Expert Sensor Box 7211/7212

Have your Gude devices always in view - and in control.

With the free Gude Control App you can retrieve all relevant information from your GUDE products regardless of their current whereabouts. Check with your smartphone the important operating figures of your server and rack environment like sensor values (max/min), energy consumption as well as state of inputs and outputs with watchdog functions. In particular, connected consumers can be switched remotely with Gude Control.

"Gude Control" is available for the Expert Power Control 8220/8225 series and can be free downloaded from the Google Play Store and iTunes Store.
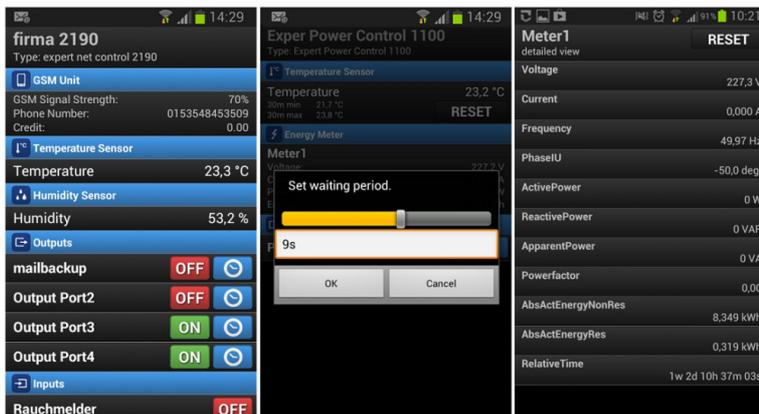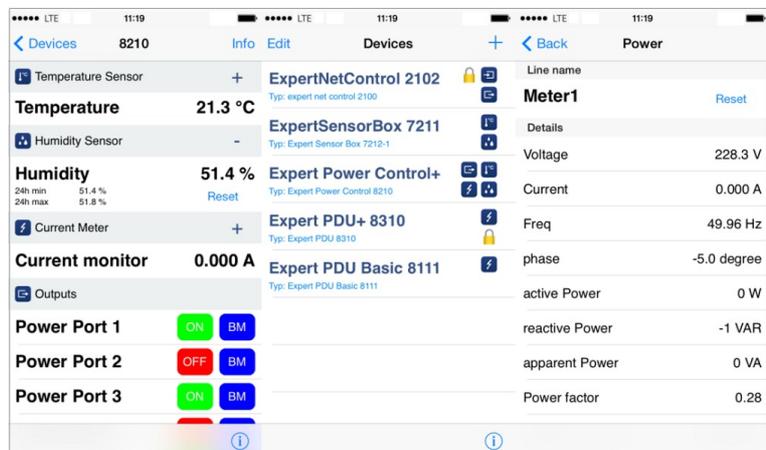
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1   Device Description

1.1   Security Advice

- The device must be installed only by qualified personnel according to the following installation and operating instructions.
- The manufacturer does not accept responsibility in case of improper use of the device and particularly any use of equipment that may cause personal injury or material damage.
- The device contains no user-maintenable parts. All maintenance has to be performed by factory trained service personnel.
- The device may only be connected by a low voltage power supply (12V) to 230V AC (50Hz or 60Hz).
- Always connect the device to properly grounded power sockets. To connect a Power-over-Ethernet device, use only certified and CE marked hardware.
- The device is intended for indoor use only. Do NOT install them in an area where excessive moisture or heat is present.
- Because of safety and approval issues it is not allowed to modify the device without our permission.
- Please note the safety advises and manuals of connected devices, too.
- The device is NOT a toy. It has to be used or stored out or range of children.
- Care about packaging material. Plastics has to be stored out of range of children. Please recycle the packaging materials.
- In case of further questions, about installation, operation or usage of the device, which are not clear after reading the manual, please do not hesitate to ask our support team.
- Please, never leave connected equipment unattended, that can cause damage.

1.2   Content of Delivery

The package includes:
- expert sensor box 7211/7212
- CD-ROM and manual
- Integrated P-o-E power supply (Model 7211-0 or 7212-0)
- 500mA AC adaptor (Model 7211-1 or 7212-1)

1.3   Description

The sensor box 7211/7212 is a temperature sensor (7211), or a hybrid sensor (7212 - thermometer and hygrometer) that can be connected to an Ethernet network. Integrated in the device is a Web server and an SNMP server, which allow remote access to sensor readings. Depending on adjustable limits of temperature and humidity the transfer of syslog messages, emails and SNMP traps can be enabled.

1.4   Installation

Connectors on the expert sensor box 7211/7212

1. Status LED
2. Bootloader Button
3. Ethernet Port (RJ45)
4. Connector for AC Adaptor (12V DC, 0,5A)

The AC adaptor connnector is only built-in at the models 7211-1 and 7212-1.

1.5   Status LED

The Status LED shows different states of the device:

*   red: Device is not connected to the Ethernet
*   orange: Device is connected to the Ethernet, TCP/IP settings are not allocated
*   green: Device is connected to the Ethernet, TCP/IP settings allocated
*   periodic blinking: Device is in Bootloader mode.

1.6   Bootloader Mode

Certain actions can, for safety reasons, only be carried out if the device is in bootloader mode. The following operations are possible only in Bootloader Mode:

*   Firmware Update
*   Configuration with GBL_Conf.exe
*   Factory Reset

Activation of the Bootloader Mode

via push button:

*   Hold both buttons for 3 seconds (only if the device has 2 buttons)

or

- Remove the power supply
- Hold down the button (or the "Select" button for devices with 2 buttons). If the push button is recessed, use a pin or paper clip
- Connect the operating voltage

by Software: (only if "Enable FW to BL" was previously activated in GBL_Conf.exe)

- Start GBL_Conf.exe
- Do a network search with the *"Search"* menu action
- Activate in menu *"Program Device"* the item *"Enter Bootloader"*

Whether the device is in bootloader mode, is indicated by the flashing of the status LED, or it is shown in GBL_Conf.exe, after a renewed device search, with the appendix "BOOT-LDR" after the device name. In bootloader mode the program GBL_Conf.exe can disable the password and the IP ACL, perform a firmware update, and restore the factory settings.

Activation of the bootloader mode and an abandonment of the bootloader does not change the state of the power or output ports as long as the supply voltage is maintained.

Abandonment of the Bootloader Mode

via push button:

- Hold both buttons for 3 seconds (only if the device has 2 buttons)

or

- Remove and connect the power supply without operating a button

by Software:

- Start GBL_Conf.exe
- Do a network search with the *"Search"* menu action
- In menu *"Program Device"* activate the item *"Enter Firmware"*

Factory Reset

If the device is in bootloader mode, it can always be put back to its factory default. All TCP / IP settings are reset in this operation.

via push button:

- Activate the Bootloader Mode of the device
- Hold down the button (or the "Select" button for devices with 2 buttons) for 6 seconds. If the push button is recessed, use a pin or paper clip
- The status LED will blink in a fast rhythm, please wait until the LED blinks slowly (about 5 seconds)

by Software:

- Activate the Bootloader Mode of the device
  - Start GBL_Conf.exe
- In menu *"Program Device"* activate the item *"Reset to Fab Settings"*
- The status LED will blink in a fast rhythm, please wait until the LED blinks slowly (about 5 seconds)

1.7   Firmware-Update

To perform a firmware update, the program GBL_Conf.exe and the latest firmware is needed.

Enable the bootloader mode (see Chapter Bootloader Mode)
Start GBL_Conf.exe
Select the device for which a firmware update is to be performed
Click "Program Device" and then select there "Firmware Update"
Specify the firmware file that should be uploaded

Upon completion of the update process, please start the new firmware of the device. You can do this by simply leaving the bootloader mode.

A firmware update, unlike other functions, is not sent as a network broadcast. Therefore, the device must have a valid IP address and a valid netmask before the firmware update. If necessary, please correct the entries in GBL_Conf.exe in bootloader mode and save them with *"Save Config"*.

If after a firmware update, the web page is not displayed correctly anymore, this may be related to the interaction of Javascript with an outdated browser cache. Not always helps a Ctrl-F5, it is recommended that you manually delete the cache in the browser options. Alternatively, you can test start the browser in "private mode".

1.8   Technical Specifications

Interfaces:	1 x Ethernet port (RJ45)
	1 x Connector for AC Adaptor
Network connectivity:	10/100 MBit/s 10baseT Ethernet
Protocols:	TCP/IP, HTTP, SNMP v1 und v2c,
	SNMP traps, Syslog, E-Mail (SMTP)
Power Supply:	AC Adaptor (12V DC, 0,5A)
Environment • Operating temperature: • Storage temperature: • Humidity:	 0°C - 50°C -15°C - 60°C 10% - 85%
Measurements:	90mm x 25mm x 63mm (L x H x W)
Weight:	approx. 100g

# 2   Configuration

TCP/IP configuration by DHCP

After switching on the device is scanning on the Ethernet for a DHCP server and requests an unused IP address. Check the IP address that has been assigned and adjust if necessary, that the same IP address is used at each restart. To turn off DHCP use the software GBL_Conf.exe or use the configuration via the web interface.

To check the network settings with GBL_Conf.exe, start the program and choose *"All Devices"* in the *"Search"* menu. From the list select the appropriate device. The lower part of the left half of the window

now shows the current network settings of the device. If the IP address is displayed with the default settings (192.168.0.2), either no DHCP server is present on the network, or there could be no free IP address assigned to it.

2.1   Configuration by Software

To view and change the network settings, you can use the program GBL_Conf.exe. The program is available for free on our website www.gude.info and is also available on the accompanying CD-ROM. You can also use GBL_Conf.exe to install firmware updates and trigger a reset to factory defaults.
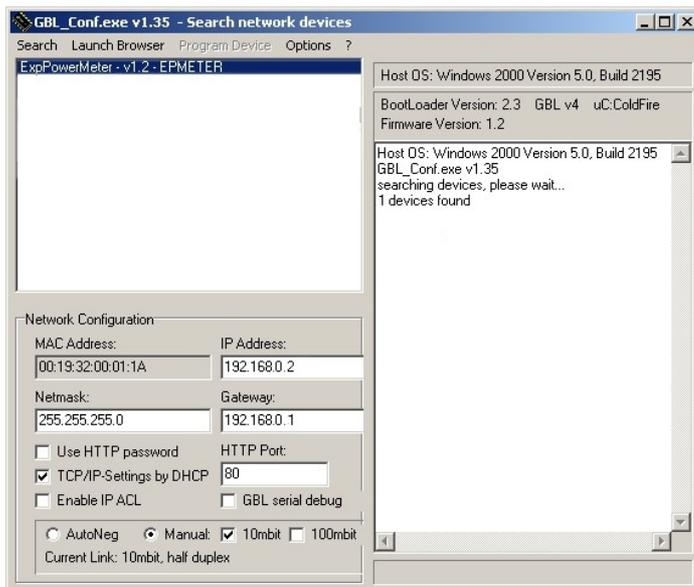
Interface GBL_Conf

To check the network settings with GBL_Conf.exe, start the program and choose *"All Devices"* in the *"Search"* menu. From the list select the appropriate device. The lower part of the left half of the window now shows the current network settings of the device. If the IP address is displayed with the default settings (192.168.0.2), either no DHCP server is present on the network, or there could be no free IP address assigned to it.

- Activate the Bootloader Mode (see Chapter Bootloader Mode) and choose in menu *"Search"* the item *"Bootloader-Mode Devices only"*
- Enter the desired settings in the edit window and save them with *"Save Config"*.
- Deactivate the boot loader mode for the changes to take effect. Select again *"All Devices"* in the *"Search"* menu of GBL_Conf.exe. The new network configuration is now displayed.

2.2   Configuration via Webinterface

Access the web interface: http://"IP-address" and log-in.

expert sensor box 7212-0 - v1.0.1

Use the "**Configuration**" Tab to enter the configuration menu.

2.2.1   Configuration - IP Address

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Hostname: Here you can enter a name with up to 15 characters. This name will be used for registration on the DHCP server. Special characters and umlauts can cause problems in the network.

IP Address: The IP address of the device.

Netmask: The network mask used in the network.

Gateway address: The IP address of the gateway.

Use DHCP: Select "yes" if the TCP/IP settings should be obtained directly from the DHCP server: When the function is selected, each time the device powers up it is checked if a DHCP server is available on the network. If not, the last used TCP/IP setting will be used further.

All IP changes will take effect directly, there is no need for a restart of the firmware.

2.2.2   Configuration - IP ACL

| Control Panel | **Configuration** | Logout |

IP Address · <u>IP ACL</u> · HTTP · Sensors · Alarm Beeper · SNMP · Syslog · E-Mail

Configuration - IP Access Control List

• Reply ICMP ping requests: ◉ yes ○ no

• Enable IP filter: ○ yes ◉ no

[Apply]

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<u>Reply ICMP ping requests</u>: If you enable this feature, the device responds to ICMP pings from the network.

<u>Enable IP filter</u>: Enable or disable the IP filter here. The IP filter represents an access control for incoming IP packets.

Please note that when IP access control is enabled DHCP and SNMP only work if the appropriate servers and clients are registered in the IP access control list.

IP Access Control List

The IP Access Control List (ACL IP) is a filter for incoming IP packets. If the filter is active, you can only connect to hosts and subnets whose IP addresses are entered in the list.

Examples:

Entry in the IP ACL	Meaning
192.168.0.123	the PC with IP Address „192.168.0.123" can access the device
192.168.0.1/24	all devices of subnet „192.168.0.1" can access

If you choose a wrong IP ACL setting and locked yourself out, please activate the Bootloader Mode and use GBL_Conf.exe to deactivate the IP ACL.

2.2.3   Configuration - HTTP

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HTTP port: Here can be set the port number of the internal HTTP. Possible values are from 1 to 65534 (default: 80). If you do not use the default port, you must append the port number to the address with a colon to address the device from a web browser. Such as: "http://192.168.0.2:800"

Enable auto refresh HTML: If this is activated, the information of the status page is automatically updated via http request (AJAX).

Require HTTP password: If desired, a http password protection can be enabled. In this case, an admin password and a user password can be assigned. The password can have up to 15 characters. User can log in by entering the user's password to query the status information and make changes to ports (if applicable). Admins have the privileges of a User and can change the Configuration settings. In the username field of the password input mask the names "admin" and "user" are supported. In the factory defaults the password for the admin is set to "admin" resp. "user" for the user password.

If you have forgotten your password, please activate the bootloader mode and then turn off the password prompt in GBL_Conf.exe.

2.2.4   Configuration - Sensors

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Choose sensor port: Selects a type of sensor to configure it. The first digit "1" indicates the number of the sensor port (only important for devices with more than one sensor port). This is followed by the sensor name (eg 7002 for the hybrid sensor), a letter for the sub-type sensor and the changeable sensor name. The sensor subtypes are defined as: "T" = temperature, "H" = humidity, "I" = sensor input.

Sensor Name: Changeable name for this sensor. Temperature and humidity can have different names, even if they are from the same sensor.

Generate messages: Enables the generation of messages.

Maximum/Minimum value: Here you can choose whether, and at what Maximum/Minimum temperature or humidity measurements limits the alerts are send via SNMP traps, syslog or email.

Hysteresis: This is the distance between the value that is signaling an overrun of a limit and the value that signals an underrun of the same limit.

Min/Max measurement period: Selects the time range for the sensor min / max values on the overview web page.

Hysteresis Example:

A Hysteresis value prevents that too much messages are generated, when a sensor value is jittering around a sensor limit. The following example shows the behavior for a temperature sensor and a hysteresis value of "1". An upper limit of "50 °C" is set.
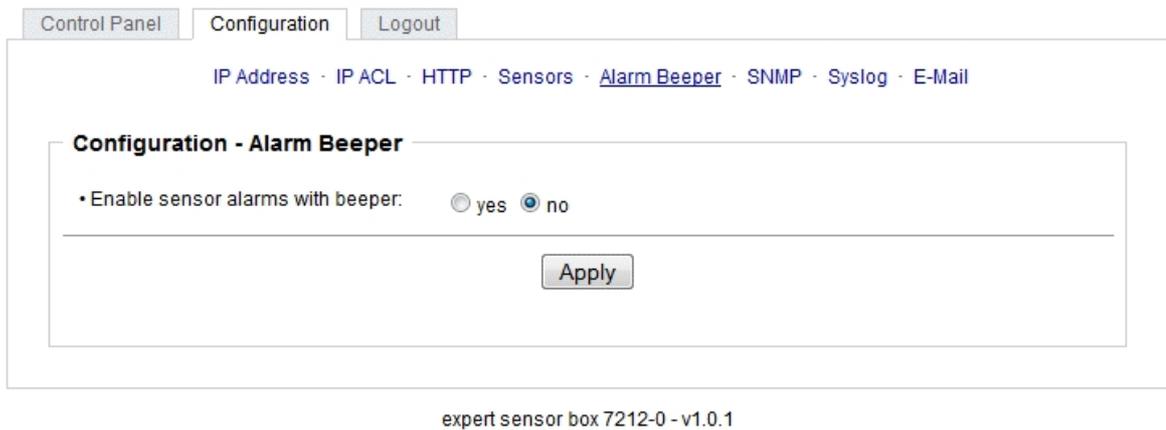
Example:

49.9 °C - is below the upper limit
50.0 °C - a message is generated for reaching the upper limit
50.1 °C - is above the upper limit
...

49.1 °C - is below the upper limit, but in the hysteresis range
49.0 °C - is below the upper limit, but in the hysteresis range
48.9 °C - a message is generated for underrunning the upper limit inclusive hysteresis range
...

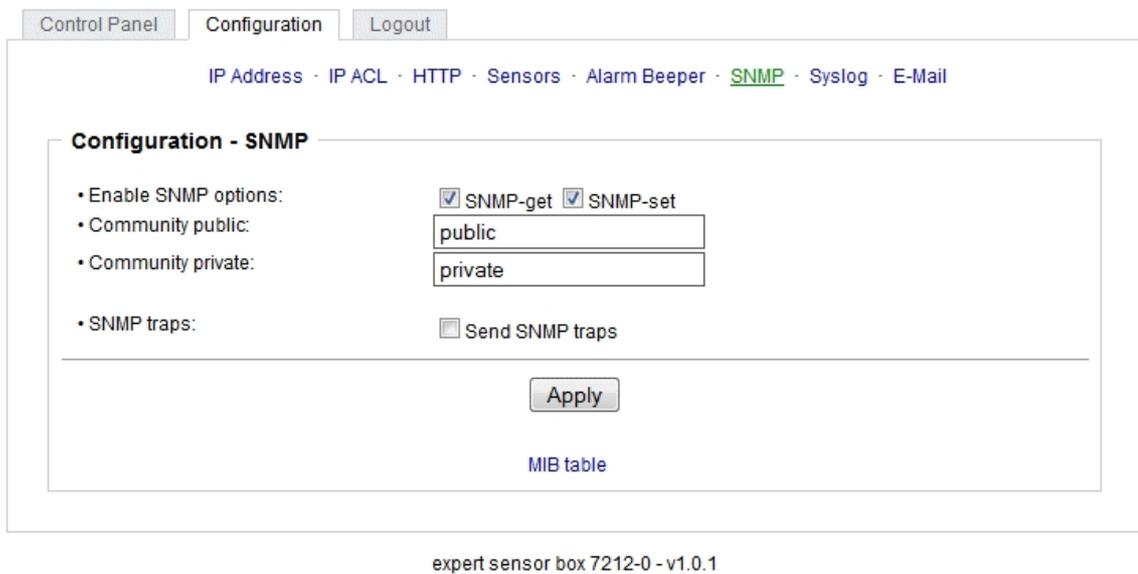### 2.2.5   Configuration - Alarm Beeper

Control Panel | Configuration | Logout

IP Address · IP ACL · HTTP · Sensors · Alarm Beeper · SNMP · Syslog · E-Mail

Configuration - Alarm Beeper

• Enable sensor alarms with beeper: ○ yes ● no

Apply

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Enable Beeper: The unit has an internal beeper, that can be enabled for audible alarms.

Ampere Limit: Enter the limit for the current at which the beeper is to be activated.

2.2.6   Configuration - SNMP

Control Panel | Configuration | Logout

IP Address · IP ACL · HTTP · Sensors · Alarm Beeper · SNMP · Syslog · E-Mail

Configuration - SNMP

• Enable SNMP options: ☑ SNMP-get ☑ SNMP-set
• Community public: public
• Community private: private

• SNMP traps: ☐ Send SNMP traps

Apply

MIB table

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SNMP-get: Enables the acceptance of SNMP-GET commands.

Community public: The community password for SNMP GET requests.

SNMP-set: Enables the acceptance of SNMP-SET commands.

Community private: The community password for SNMP SET requests.

MIB table: The download link to the text file with the MIB table for the device.

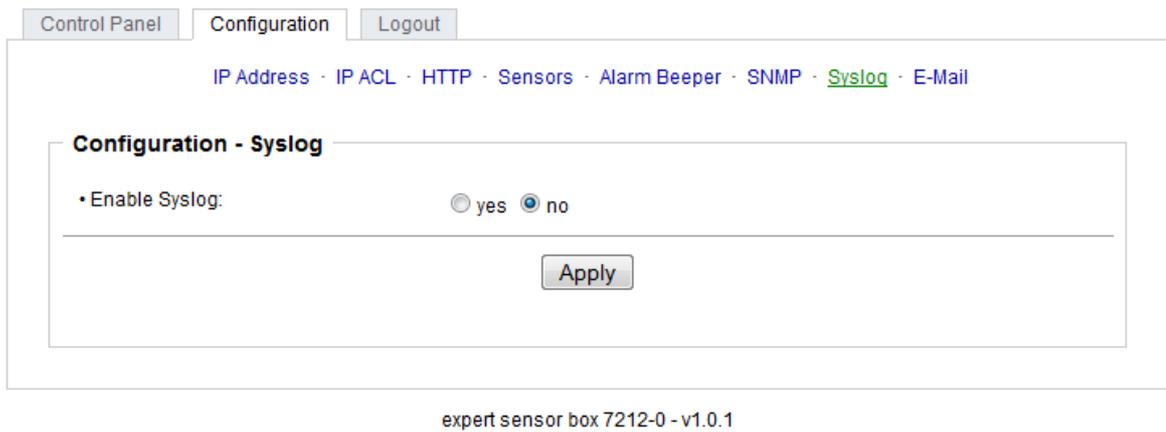Send SNMP traps: Activates the usage of SNMP traps.

SNMP v1: SNMP traps are sent in SNMP v1 format.

SNMP v2c: SNMP traps are sent in SNMP v2c format.

SNMP trap receiver: You can insert here up to eight SNMP trap receiver.

More information about SNMP settings are available from our support or can be found on the Internet at www.gude.info/wiki.

2.2.7   Configuration - Syslog

| Control Panel | Configuration | Logout |

IP Address · IP ACL · HTTP · Sensors · Alarm Beeper · SNMP · Syslog · E-Mail

Configuration - Syslog

• Enable Syslog: ○ yes ● no

[Apply]

expert sensor box 7212-0 - v1.0.1

Enable Syslog: Enables the usage of Syslog Messages.

Syslog Server: If you have enabled Syslog Messages, enter the IP address of the server to which the syslog information should be transmitted.

2.2.8   Configuration - E-Mail

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Currently, only SMTP servers are supported, that are offering no authentication (open-relay) or unencrypted authentication (PLAIN). An encrypted authentication to the SMTP server is not possible.

An experienced user can learn whether the desired SMTP server understands the PLAIN authentication, by sending the string "EHLO localhost" with Telnet to the server. Here's an example:

```
$ telnet smtp.1und1.com 25
Trying 212.227.15.129...
Connected to smtp.1und1.com.
Escape character is '^]'.
220 smtp.1und1.com (mreu3) Welcome to Nemesis ESMTP server
EHLO localhost                 <---- *TYPE* *THIS*
250-smtp.1und1.com
250-STARTTLS
250-AUTH LOGIN PLAIN           <---- *PLAIN* *SUPPORTED!*
250-AUTH=LOGIN PLAIN
250-SIZE 120000000
250 HELP
```

3   Protocols

3.1   SNMP

SNMP can be used to obtain status information via UDP (port 161). Supported SNMP commands are:

- GET
- GETNEXT
- GETBULK
- SET

To query via SNMP you need a Network Management System, such as HP OpenView, OpenNMS, Nagios, etc., or the command line tools of the Net-SNMP software.

SNMP-communities

SNMP authenticates requests by communities. A community is a string that acts like a password for a

read or a write SNMP access. Since these passwords are sent unencrypted and are easily intercepted with IP sniffers, it is recommended to use a safe network structure (DMZ) when security is required.

MIB

The values that can be read from the device or changed, the so-called "Managed Objects", are described in Management Information Bases (MIBs). The MIB table is build of substructures that are called OIDs (Object Identifiers). An OID number indicates the location of a value within the MIB tree. Each OID may alternatively be referred to with its symbol name (subtree name).

SNMP Traps

SNMP Traps are system messages that are sent via the SNMP protocol to different recipients. SNMP traps are triggered by the following events:

- Turning on the device
- Enable/disable of syslog in the configuration
- Exceeding of the max / min values of attached sensors

3.2   Syslog

Syslog messages are simple text messages that are sent via UDP to a syslog server. Under Linux, normally a syslog daemon is already running (eg. syslog-ng), for Microsoft Windows systems some freeware programs are available on the market. The syslog messages are sent for the following events:

- Turning on the device
- Enable/disable of syslog in the configuration
- Exceeding of the max / min values of attached sensors

4   Support

You will find the latest product software on our website at www.gude.info available for download. If you have further questions about installation or operation of the unit, please contact our support team. Furthermore, we present in our support wiki at www.gude.info/wiki FAQs and configuration examples.

4.1   Contact

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Fax: +49-221-912 90 98
E-Mail: mail@gude.info
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Managing Director: Dr.-Ing. Michael Gude

District Court: Köln, HRB-Nr. 17 7 84

WEEE-number: DE 58173350
Value added tax identification number (VAT): DE 122778228

4.2   Declarations of conformity

$C\epsilon$ # EG Konformitätserklärung
EC Declaration of Conformity

Der Hersteller   Gude Analog- und Digitalsysteme GmbH
The manufacturer   Eintrachtstr. 113
                         50668 Köln (Deutschland)

erklärt hiermit, dass die folgenden Produkte / hereby declares that the following products

Produktbezeichnung   Expert Sensor Box 7211-0
Product name   Expert Sensor Box 7211-1
                          Expert Sensor Box 7212-0
                          Expert Sensor Box 7212-1

Beschreibung   Sensoren zur Temperatur- und Luftfeuchtigkeitsmessungen mit Netzwerk-
Description   schnittstelle
                          Sensors for measurement of temperature and humidity with network inter-
                          face

**mit den Bestimmungen der nachstehenden EU-Richtlinien übereinstimmen / are in accor-
dance with the following European directives**

2004/108/EG   Elektromagnetische Verträglichkeit (EMV)
2004/108/EC   Electromagnetic Compatibility (EMC)

2011/65/EU   zur Beschränkung der Verwendung bestimmter gefährlicher Stoffe in Elek-
                         tro- und Elektronikgeräten (RoHS)
                         on the restriction of the use of certain hazardous substances in electrical and electronic
                         equipment (RoHS)

**und dass die nachstehenden harmonisierten Europäischen Normen zur Anwendung gelangt
sind. / and comply with the following harmonised European standards.**

EN 55022:2010/AC:2011 Einrichtungen der Informationstechnik - Funkstöreigenschaften - Grenzwerte und Mess-
                          verfahren / Information technology equipment - Radio disturbance characteristics - Limits
                          and methods of measurement

EN 55024:2010   Einrichtungen der Informationstechnik - Störfestigkeitseigenschaften - Grenzwerte und
                          Prüfverfahren / Information technology equipment - Immunity characteristics - Limits and
                          methods of measurement

EN 50581:2012   Technische Dokumentation zur Beurteilung von Elektro- und Elektronikgeräten hinsichtlich
                          der Beschränkung gefährlicher Stoffe / Technical documentation for the assessment of
                          electrical and electronic products with respect to the restriction of hazardous substan-
                          ces

Köln, 15.6.2015

Dr. Michael Gude, Geschäftsführer / General manager, CEO

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