“ of the upper halves of the rocker switches A - D (identified on the housing with „1“).

EnO2.A - EnO2.D (Boolean variable, read-only access):
Logical state of the rocker switches A - D: 0 or 1 depending on whether the lower or upper half of the rocker switch was last

depressed. This information is inferred indirectly by the OPC server from the sensor messages and is therefore not available until after at least one button press has been registered.

OPC variable for virtual modules

EnO3.0.A - EnO3.0.D (Integer variable, Read/write access): Assigning a value which is not 0 corresponds to pressing the lower half of one of the rocket switches A - D.

The value is counted down at ten increments per second. As soon as it reaches 0, the button press is ended. Setting the variable to 20 then would result in a 2 second long pulse.

EnO3.1.A - EnO3.1.D (Integer variable, Read/write access): Assigning a value which is not 0 corresponds to pressing the upper half of one of the rocket switches A - D.

The value is counted down at ten increments per second. As soon as it reaches 0, the button press is ended. Setting the variable to 20 then would result in a 2 second long pulse.

The Windows COM Port Redirector

In addition to being able to access the EnOcean Com-Server data through the OPC port, the Windows Com-Port Redirector gives you direct access to the data which the EnOcean RF module integrated into the Com-Server provides. The COM ports provide the raw data from the RF module without any pre-processing however, so that interpretation of the EnOcean protocol has to be handled by the respective application.

Detailed information about the EnOcean protocol can be found in the manual for the EnOcean Transceiver Module TCM120, which EnOcean makes available on its Web site at www.EnOcean.com.

When you use the COM-Port Redirector for Windows 9x, NT, 2000 and XP, virtual COM ports are installed in the respective system. These behave just like normal local ports with respect to a serial application, but they represent the RF module port of the EnOcean Com-Server located in the network.

Use of the COM-Port Redirector in conjunction with EnOcean Com-Servers is free and not subject to any licensing.

Where to I obtain a COM-Port Redirector?

You can find the latest version of the COM-Port Redirector as well as additional tools, application descriptions and FAQs at our Web site:

<http://www.wut.de>

From there use the menu tree on the left side of the page. The path *Products & Downloads* → *Com-Server* takes you to the menu branch containing a direct link to the COM-Port Redirector.

Settings on the EnOcean Com-Server

All the EnOcean Com-Server needs to operate with the COM-Port Redirector are the 3 network-specific parameters IP address, subnet mask and gateway address. The serial transmission parameters such as baud rate are determined by the serial

application and sent by the COM-Port Redirector over the network to the EnOcean Com-Server.

Here it is absolutely necessary to set *9600 baud, 8 data bits, 1 stop bit, no parity and no handshake*.

Installing and configuring the COM-Port Redirector

Installation and configuration of the COM-Port Redirector are described in the respective online help.

Firmware update for the EnOcean Com-Server

The operating software of the EnOcean Com-Server is subject to continuous enhancement. The following section describes how to perform an upload of the firmware to the EnOcean Com-Server.

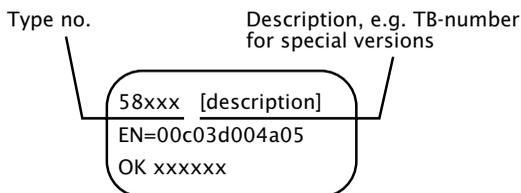
Where can I get the current firmware?

The most current firmware including the available update tools and a revision history is published on our Web site at:

<http://www.wut.de>

From the window *Insider search by article no.* below the menu tree enter the article number of the EnOcean Com-Server and set the selection window below it to *Firmware*. Click on *Go* to get to the most current firmware for the EnOcean Com-Server.

If you do not know the article number, you can find it on the sticker located on the narrow side of the housing, which also indicates the Ethernet address.



Firmware update

You must have a PC running under Windows 9x/NT/2000/XP with a network connection and activated TCP/IP stack. For the update process you will need WuTility and the update file (*.uhd), which as described above can be downloaded from the W&T Web site at <http://www.wut.de>.

No special preparation of the EnOcean Com-Server is necessary for the firmware update. Simply ensure that all data, controller and configuration connections are closed.

Click on the *Firmware* button to go to the next window where you can select the desired update file. After confirming your entry with *Continue*, the update procedure of the EnOcean Com-Server begins.

Never intentionally interrupt the update process by pulling the network plug or pressing the Reset key. After an incomplete update the EnOcean Com-Server will not be functional.

Hardware reset to factory defaults

In addition to using WuTility or the telnet configuration (Port 1111) to reset the EnOcean Com-Server to its factory defaults, you can also perform a hardware reset: All models have two jumpers located directly next to each other on the circuit board. For normal operation these must be open. To restore the factory defaults, proceed as follows:

- Turn off or disconnect power from the EnOcean Com-Server and open the housing. Carefully pulling on the threaded-in antenna plug while pressing on the long sides of the housing allows the board to be pulled out of the housing.
- Close *both* jumpers and restore power. An internal self-test lasting approx. 20 seconds will follow.
- After approx. 20 seconds the self-test will finish and the factory default settings are restored.
- Turn off power to the EnOcean Com-Server, open both jumpers and close up the housing.



Resetting the non-volatile memory will result in loss of all the settings which are different from the default values, including the IP address. The setting profile for the factory defaults can if necessary be replaced with a custom profile. In this case the custom settings are activated after the reset.

Technical Data

Network interface:	10/100BT autosensing
RF interface:	EnOcean Transceiver-Interface with SMA terminal for antenna
Frequency:	868.3 MHz
Transmitting power:	10mW
Antenna	External, freely positionable antenna
Range:	typ. 300m outdoors typ. 30m indoors
Number of transmitters:	Any number of transmitters can be received
Number of receivers:	max. 128 receiver groups per EnOcean Com-Server
Galvanic isolation:	min. 500 Volt between network and supply
Software interfaces:	OPC-Server Windows-COM-Port Redirector TCP and UDP sockets, Client and server on request
Supply voltage:	DC: 12V (-10%) .. 48V (+10%) AC: 9Veff (-10%) .. 30Veff (+10%)
Current draw:	typ. 70mA @24V DC
Ambient temperature:	Storage: -40..+70°C Operating: Non-rowed installation: 0..+60°C Rowed installation: 0..+50°C
Housing:	Plastic compact housing, 105x75x22mm
Weight:	approx. 450 g
Scope of delivery:	EnOcean Com-Server External antenna with 2m cable Plug-in power supply for office use

Declaration of Conformity



Declaration of Conformity

We, **Wiesemann & Theis GmbH, Porschestra. 12, 42279 Wuppertal**

hereby declare that the product

EnOcean Com-Server, Type 59610

to which this declaration relates is in conformity with the essential provisions of the EC Council Directives

1. 89/336/EEC Electromagnetic Compatibility Directive (EMC)
2. 73/23/EEC, resp. 93/68/EEC Low Voltage Directive (LVD)
3. 1999/5/EC Radio Equipment and Telecommunications Terminal Equipment Directive (R&TTE)

in compliance with the following standards:

Emission according to ETS EN301489-3 (V.1.4.1):

- 1.1. EN 55022-B
- 1.2. EN 61000-3-2
- 1.3. EN 61000-3-3

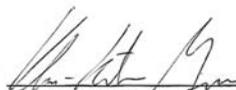
Immunity according to ETS EN301489-3 (V.1.4.1):

- 1.4. EN 61000-4-2/95 + A1,2
- 1.5. EN 61000-4-3/2002
- 1.6. EN 61000-4-4/95+A1,2
- 1.7. EN 61000-4-5/95+A1
- 1.8. EN 61000-4-6/95+A1
- 1.9. EN 61000-4-11/94+A1

2.1. EN 60950 (2003)

- 3.1. EN 50371 (2002)
- 3.2. EN 300220-3 (V.1.1.1)

Wuppertal, 04/08/2005


 Klaus Meyer, EMC-Representative


 Dipl.-Ing. Rüdiger Theis, Managing Director

Interfaces
für
Netzwerke,



serielle
Schritt-
stellen



und
Drucker-
schritt-
stellen



