Expert Power Control 8031 Series
Expert Power Control 8035 Series
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</table>
Device Description
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-maintainable parts. All maintenance has to be performed by factory trained service personnel.
- This device contains potentially hazardous voltages and should not be opened or disassembled.
- The device can be connected only to 100 - 240 V AC (50 - 60 Hz) power supply sockets.
- The used power cords, plugs and sockets have to be in good condition. Always connect the device to properly grounded power sockets.
- To disconnect the appliance quickly and safely from the power supply, the outlet supplying the appliance with power must be easily accessible.
- This equipment is designed for indoor use only. It must not be used in condensing or excessively hot environments.
- Please also observe the other instructions in the instructions for proper handling of the device.
- Because of safety and approval issues it is not allowed to modify the device without our permission.
- The device is NOT a toy. It has to be used or stored out of 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.
- Only connect electrical devices that do not have a limited duty cycle. This means that in the event of a fault, all connected electrical devices must be able to withstand continuous activation without causing damage.

1.2 Content of Delivery

The package includes:

- **Expert Power Control 8031/8035**
- 1 x Power Supply cable (IEC C19, max. 16 A)
- CD-ROM with Manual and Software tools

1.3 Description

The **Expert Power Control 8031/8035** can switch 8 load outputs (IEC C13, max. 10A), that are fed from a mains connection (IEC C20, max. 16A). The device has the following features:
• Switching of 8 load outputs.
• Energy measurement of the mains connection and measurement of voltage, current, active power, reactive power, apparent power, frequency, phase angle and power factor.
• 2 energy counters, one counter counts continuously, the other counter can be reset
• Residual current measurement type A
• Connection for 2 optional sensors for environmental monitoring (temperature, humidity and air pressure)
• A four-digit 7-segment LED display (for current display or data of external sensors).
• Energy measurement and energy counter for each of the 8 load outputs and measurement of voltage, current, active power, reactive power, apparent power, frequency, phase angle, power factor per output (see Feature Matrix).
• Separate overvoltage protection of the mains connection.
• Individually parameterisable switch-on delay of all load outputs.
• Individually adjustable watchdog for each load output, which switches depending on accessibility (network ping).
• Dual TCP/IP stack with IPv4 and IPv6 support (IPv6-ready).
• Control and monitoring of the device via Ethernet with an integrated web server with SSL encryption (TLS 1.0, 1.1, 1.2)
• SNMP (v1, v2c and v3, traps).
• Modbus TCP support.
• Radius support.
• Console control via Telnet and serial interface.
• Generation of messages (e-mail, syslog and SNMP traps) and switching of relays depending on energy measurement limits or external sensors.
• Firmware update during operation via Ethernet possible.
• Encrypted e-mails (SSL, STARTTLS).
• Access protection through IP access control
• Low own consumption
• Controllable via iOS and Android app Gude Control
• Developed and produced in Germany

Feature Matrix

<table>
<thead>
<tr>
<th>Product</th>
<th>Ports</th>
<th>Single Port Measurement</th>
<th>GSM</th>
<th>Connector</th>
</tr>
</thead>
<tbody>
<tr>
<td>8031-1</td>
<td>8</td>
<td></td>
<td></td>
<td>IEC</td>
</tr>
<tr>
<td>8031-2</td>
<td>8</td>
<td></td>
<td></td>
<td>IEC-Lock</td>
</tr>
<tr>
<td>8031-3</td>
<td>8</td>
<td></td>
<td></td>
<td>CEE 7-3</td>
</tr>
<tr>
<td>8035-1</td>
<td>8</td>
<td>x</td>
<td></td>
<td>IEC</td>
</tr>
<tr>
<td>8035-2</td>
<td>8</td>
<td>x</td>
<td></td>
<td>IEC-Lock</td>
</tr>
<tr>
<td>8035-3</td>
<td>8</td>
<td>x</td>
<td></td>
<td>CEE 7-3</td>
</tr>
</tbody>
</table>
### 1.4 Installation

1. 8 plain text displays (on/off) for the state of the outputs
2. LED indicator for Over Voltage Protection (red - surge protection is inactive)
3. Status LED
4. Current power consumption (7-segment display)

5. Select button
6. Ok button
7. Ethernet connector (RJ45)
8. External sensor connectors (RJ45)
9. RS232 connector

---

11. Mains supply (IEC C20, max. 16 A)
12. 8 x Load outputs (IEC C13, max. 16 A)
Device Description

13. Mains supply (IEC C20, max. 16 A)
14. 8 x Load outputs (IEC C13, max. 16 A, IEC-Lock)

Expert Power Control 8031/8035 - 3

15. Mains supply (IEC C20, max. 16 A)
16. %OUTLET_CNT%> x Load outputs (CEE 7-3, max. 10 A)

Start-up the device

- Connect the power cord (IEC C19, max. 16A) to the mains supply. The cable connectors are secured as regards their type against unintentional loosening. They must be inserted up to the stop, otherwise there is no secure connection. The plug must not wobble in the socket, or there is no tight connection.
- Plug the network cable into the Ethernet socket (RJ45).
- If required, setup a serial connection to the RS232 port.
- Insert the optional external sensors into the sensor connectors.
- Connect the consumers with the load outputs (IEC C13, max. 10A).

1.5 Overvoltage Protection

The device contains an overvoltage protection. The protection is based on input side varistors with thermal fuse between phase (L) and neutral (N) to protect the internal electronics and power ports with failure detection (permanently triggered thermal fuse). The state of the protection is indicated on the front panel by a red flash. An invisible flash means that the protection is active, a red flash symbolizes that the overvoltage protection fails. In addition, the status of the overvoltage protection can be seen on the Webpage (HTTP) and acquired with SNMP. Each surge protection module is designed that it can derive a practical unlimited number of voltage pulses in normal installation environments. In an environment with many energy rich surge pulses it can result in permanent loss of function due to aging of the overvoltage protection element.

⚠️ Recovering of the overvoltage protection function can only be performed by the manufacturer of the device. In the normal case, the device will continue to work even after the failure of the protective function.
A signaling via E-Mail, Syslog or SNMP trap occurs only once during operation, exactly at the moment in which the protection fails. In addition, at the start up of the device a message is generated, when the overvoltage protection is not active.

1.6  Technical Specifications

| Interfaces                                      | 1 x Ethernet port (RJ45) |
|                                                | 1 x Serial connector (D-SUB, RS232) |
|                                                | 2 x Mains supply (IEC C20, max. 16 A) |
|                                                | 8 x Load outputs (IEC C13, max. 16 A) |
|                                                | 2 x RJ45 for external sensor |
| Network connectivity                           | 10/100 MBit/s 10baseT Ethernet |
| Protocols                                      | TCP/IP, HTTP/HTTPS, SNMP v1/v2c/v3, SNMP traps, Syslog, E-Mail (SMTP) |
| Power Supply                                   | internal power supply (100-240 V AC / -15% / +10%, 50-60 Hz) |
| Overvoltage Protection                         | 20 mm / 250 J varistor disk (300V AC) |
| • single peak current for 20/80us pulse        | 10000 A |
| • max. clamping voltage 20/80us pulse, Ipk = 100 A | 775 V |
| Environment                                    | 0°C - 50 °C |
| • Operating temperature                        | -20°C - 70 °C |
| • Storage temperature                          | 0% - 95% (non-condensing) |
| • Humidity                                     | powder coated, galvanized steel sheet |
| Measurements                                   | 19” (inches), 1 Rack Unit, (Depth 195 mm) |
| Weight                                         | approx. 2.9 kg (8031) |
|                                                | approx. 3.0 kg (8035) |

1.6.1  Electrical Measurement

typical fault tolerances for Ta=25°C, I=1Arms...16Arms, Un=90Vrms...265Vrms
1.7 Sensor

Two external sensors can be connected to the Expert Power Control 8031/8035. The following sensors are currently available

Humidity/Temperature Sensor 7102 (End-of-Life)

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cable length</td>
<td>&amp;=gt; 2m</td>
</tr>
<tr>
<td>Connector</td>
<td>RJ45</td>
</tr>
<tr>
<td>Temperature range</td>
<td>-20°C to +80°C, ±0,5°C (maximum) and ±0,3°C (typical)</td>
</tr>
<tr>
<td>Air humidity range (non-condensing))</td>
<td>0-100%, ±3% (maximum) and ±2% (typical)</td>
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</table>
## Device Description

### Product Name

<table>
<thead>
<tr>
<th></th>
<th>7101</th>
<th>7104</th>
<th>7105</th>
<th>7106</th>
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<td>≈ 2m</td>
<td>≈ 2m</td>
<td>≈ 2m</td>
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<tr>
<td><strong>Connector</strong></td>
<td>RJ45</td>
<td>RJ45</td>
<td>RJ45</td>
<td>RJ45</td>
</tr>
<tr>
<td><strong>Temperature range</strong></td>
<td>-20°C to +80°C at ±2°C (maximum) and ±1°C (typical)</td>
<td>-20°C to +80°C at ±2°C (maximum) and ±1°C (typical)</td>
<td>-20°C to +80°C at ±2°C (maximum) and ±1°C (typical)</td>
<td>-20°C to +80°C at ±2°C (maximum) and ±1°C (typical)</td>
</tr>
<tr>
<td><strong>Air humidity range (non-condensing)</strong></td>
<td>-</td>
<td>-</td>
<td>0-100%, ±3% (maximum) and ±2% (typical)</td>
<td>0-100%, ±3% (maximum) and ±2% (typical)</td>
</tr>
<tr>
<td><strong>Air pressure range (full)</strong></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>± 1 hPa (typical) at 300 ... 1100 hPa, 0 ... +40 °C</td>
</tr>
<tr>
<td><strong>Air pressure range (ext)</strong></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>± 1.7 hPa (typical) at 300 ... 1100 hPa, -20 ... 0 °C</td>
</tr>
<tr>
<td><strong>Protection</strong></td>
<td>IP68</td>
<td>-</td>
<td>-</td>
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### Product Name

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<td><strong>Cable length</strong></td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Connector</strong></td>
<td>RJ45</td>
<td>RJ45</td>
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<tr>
<td><strong>Temperature range</strong></td>
<td>-20°C to +80°C at ±2°C (maximum) and ±1°C (typical)</td>
<td>-20°C to +80°C at ±2°C (maximum) and ±1°C (typical)</td>
</tr>
<tr>
<td><strong>Air humidity range (non-condensing)</strong></td>
<td>-</td>
<td>0-100%, ±3% (maximum) and ±2% (typical)</td>
</tr>
</tbody>
</table>
Device Description

The sensors are automatically detected after connect. This is indicated by the green LED on the sensor port that is lit permanently. The sensor values are displayed at the "Control Panel" web page:

<table>
<thead>
<tr>
<th>Id</th>
<th>Name</th>
<th>Temperature °C</th>
<th>Humidity %</th>
<th>Dew Point °C</th>
<th>Dew Diff °C</th>
<th>Pressure hPa</th>
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</thead>
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<tr>
<td>1</td>
<td>7106</td>
<td>22.5</td>
<td>94.2</td>
<td>5.9</td>
<td>16.6</td>
<td>1013.0</td>
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</table>

A click on the link in the "Name" column opens the display of the Min and Max values. The values in a column can be reset using the "Reset" button. The "Reset" button in the name column deletes all stored Min and Max values.

<table>
<thead>
<tr>
<th>Id</th>
<th>Name</th>
<th>Temperature °C</th>
<th>Humidity %</th>
<th>Dew Point °C</th>
<th>Dew Diff °C</th>
<th>Pressure hPa</th>
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<td>7106</td>
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<td>6.1</td>
<td>16.5</td>
<td>1016.0</td>
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<td></td>
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</tr>
</tbody>
</table>
Operating
2  Operating

2.1  Operating the device directly

Port Switching
The current status of the output is indicated by the color of the LED. Red indicates that the output is off, green shows that the output is on. On the device are the buttons "select" and "ok". If you press "select", the LED will blink for the first output, ie the output is selected. Press "select" again to select the next output. Hold down the button "ok" for two seconds, then the status of the selected output is toggled.

Display Information
If no port is selected manually, repeatedly pressing the "ok" button will show the IP-address and the values of the external sensors on the display.

Status-LED
The Status LED shows the different states of the device:

- red: The device is not connected to the Ethernet.
- orange: The device is connected to the Ethernet and waits for data from the DHCP server.
- green: The device is connected to the Ethernet and the TCP/IP settings are allocated.
- periodic blinking: The device is in Bootloader mode.

2.2  Control Panel

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

The web page provides an overview of the switching state, energy measurement values, as well as the external sensors, provided that they are connected. When a single port is clicked at the Expert Power Control 8031/8035, a panel with buttons to control a single port appears:

The Port icon is green when the relay is closed, or red in the open state. An additional small clock icon indicates that a timer is active. Timer can be activated by delay, reset or batch mode.

An activated Watchdog is represented by an eye icon. An "X" means, that the address that should be observed, could not be resolved. Two circular arrows show a booting status.

In addition to the panel, the Expert Power Control 8035 shows the measured values of the selected port:
Operating

The ports can be switched manually with the "On" and "Off" buttons. If the port is turned on, it can be turned off by pressing the "Reset" button, until after a delay it turns itself on again. The delay time is determined by the parameter Reset Duration, which is described in the chapter "Configuration - Power Ports". The "Close" button dissolves the panel again.

Batchmode

Each individual port can be set for a selectable period of time to the state "switch on" or "switch off". After the selected time they are automatically switched to the second preselected state.

Optional the device can be switched via a Perl script or external tools like wget. More information is available on our support wiki at www.gude.info/wiki.

2.3 Maintenance

The actual device generation with IPv6 and SSL allows all maintenance functions in the web interface to be carried out on the Maintenance Page.

Maintenance in the web interface

The following functions are available from the maintenance web page:

- Firmware Update
- Change the SSL certificate
- Load and save the configuration
- Restart the device
- Factory Reset
- Jump into the Bootloader
- Delete the DNS cache

Upload Firmware, Certificate or Configuration

On the Maintenance Page, select the required file with "Browse .." in the sections "Firmware Update", "SSL Certificate Upload" or "Config Import File Upload" and press "Upload". The file is now transferred to the update area of the device and the contents are checked. Only now, pressing the "Apply" button will permanently update the data, or abort with "Cancel".
Only one upload function can be initiated with a reboot, eg. you cannot transmit firmware and configuration at the same time.

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. If a Ctrl-F5 does not help, it is recommended that you manually delete the cache in the browser options. Alternatively, you can test start the browser in “private mode”.

During a firmware update, old data formats are sometimes converted to new structures. If an older firmware is newly installed, the configuration data and the energy meters may be lost! If the device then does not run correctly, please restore the factory settings (e.g. from the Maintenance Page [T3]).

**Actions in Bootloader mode**

If the web interface of the device is no longer accessible, the device can be put into Bootloader mode (see chapter Bootloader activation [T2]). The following functions can be executed using the GBL_Conf.exe application:

- Set IPv4 address, net-mask and gateway
- Turn HTTP password on and off
- Turn IP-ACL on and off
- Factory Reset
- Jump into the bootloader (can be switched on and off)
- Restart the device

For devices with relays, entering or exiting the bootloader mode does not change the state of the relays as long as the operating voltage is maintained.

The GBL_Conf.exe program is available free of charge on our website www.gude.info and can also be found on the enclosed CD-ROM.

**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.

**Factory Reset**

The device can be reset to the factory default via the web interface from the Maintenance Page or from the Bootloader mode (see chapter Bootloader activation). All TCP/IP settings are reset in this operation.

⚠️ If a unit is set to factory defaults, an uploaded certificate or updated firmware will be preserved.

### 2.3.1 Maintenance Page

This section provides access to important functions such as Firmware Update or Restart Device. It is advisable to set an HTTP password for this reason.

![Maintenance Page Screenshot]

**Firmware Update**: Start a firmware update.

**SSL Certificate Upload**: Saves your own SSL certificate. See chapter "SSL" for the generation of a certificate in the right format.

**Config Import File Upload**: Loads a new configuration from a text file. To apply the new configuration, a "Restart Device" must be executed after the "Upload".
Config File Export: Saves the current configuration in a text file.

⚠️ Saving the configuration should only be carried out in an SSL connection, since it contains sensitive password information (even if it is encrypted or hashed).

Restart Device: Restarts the device without changing the status of the relays.

⚠️ Some functions such as a firmware update or changing of the IP-address and HTTP settings require a restart of the device. A jump to the bootloader or a restart of the device lead by no means to a change of the relay states.

Restore Fab Settings and Restart Device: Performs a restart and resets the device to factory default.

Enter Bootloader Mode: Jumps into bootloader mode, where additional settings can be made with GBL_Conf.exe.

Flush DNS Cache: All entries in the DNS cache are discarded and address resolutions are requested again.

2.3.2 Configuration Management

The device configuration can be saved and restored in the maintenance area.

The "Config File Export" function can be used to save the current configuration as a text file. The syntax used in the configuration file corresponds to the commands of the Telnet console. If the configuration of a device is to be restored from a text file, load the file with "Upload" and restart the device with "Restart Device".

⚠️ Saving the configuration should only be carried out in an SSL connection, since it contains sensitive password information (even if it is encrypted or hashed). For the same reasons, it is advisable to carefully handle the generated configuration files when archiving.

Editing the configuration file

It is possible to customize a saved configuration file with a text editor for your own needs. For example, one scenario would be to use a script language to automate the creation of many customized versions of a configuration, then equip a large number of devices with an individualized configuration. Also Upload and restart with CGI commands can be done in scripting languages. With use of the comment sign "#" you can quickly hide single commands or add personal notes.

If you modify a configuration file manually, it is not always clear which limits are allowed for parameters. After uploading and restarting, commands with invalid parameters are ignored. Therefore, the generated configuration includes comments describing the boundaries of the parameters. Where "range:" refers to a numeric value, and "len:" to a text parameter. E.g:
email auth set 0 #range: 0..2
email user set "" #len: 0..100

The command "system fabsettings" from the beginning of a generated configuration file brings the device into the factory state, and then executes the individual commands that modify the configuration state. It may be desirable to make the changes relative to the current configuration, and not out of the factory state. Then the "system fabsettings" should be removed.

**No output of default values**

The configuration file contains (with exceptions) only values which differ from the default. The command "system fabsettings" (go to the factory state) from the beginning of a generated configuration file should not be removed, otherwise the device can get incompletely configured.

**Configuration via Telnet**

The configuration files can in principle also be transferred in a Telnet session, but then the settings are changed during operation, and not completely when restarting, as it would have been the case with an upload. It can happen that events are triggered at the same time as the device is configured. One should therefore:

- a) disable the function
- b) completely parametrize
- c) reactivate the function

An example:

```plaintext
email enabled set 0
email sender set "" #len: 0..100
email recipient set "" #len: 0..100
email server set "" #len: 0..100
email port set 25
email security set 0 #range: 0..2
email auth set 0 #range: 0..2
email user set "" #len: 0..100
email passwd hash set "" #len: 0..100
email enabled set 1 #range: 0..1
```

**2.3.3 Bootloader Activation**

The configuration of the device from the application "GBL_Conf.exe" is only possible, if the device is in Bootloader Mode.

**Activation of the Bootloader Mode**

1) via push button:
   - Hold both buttons for 3 seconds

2) or
   - Remove the power supply
   - Hold down the "Select" button. If the push button is recessed, use a pin or paper clip
   - Connect the operating voltage
3) by Software: (only if "Enable FW to BL" was previously activated in the "GBL_Conf.exe" application)

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

4) via web interface:

Press "Enter Bootloader Mode" on the maintenance web page.

Whether the device is in Bootloader mode, is indicated by the flashing of the status LED, or it is shown in "GBL_Conf.exe" application after a renewed device search (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.

⚠️ For devices with relays, entering or exiting the bootloader mode does not change the state of the relays as long as the operating voltage is maintained.

**Abandonment of the Bootloader Mode**

1) via push button:

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

2) or

- Remove and connect the power supply without operating a button

3) by Software:

- Start the "GBL_Conf.exe" application
- 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.

⚠️ If a unit is set to factory defaults, an uploaded certificate or updated firmware will be preserved.

1) 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)

2) by Software:

- Activate the Bootloader Mode of the device
- "Start the GBL_Conf.exe" program
- 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)
Configuration
3 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.

3.1 Power Ports

Choose Power Port to configure: This field is used to select the power ports to be configured.

Label: You can assign a name up to 15 characters for each of the power ports. Using the name, an identification of the device connected to the port can be facilitated.

Start-up Monitoring

It is important, that if necessary the condition of the power ports can be restored after a power failure. Therefore each port can be configured with Initialization status to a specific start-up state. This start-up sequence can be carried out delayed by the parameter Initialization Delay. There is in any case a minimum one-second delay between switching of ports.

Initialization status(coldstart): This is the port state (on, off, remember last state) the port should be set when the device is turned on. The setting "remember last state" saves the last manually set state of the power port in the EEPROM.

Initialization delay: Here can be configured how long the port should wait to switch to its defined state after the device is turned on. The delay may last up to 8191 seconds. This corresponds to a period of approx. two hours and 20 minutes. A value of zero means that the initialization is off.
Repower delay: When this feature is enabled (value greater than 0), the power port will switch itself on again a specified time after it has been disabled. Unlike the "Reset" button this function applies to all switch actions, including SNMP, or an optional serial interface.

Reset Duration: When the "Reset" button is triggered, the device turns the power port off, waits for the time entered here (in seconds) and turns the power port on.

3.1.1 Watchdog

The watchdog feature enables to monitor various remote devices. Therefore either ICMP pings or TCP pings are sent to the device to be monitored. If these pings are not answered within a certain time (both the time and the number of attempts can be set), the port is reset. This allows e.g. to automatically restart not responding server or NAS systems. The mode IP master-slave port allows you to switch a port depending on the availability of a remote device.

When a watchdog is activated it presents various information in the Control Panel. The information is color-coded.

- Green text: The watchdog is active and regularly receives ping replies.
- Orange text: The watchdog is currently enabled, and waits for the first Ping response.
- Red text: The watchdog is active and receives no ping replies anymore from the configured IP address.

After the watchdog has been enabled, the display remains orange until the watchdog receives a ping response for the first time. Only then the watchdog is activated. Even after triggering a watchdog and a subsequent power port reset, the display will remain orange until the device is rebooted and responds again to ping requests. This will prevent a premature watchdog reset of the port, e.g. when a server needs a long time for a file check.

You can monitor devices on your own network, as well as devices on an external network, e.g. the operating status of a router.

Enable watchdog: Enables the watchdog function for this Power Port.

Watchdog type: Here you can choose between the monitoring by ICMP pings or TCP pings.
• **ICMP Pings**: The classic ping (ICMP echo request). It can be used to check the accessibility of network devices (for example, a server).

• **TCP Pings**: With TCP pings, you can check if a TCP port on the target device would accept a TCP connect. Therefore a non-blocked TCP port should be selected. A good choice would be port 80 for http or port 25 for SMTP.

**TCP port**: Enter the TCP port to be monitored. When using ICMP pings this is not needed.

**Hostname**: The name or IP address of the monitored network device.

**Ping interval**: Select the frequency (in seconds) at which the ping packet is sent to each network device to check its operating status.

**Ping retries**: After this number of consecutive unanswered ping requests the device is considered inactive.

---

**Watchdog mode**: When Reset port when host down is enabled, the Power Port is turned off and switched back on after the time set in Reset Duration. In mode Switch off once when host down the Power Port remains disabled.

At the default setting (Infinite wait for booting host after reset) the watchdog monitors the connected device. When there is no longer a reply after a set time, the watchdog performs the specified action, usually a reset of the Power Port. Now the watchdog waits until the monitored device reports again on the network. This may take several minutes depending on the boot duration of the device. Only when the device is accessible from network again, the watchdog is re-armed. If the option Repeat reset on booting host after x ping timeout is enabled, this mechanism is bypassed. Now the watchdog is re-activated after N Ping intervals (input field ping timeouts).

When enabling the **IP master-slave mode**, the port is switched depending on the availability of a remote device. Depending on the configuration, the port is switched on when the terminal is reachable, or vice versa.

⚠️ The option Repeat reset on booting host after x ping timeout has the following pitfall: If a server, that is connected to the monitored Port is in need for a long boot process (e.g., it is doing a file system check), the server would probably exceed the tripping time of the watchdog. The server would be switched off and on again, and the file system check is restarted. This would be repeated endlessly.

### 3.2 Ethernet
3.2.1 IP Address

**Hostname**: Here you can enter a name with up to 63 characters. This name will be used for registration on the DHCP server.

⚠ Special characters and umlauts can cause problems in the network.

**IPv4 Address**: The IP address of the device.

**IPv4 Netmask**: The network mask used in the network.

**IPv4 Gateway address**: The IP address of the gateway.

**IPv4 DNS address**: The IP address of the DNS server.

**Use IPv4 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.

**Use IPv6 Protocol**: Activates IPv6 usage.

**Use IPv6 Router Advertisement**: The Router Advertisement communicates with the router to make global IPv6 addresses available.

**Use DHCP v6**: Requests from an existing DHCPv6 server addresses of the configured DNS server.

**Use manual IPv6 address settings**: Activates the entry of manual IPv6 addresses.

**IPv6 status**: Displays the IPv6 addresses over which the device can be accessed, and additionally DNS and router addresses.
For IP changes a firmware reset is required. This can be done in the Maintenance web page. A restart of the device leads by no means to a change of the relay states.

**Manual IPv6 Configuration**

The input fields for the manual setting of IPv6 addresses allow you to configure the prefix of four additional IPv6 device addresses, and to set two DNS addresses, and a gateway.

### 3.2.2 IP ACL

**Reply ICMP ping requests**: If you enable this feature, the device responds to ICMP pings from the network.
Enable IP filter: 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 HTTP and SNMP only work if the appropriate servers and clients are registered in the IP access control list.

⚠️ 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. Alternatively, you can reset the device to factory default.

### 3.2.3 HTTP

**HTTP Server option**: Selects whether access is possible only with HTTP, HTTPS, or both.

**Server port HTTP**: 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"

**Server port HTTPS**: The port number to connect the web server via the SSL (TLS) protocol.

**Enable Ajax autorefresh**: If this is activated, the information of the status page is automatically updated via http request (AJAX).

⚠️ For some HTTP configuration changes a firmware reset is required. This can be done in the Maintenance web page. A restart of the device leads by no means to a change of the relay states.
Enable password protection: Password access protection can be activated. If the admin password is assigned, you can only log in by entering this password to change settings. Users can log in by entering the user password in order to query the status information and initiate switching operations.

Use radius server passwords: Username and password are validated by a Radius Server.

Use locally stored passwords: Username and password are stored locally. In this case, an admin password and a user password must be assigned. The password can have a maximum of 31 characters. The name "admin" and "user" are provided for the user name in the password entry mask of the browser. In factory settings, the password for the admin is set to "admin" or "user" for the user password.

⚠️ If the password mask is redisplayed, only four "bullets" are shown as a symbolic placeholder, since for security reasons the device never stores the password itself, but only the SHA2-256 hash. If you want to change a password, the complete password must always be re-entered.

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

3.3 Protocols

3.3.1 Console

Enable Telnet: Enables Telnet console.
Telnet TCP port: Telnet sessions are accepted on this port.
Raw mode: The VT100 editing and the IAC protocol are disabled.
Activate echo: The echo setting if not changed by IAC.
Active negotiation: The IAC negotiation is initiated by the server.
**Configuration**

**Require user login:** Username and password are required.

**Delay after 3 failed logins:** After 3 wrong entries of username or password, the next login attempt is delayed.

**Use radius server passwords:** Username and password are validated by a Radius Sever.

**Use locally stored passwords:** Username and password are stored locally.

---

**Serial console:** Enables the serial console.

**Raw mode:** The VT100 editing is disabled.

**Activate echo:** The echo setting.

**Enable binary KVM protocol:** Additionally activates the KVM protocol.

**Enable UTF8 support:** Enables character encoding in UTF8.

**Require user login:** Username and password are required.

**Delay after 3 failed logins:** After 3 wrong entries of username or password, the next login attempt is delayed.

**Use radius server passwords:** Username and password are validated by a Radius Sever.

**Use locally stored passwords:** Username and password are stored locally.
## 3.3.2 Syslog

**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.

## 3.3.3 SNMP

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

**SNMP-set:** Allows the reception of SNMP-SET commands.
**SNMP UDP Port**: Sets the UDP port where SNMP messages are received.

**Enable SNMP v2**: Activates SNMP v2.

⚠️ Because of security issues, it is advisable to use only SNMP v3, and to disable SNMP v2. Accesses to SNMP v2 are always insecure.

**Community public**: The community password for SNMP GET requests.

**Community private**: The community password for SNMP SET requests.

**Enable SNMP v3**: Activates SNMP v3.

**SNMP v3 Username**: The SNMP v3 User Name.

**SNMP v3 Authorization Algorithm**: The selected Authentication Algorithm.

**SNMP v3 Privacy Algorithm**: SNMP v3 Encryption Algorithm.

⚠️ If the password mask is redisplayed, only four "bullets" are shown as a symbolic placeholder, since for security reasons the device never stores the password itself, but only the key formed using the Authorization Algorithm. If you want to change a password, the complete password must always be re-entered.

⚠️ The calculation of the password hashes varies with the selected algorithms. If the Authentication or Privacy algorithms are changed, the passwords must be re-entered in the configuration dialog. "SHA-384" and "SHA512" are calculated purely in software. If "SHA-512" is set on the configuration page, the time for the key generation may take once up to approx. 45 seconds.

**Send SNMP traps**: Here you can specify whether, and in what format the device should send SNMP traps.

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

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

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

Enable Radius Client: Enables validation over Radius.

Use CHAP: Use CHAP password encoding.

Use Message Authentication: Adds the "Message Authentication" attribute to the Authentication Request.

Primary Server: Name or IP address of the Primary Radius server.

Shared secret: Radius Shared Secret.

Timeout: How long (in seconds) will be waited for a response from an Authentication Request.

Retries: How often an authentication request is repeated after a timeout.

Use Backup Server: Activates a Radius Backup server.

Backup Server: Name or IP address of the Radius Backup server.

Shared secret: Radius Shared Secret.

Timeout: How long (in seconds) will be waited for a response from an Authentication Request.

Retries: How often an authentication request is repeated after a timeout.
Configuration

Test Username: Username input field for Radius test.

Test Password: Password input field for Radius test.

The "Test Radius Server" function allows you to check whether a combination of Username and Password is accepted by the configured Radius Servers.

3.3.5 Modbus TCP

Enable Modbus TCP: Enables Modbus TCP support.

Modbus TCP port: The TCP/IP port number for Modbus TCP.

3.4 Clock
### 3.4.1 NTP

**Enable Time Synchronization:** Enables the NTP protocol.

**Primary NTP server:** IP address of the first NTP server.

**Backup NTP server:** IP address of the second NTP server. Used when the first NTP server does not respond.

**Timezone:** The set time zone for the local time.

**Daylight Saving Time:** If enabled, the local time is converted to Central European Summer Time.

- **set manually:** The user can set a time manually.
- **set to Browsertime:** Sets the time corresponding to web browser.

⚠️ If Time synchronization is enabled, a manual time will be overwritten at the next NTP synchronization.

---

<table>
<thead>
<tr>
<th>Enable Time Synchronization</th>
<th>Primary NTP server</th>
<th>Backup NTP server</th>
</tr>
</thead>
<tbody>
<tr>
<td>yes</td>
<td>0.pool.ntp.org</td>
<td>1.pool.ntp.org</td>
</tr>
</tbody>
</table>

---

**Current Systemtime (UTC):** 15:50:54 19.02.2019 (1556591454)
**Current Localtime:** 16:50:54 19.02.2019
**Browsertime:** 16:50:54 19.02.2019

**Set clock:**
- set manually
- set to Browsertime
3.4.2 Timer

**Enable Timer**: Enables or disables all timers globally.

**Syslog verbosity level**: Sets the verbosity level for timer syslog output.

**New Rule simple Timer**: Shows a dialog for a simple timer rule.

**New Rule advanced Timer**: Brings up the dialog for complex timer settings.

3.4.3 Timer Konfiguration

There are three possibilities in the timer configuration: Create a simple timer, add a complex timer, or change an existing configuration.

Timer rules are only executed if the device has a valid time. See Configuration NTP [1].
When "New Rule: simple Timer" is activated, the following dialog is displayed:

Here you set which port is to be switched for which period and on which weekdays the rule is active. In this example the period 9:00 to 17:00 is changed to 9:30 to 11:00 compared to the default input mask. This rule is also not applied to Saturdays and Sundays. The now existing rule says that on every day, except Saturday and Sunday, port 1 is switched on at 9:30 a.m. and switched off after 1.5 hours. A click on "Save" saves this rule.

Creating a Complex Timer

If you create a complex timer or change an already existing timer, an extended dialog is always shown:

Here you can see the extended representation of the simple timer from the previous example. The action is started every day of every month at 9:30. The weekdays Saturday and Sunday are excluded. An existing rule can be removed with the "Delete" button.

If a rule is deleted, the following rules move up. The numbering of the subsequent rules also changes by one. This also applies to the index in the console commands.
A simple timer is directly "enabled", on a new complex timer the "enable trigger" option must be switched on manually. You can set a probability and a scatter for the timer rules. Here the rule is executed with 100% probability. A jitter of 0 means that the action takes place exactly at the programmed time. As an action mode a ports can be switched, alternatively a console command (CLI Cmd) can be executed.

On the "Action PortSwitch" tab the switching function can be set in more detail. Port 1 is switched on and switched off again after 1.5 hours.

**Extending a Rule**

For demonstration purposes, the simple timer from the previous example is extended here:
The action will now not only start at 9:30, but also at 17:30. There are more changes: The timer is only active between October and December, also the action does not take place on the first day of a month.

⚠️ Since all fields in the mask are always taken into account, it is not possible to define the times 9:30 and 17:10 in a single timer rule. You need a second rule for this. If you set hours 9 and 17, as well as minutes 10 and 30, then the four times 9:10, 9:30, 17:10 and 17:30 would be programmed.

⚠️ In order to change a field in this input mask without changing the state of the other fields, the Ctrl key must be pressed during the mouse click.

With this rule, the time period in the "Options" tab is limited to the period between December 5, 2018 and July 4, 2019. In this example, the timer rule is executed with a random trigger probability of 90%.
In addition to port 1, port 5 is activated here and deactivated again after 90 minutes.

⚠️ A popup at the mouse pointer shows the port number of the corresponding field.

**Console Commands**

Instead of switching a port, you can run one or more console commands. These commands are entered in the "Action CLI" tab. The "Action Cli" tab can only be selected if the option "Perform CLI Cmd" is activated under "Options".

**Example Switching a Port on a Date**

If you want to switch on a timer on a certain date at a time and switch it off at a later time, you cannot do it directly with a simple timer. Therefore it can be useful to first create the timer as a simple timer and then adjust it in the extended dialog.
Configuration

Switches port 3 on every day at 9:25, and off again at 17:30. Save the simple rule.

Example rolling shutter

You can use the jitter e.g. for a roller shutter control. In the classic example of a roller shutter control, in order to confuse potential burglars, you do not always want to raise and lower the blinds at the same times. A jitter of 1800 seconds means that the action is performed randomly between 30 minutes before and 30 minutes after the programmed time. The probability (Random Trigger Probability) of the execution is here...
3.5 Sensors

Sensor: 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, and the changeable sensor name.

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

Select Sensor Field: Selects a data channel from a sensor.

Enable ... Messages: Enables the generation of sensor 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 E-Mail.

Hysteresis: This describes the margin of when an event is generated after the measured value has crossed the chosen limit.

Message channels: Enables the generation of messages on different channels.

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

Enable beeper for AC alarms: Activates the beeper for all AC limit messages.
**Enable beeper for sensor alarms:** Activates the beeper for all sensor limit messages.

**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
  
  ...

**3.5.1 Port Switching**

Depending on the measured Current and the measured sensor values, switching actions can be triggered. During operation, the actions configured for crossing the limits are executed. For example, when a value moves from the range "above max value" inside the range "below max value", the action defined for "below max value" is performed. In the case of device start, configuration or plug-in of the sensor, the actions corresponding to the range in which the current temperature is located are switched.

Example with "Maximum value" of 65 °C, "Minimum value" of 25 °C and hysteresis of 3 °C. The dotted line shows the hysteresis.

![Temperature Diagram](image-url)
Actions during configuration, device start or plugging in the sensor (for given example):

<table>
<thead>
<tr>
<th>actual temperature during configuration</th>
<th>actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>70 °C</td>
<td>Port A1 Off (above max) + Port A2 On (above min)</td>
</tr>
<tr>
<td>45 °C</td>
<td>Port A1 On (below max) + Port A2 On (above min)</td>
</tr>
<tr>
<td>20 °C</td>
<td>Port A1 On (below max) + Port A2 Off (below min)</td>
</tr>
</tbody>
</table>

Action matrix during operation when limit values are exceeded (for given example):

<table>
<thead>
<tr>
<th>from &quot;above max&quot;</th>
<th>to &quot;above max&quot;</th>
<th>to &quot;below max&quot;</th>
<th>to &quot;above min&quot;</th>
<th>to &quot;below min&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1 Off</td>
<td>A1 Off</td>
<td>-</td>
<td>-</td>
<td>A2 Off</td>
</tr>
<tr>
<td>A1 Off + A2 On</td>
<td>A2 On</td>
<td>A2 On</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Only the switching operations for which actions have been defined, are triggered. If no "On" or "Off" action is defined for a port, the port can never reach this state by exceeding sensor values. Unless it is the initial state.

3.6 E-Mail

Enable E-Mail: Activates the E-Mail dispatch of messages.

Sender address: The E-Mail address of the sender.
Configuration

Recipient address: The E-Mail address of the recipient. Additional E-Mail addresses, separated by comma, can be specified. The input limit is 100 characters.

SMTP Server: The SMTP IP-address of the E-Mail server. Either as FQDN, e.g: "mail.gmx.net", or as IP-address, e.g: "213.165.64.20". If required, attach a designated port, e.g: "mail.gmx.net:25".

SMTP server port: The port address of the E-Mail server. In the normal case this should be the same as the default, that is determined by the setting SMTP Connection Security.

SMTP Connection Security: Transmission via SSL or no encryption.


Username: User name that is registered with the SMTP E-Mail server.

Set new password: Enter the password for the login to the E-Mail server.

Repeat password: Enter the password again to confirm it.

⚠️ If the password mask is redisplayed, only four "bullets" are shown as a symbolic placeholder, since for security reasons the password is never shown itself. If you want to change a password, the complete password must always be re-entered.

E-Mail Logs: Logging of E-Mail system messages.

3.7 Front Panel

Button Lock: Disables the front buttons (activates the key lock) with the exception of the bootloader activation.

Dark Display: The 7-segment display remains dark. Front button activity temporarily switches the display on.

Default Display: Selects what sensor is displayed in the display.
Specifications
4 Specifications

4.1 IP ACL

IP Access Control List

The IP Access Control List (ACL IP) is a filter for incoming IP packets. If the filter is active, only the hosts and subnets whose IP addresses are registered in the list, can contact via HTTP or SNMP, and make changes. For incoming connections from unauthorized PCs, the device is not completely transparent. Due to technical restraints, a TCP/IP connection will be accepted at first, but then rejected directly.

Examples:

<table>
<thead>
<tr>
<th>Entry in the IP ACL</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>192.168.0.123</td>
<td>the PC with IP Address &quot;192.168.0.123&quot; can access the device</td>
</tr>
<tr>
<td>192.168.0.1/24</td>
<td>all devices of subnet &quot;192.168.0.1/24&quot; can access the device</td>
</tr>
<tr>
<td>1234:4ef0:eec1:0::/64</td>
<td>all devices of subnet &quot;1234:4ef0:eec1:0::/64&quot; can access the device</td>
</tr>
</tbody>
</table>

⚠️ 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. Alternatively, you can reset the device to factory default.

4.2 IPv6

IPv6 Addresses

IPv6 addresses are 128 bit long and thus four times as long as IPv4 addresses. The first 64 bit form a so-called prefix, the last 64 bit designate a unique interface identifier. The prefix is composed of a routing prefix and a subnet ID. An IPv6 network interface can be reached under several IP addresses. Usually this is the case under a global address and the link local address.

Address Notation

IPv6 addresses are noted in 8 hexadecimal blocks at 16 bit, while IPv4 normally is noted in decimal. The separator is a colon, not a period.

E.g.: 1234:4ef0:0:0:0019:32ff:fe00:0124

Leading zeros may be omitted within a block. The previous example can be rewritten as:

1234:4ef0:0:0:19:32ff:fe00:124

One may omit one or more successive blocks, if they consist of zeros. This may be done only once within an IPv6 address!

1234:4ef0::19:32ff:fe00:124
Specifications

One may use the usual decimal notation of IPv4 for the last 4 bytes:

1234:4ef0::19:32ff:254.0.1.36

4.3 Radius

The passwords for HTTP, telnet, and serial console (depending on the model) can be stored locally and/or authenticated via RADIUS. The RADIUS configuration supports a primary server and a backup server. If the primary server does respond, the RADIUS request is sent to the backup server. If the local password and RADIUS are enabled at the same time, the system is first checking locally, and then in the event of a failure the RADIUS servers are contacted.

RADIUS attributes

The following RADIUS attributes are evaluated by the client:

- **Session-Timeout**: This attribute specifies (in seconds) how long an accepted RADIUS request is valid. After this time has elapsed, the RADIUS server must be prompted again. If this attribute is not returned, the default timeout entry from the configuration is used instead.
- **Filter-Id**: If the value "admin" is set for this attribute, then an admin rights are assigned for the login, otherwise only user access.
- **Service-Type**: This is an alternative to Filter-Id. A service type of "6" or "7" means admin rights for the HTTP login, otherwise only limited user access.

HTTP Login

The HTTP login takes place via Basic Authentication. This means that it is the responsibility of the web server, how long the login credentials are temporarily stored there. The RADIUS parameter "Session-Timeout" therefore does not determine when the user has to login again, but at what intervals the RADIUS servers are asked again.

4.4 Automated Access

The device can be accessed automatically via four different interfaces, which offer different possibilities to access the configuration data and status information. Only http and the console (telnet and serial) provide full access to the device.

List of different access options (if supported by the model):

<table>
<thead>
<tr>
<th>Interface</th>
<th>Scope of Access</th>
</tr>
</thead>
<tbody>
<tr>
<td>HTTP</td>
<td>read / write all configuration data</td>
</tr>
<tr>
<td></td>
<td>read / write all status information</td>
</tr>
<tr>
<td>Console</td>
<td>read / write all configuration data</td>
</tr>
<tr>
<td></td>
<td>read / write all status information</td>
</tr>
<tr>
<td>SNMP</td>
<td>read / write status of Power Ports (relays)</td>
</tr>
<tr>
<td></td>
<td>read / write names of Power Ports (relays)</td>
</tr>
<tr>
<td></td>
<td>read / write status of Port start configuration</td>
</tr>
<tr>
<td></td>
<td>read / write status Buzzer</td>
</tr>
</tbody>
</table>
Specifications

| Modbus TCP | read / write status of Power Ports (relays)  
| read status of Inputs  
| read measurement values of external sensors  
| read measurement values of all energy sensors |

The device can be controlled via HTTP interface with CGI commands and returns the internal configuration and status in JSON format. The structure of the CGI commands and the JSON data is explained in more detail in our Wiki article: http://wiki.gude.info/EPC_HTTP_Interface

4.5 SNMP

SNMP can be used for 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 simple command line tools of NET-SNMP software. The device supports SNMP protocols v1, v2c and v3. If traps are enabled in the configuration, the device messages are sent as notifications (traps). SNMP Informs are not supported. SNMP Requests are answered with the same version with which they were sent. The version of the sent traps can be set in the configuration.

MIB Tables

The values that can be requested or changed by the device, the so-called "Managed Objects", are described in Management Information Bases (MIBs). These substructures are subordinate to so-called "OID" (Object Identifiers). An OID digit signifies the location of a value inside a MIB structure. Alternatively, each OID can be referred to with its symbol name (subtree name). The device's MIB table can be displayed as a text file by clicking on the link "MIB table" on the SNMP configuration page in the browser.

SNMP v1 and v2c

SNMP v1 and v2c authenticates the network requests by so-called communities. The SNMP request has to send along the so-called community public for queries (read access) and the community private for status changes (write access). The SNMP communities are read and write passwords. In SNMP v1 and v2 the communities are transmitted unencrypted on the network and can be easily intercepted with IP sniffers within this collision domain. To enforce limited access we recommend the use of DMZ or IP-ACL.

SNMP v3

Because the device has no multiuser management, only one user (default name
Specifications

"standard") is detected in SNMP v3. From the User-based Security Model (USM) MIB variables, there is a support of "usmStats ..." counter. The "usmUser ..." variables will be added with the enhancement of additional users in later firmware versions. The system has only one context. The system accepts the context "normal" or an empty context.

Authentication

The algorithms "HMAC-MD5-96" and "HMAC-SHA-96" are available for authentication. In addition, the "HMAC-SHA-2" variants (RFC7630) "SHA-256", "SHA-384" and "SHA-512" are implemented.

"SHA-384" and "SHA512" are calculated purely in software. If "SHA-384" or "SHA-512" is set on the configuration page, the time for the key generation may take once up to approx. 45 seconds.

Encryption

The methods "DES", "3DES", "AES-128", "AES-192" and "AES-256" are supported in combination with "HMAC-MD5-96" and "HMAC-SHA-96." For the "HMAC-SHA-2" protocols, there is currently neither RFC nor draft that will allow for cooperation with an encryption.

While in the settings "AES-192" and "AES256" the key calculation is based on "draft-blumenthalphoto-aes-usm-04", the methods "AES 192-3DESKey" and "AES 256-3DESKey" utilize a key generation, which is also used in the "3DES" configuration ("draft-reeder-snmpv3-usm-3desede-00"). If one is not an SNMP expert, it is recommended to try in each case the settings with and without "...- 3DESKey".

Passwords

The passwords for authentication and encryption are stored only as computed hashes for security reasons. Thus it is, if at all, very difficult to infer the initial password. However, the hash calculation changes with the set algorithms. If the authentication or privacy algorithms are changed, the passwords must be re-entered in the configuration dialog.

Security

The following aspects should be considered:

- If encryption or authentication is used, then SNMP v1 and v2c should be turned off. Otherwise the device could be accessed with it.
- If only authentication is used, then the new "HMAC-SHA-2" methods are superior to the MD5 or SHA-1 hashing algorithms. Since only SHA-256 is accelerated in hardware, and SHA-384 and SHA-512 are calculated purely in software, one should normally select SHA-256. From a cryptographic point of view, the security of SHA-256 is sufficient for today's usage.
- For SHA-1, there are a little less attack scenarios than MD5. If in doubt, SHA-1 is preferable.
- Encryption "DES" is considered very unsafe, use only in an emergency for reasons of compatibility!
- For cryptologists it's a debatable point whether "HMAC-MD5-96" and "HMAC-SHA-96" can muster enough entropy for key lengths of "AES-192" or "AES-256".
- From the foregoing considerations, we would recommended at present "HMAC-SHA-96" with "AES-128" as authentication and encryption method.

Change in Trap Design
In older MIB tables, a separate trap was defined for each combination of an event and a port number. This results in longer lists of trap definitions for the devices. For example, from `epc8221SwitchEvtPort1` to `epc8221SwitchEvtPort12`. Since new firmware versions can generate many more different events, this behavior quickly produces several hundred trap definitions. To limit this overabundance of trap definitions, the trap design has been changed to create only one specific trap for each event type. The port or sensor number is now available in the trap as an index OID within the variable bindings.

In order to recognize this change directly, the "Notification" area in the MIB table has been moved from `sysObjectID.0` to `sysObjectID.3`. This way, unidentified events are generated until the new MIB table is imported. For compatibility reasons, SNMP v1 traps are created in the same way as before.

### NET-SNMP

NET-SNMP provides a very widespread collection of SNMP command-line tools (snmpget, snmpset, snmpwalk etc.) NET-SNMP is among others available for Linux and Windows. After installing NET-SNMP you should create the device-specific MIB of the device in NET-SNMP share directory, e.g. after

```
c:\usr\share\snmp\mibs
```

or

```
/usr/share/snmp/mibs
```

So later you can use the 'subtree names' instead of OIDs:

**Name:** snmpwalk -v2c -mALL -c public 192.168.1.232 gudeads  
**OID:** snmpwalk -v2c -mALL -c public 192.168.1.232 1.3.6.1.4.1.28507

### NET-SNMP Examples

Query Power Port 1 switching state:

```
snmpget -v2c -mALL -c public 192.168.1.232 epc822XPortState.1
```

Switch on Power Port 1:

```
snmpset -v2c -mALL -c private 192.168.1.232 epc822XPortState.1 integer 1
```

### 4.5.1 Device MIB 8031

Below is a table of all device-specific OID's which can be accessed via SNMP. In the numerical representation of the OID the prefix "1.3.6.1.4.1.28507 " (Gude Enterprise OID) was omitted at each entry in the table to preserve space. The example for a complete OID would be "1.3.6.1.4.1.28507.81.1.1.1.1". A distinction is made in SNMP OID's in between tables and scalars. OID scalar have the extension ".0" and only specify a value. In SNMP tables the "x" is replaced by an index (1 or greater) to address a value from the table.

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>OID</th>
<th>Type</th>
<th>Acc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>epc8031TrapCtrl</td>
<td></td>
<td>.81.1.1.1.1.0</td>
<td>Integer32</td>
<td>RW</td>
</tr>
<tr>
<td></td>
<td>0 = off 1 = Ver. 1 2 = Ver. 2c 3 = Ver. 3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>epc8031TrapIPIndex</td>
<td></td>
<td>.81.1.1.2.1.1.x</td>
<td>Integer32</td>
<td>RO</td>
</tr>
</tbody>
</table>
## Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>epc8031TrapAddr</td>
<td>A unique value, greater than zero, for each receiver slot.</td>
</tr>
<tr>
<td>ep08031PortNumber</td>
<td>The number of Relay Ports.</td>
</tr>
<tr>
<td>epc8031PortIndex</td>
<td>A unique value, greater than zero, for each Relay Port.</td>
</tr>
<tr>
<td>epc8031PortName</td>
<td>A textual string containing name of a Relay Port.</td>
</tr>
<tr>
<td>epc8031PortState</td>
<td>Current state of a Relay Port.</td>
</tr>
<tr>
<td>epc8031PortSwitchCount</td>
<td>The total number of switch actions occurred on a Relay Port. Does not count switch commands which will not switch the relay state, so just real relay switches are displayed here.</td>
</tr>
<tr>
<td>epc8031PortStartupMode</td>
<td>Set Mode of startup sequence (off, on, remember last state)</td>
</tr>
<tr>
<td>epc8031PortStartupDelay</td>
<td>Delay in sec for startup action.</td>
</tr>
<tr>
<td>epc8031PortRepowerTime</td>
<td>Delay in sec for repower port after switching off.</td>
</tr>
<tr>
<td>epc8031Buzzer</td>
<td>Turn Buzzer on and off.</td>
</tr>
<tr>
<td>epc8031ActivePowerChan</td>
<td>Number of supported Power Channels.</td>
</tr>
<tr>
<td>epc8031PowerIndex</td>
<td>Index of Power Channel entries</td>
</tr>
<tr>
<td>epc8031ChanStatus</td>
<td>0 = data not active, 1 = data valid.</td>
</tr>
<tr>
<td>epc8031AbsEnergyActive</td>
<td>Absolute Active Energy counter.</td>
</tr>
<tr>
<td>epc8031PowerActive</td>
<td>Active Power</td>
</tr>
<tr>
<td>epc8031Current</td>
<td>Actual Current on Power Channel.</td>
</tr>
<tr>
<td>epc8031Voltage</td>
<td>Actual Voltage on Power Channel.</td>
</tr>
<tr>
<td>epc8031Frequency</td>
<td>Frequency of Power Channel.</td>
</tr>
<tr>
<td>epc8031PowerFactor</td>
<td>Power Factor of Channel between -1.0 and 1.00</td>
</tr>
<tr>
<td>epc8031Pangle</td>
<td>Phase Angle between Voltage and L Line Current between -180.0 and 180.0</td>
</tr>
<tr>
<td>epc8031PowerApparent</td>
<td>L Line Mean Apparent Power</td>
</tr>
<tr>
<td>epc8031PowerReactive</td>
<td>L Line Mean Reactive Power</td>
</tr>
<tr>
<td>epc8031AbsEnergyReactive</td>
<td>Absolute Reactive Energy counter.</td>
</tr>
<tr>
<td>epc8031AbsEnergyActiveResettable</td>
<td>Resettable Absolute Active Energy counter. Writing '0' resets all resettable counter.</td>
</tr>
<tr>
<td>epc8031AbsEnergyActiveResettable</td>
<td>Resettable Absolute Active Energy counter. Writing '0' resets all resettable counter.</td>
</tr>
<tr>
<td>epc8031ResetTime</td>
<td>Time in seconds since last Energy Counter reset.</td>
</tr>
<tr>
<td>epc8031ForwEnergyActive</td>
<td>Forward Active Energy counter.</td>
</tr>
<tr>
<td>epc8031ForwEnergyReactive</td>
<td>Forward Reactive Energy counter.</td>
</tr>
<tr>
<td>epc8031RevwEnergyActive</td>
<td>Reverse Active Energy counter.</td>
</tr>
<tr>
<td>epc8031RevwEnergyReactive</td>
<td>Reverse Reactive Energy counter.</td>
</tr>
</tbody>
</table>

**Note:** OCTETS = A unique value, greater than zero, for each receiver slot.
Specifications

epc8031RevEnergyReactiveReset-table .81.1.5.1.2.1.23.x Gauge32 RO
epc8031ResidualCurrent .81.1.5.1.2.1.24.x Unsigned32 RO
epc8031ResidualCurrentRMS .81.1.5.1.2.1.25.x Unsigned32 RO
epc8031ResidualCurrentDC .81.1.5.1.2.1.26.x Unsigned32 RO
epc8031LineSensorName .81.1.5.1.2.1.100.x OCTETS RW
epc8031OVPIndex .81.1.5.2.1.1.x Integer32 RO
epc8031OVPStatus .81.1.5.2.1.2.x INTEGER RO
epc8031SensorIndex .81.1.6.1.1.1.x Integer32 RO
epc8031TempSensor .81.1.6.1.1.2.x Integer32 RO
epc8031HygroSensor .81.1.6.1.1.3.x Integer32 RO
epc8031InputSensor .81.1.6.1.1.4.x INTEGER RO
epc8031AirPressure .81.1.6.1.1.5.x Integer32 RO
epc8031DewPoint .81.1.6.1.1.6.x Integer32 RO
epc8031DewPointDiff .81.1.6.1.1.7.x Integer32 RO
epc8031ExtSensorName .81.1.6.1.1.32.x OCTETS RW

4.5.2 Device MIB 8035

Below is a table of all device-specific OID's which can be accessed via SNMP. In the numerical representation of the OID the prefix "1.3.6.1.4.1.28507" (Gude Enterprise OID) was omitted at each entry in the table to preserve space. The example for a complete OID would be "1.3.6.1.4.1.28507.83.1.1.1.1.1". A distinction is made in SNMP OID's in between tables and scalars. OID scalar have the extension ".0" and only specify a value. In SNMP tables the "x" is replaced by an index (1 or greater) to address a value from the table.

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>OID</th>
<th>Type</th>
<th>Acc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>epc8035TrapCtrl</td>
<td></td>
<td>.83.1.1.1.1.0</td>
<td>Integer32</td>
<td>RW</td>
</tr>
<tr>
<td>epc8035TrapIPIndex</td>
<td></td>
<td>.83.1.1.1.2.1.1.x</td>
<td>Integer32</td>
<td>RO</td>
</tr>
<tr>
<td>epc8035TrapAddr</td>
<td></td>
<td>.83.1.1.1.2.1.2.x</td>
<td>OCTETS</td>
<td>RW</td>
</tr>
<tr>
<td>epc8035PortNumber</td>
<td></td>
<td>.83.1.3.1.1.0</td>
<td>Integer32</td>
<td>RO</td>
</tr>
<tr>
<td>epc8035PortIndex</td>
<td></td>
<td>.83.1.3.1.2.1.1.x</td>
<td>Integer32</td>
<td>RO</td>
</tr>
<tr>
<td>epc8035PortName</td>
<td></td>
<td>.83.1.3.1.2.1.2.x</td>
<td>OCTETS</td>
<td>RW</td>
</tr>
<tr>
<td>epc8035PortState</td>
<td></td>
<td>.83.1.3.1.2.1.3.x</td>
<td>INTEGER</td>
<td>RW</td>
</tr>
<tr>
<td>epc8035PortSwitchCount</td>
<td></td>
<td>.83.1.3.1.2.1.4.x</td>
<td>Integer32</td>
<td>RO</td>
</tr>
<tr>
<td>epc8035PortStartupMode</td>
<td></td>
<td>.83.1.3.1.2.1.5.x</td>
<td>INTEGER</td>
<td>RW</td>
</tr>
<tr>
<td>epc8035PortStartupDelay</td>
<td></td>
<td>.83.1.3.1.2.1.6.x</td>
<td>Integer32</td>
<td>RW</td>
</tr>
</tbody>
</table>
### Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Type</th>
<th>Access</th>
</tr>
</thead>
<tbody>
<tr>
<td>epc8035PortRepowerTime</td>
<td>Delay in sec for startup action</td>
<td>Integer32</td>
<td>RW</td>
</tr>
<tr>
<td>epc8035Buzzer</td>
<td>Delay in sec for repower port after switching off</td>
<td>Integer32</td>
<td>RW</td>
</tr>
<tr>
<td>epc8035ActivePowerChan</td>
<td>Number of supported Power Channels.</td>
<td>Unsigned32</td>
<td>RO</td>
</tr>
<tr>
<td>epc8035PowerIndex</td>
<td>Index of Power Channel entries</td>
<td>Integer32</td>
<td>RO</td>
</tr>
<tr>
<td>epc8035ChanStatus</td>
<td>0 = data not active, 1 = data valid</td>
<td>Integer32</td>
<td>RO</td>
</tr>
<tr>
<td>epc8035AbsEnergyActive</td>
<td>Absolute Active Energy counter.</td>
<td>Integer32</td>
<td>RO</td>
</tr>
<tr>
<td>epc8035PowerActive</td>
<td>Active Power</td>
<td>Integer32</td>
<td>RO</td>
</tr>
<tr>
<td>epc8035Current</td>
<td>Actual Current on Power Channel</td>
<td>Gauge32</td>
<td>RO</td>
</tr>
<tr>
<td>epc8035Voltage</td>
<td>Actual Voltage on Power Channel</td>
<td>Gauge32</td>
<td>RO</td>
</tr>
<tr>
<td>epc8035Frequency</td>
<td>Frequency of Power Channel</td>
<td>Gauge32</td>
<td>RO</td>
</tr>
<tr>
<td>epc8035PowerFactor</td>
<td>Power Factor of Channel between -1.0 and 1.00</td>
<td>Integer32</td>
<td>RO</td>
</tr>
<tr>
<td>epc8035Pangle</td>
<td>Phase Angle between Voltage and L Line Current between -180.0 and 180.0</td>
<td>Integer32</td>
<td>RO</td>
</tr>
<tr>
<td>epc8035PowerApparent</td>
<td>L Line Mean Apparent Power</td>
<td>Integer32</td>
<td>RO</td>
</tr>
<tr>
<td>epc8035PowerReactive</td>
<td>L Line Mean Reactive Power</td>
<td>Integer32</td>
<td>RO</td>
</tr>
<tr>
<td>epc8035AbsEnergyReactive</td>
<td>Absolute Reactive Energy counter.</td>
<td>Integer32</td>
<td>RO</td>
</tr>
<tr>
<td>epc8035AbsEnergyActiveReset-table</td>
<td>Resettable Absolute Active Energy counter. Writing '0' resets all resettable counter.</td>
<td>Integer32</td>
<td>RW</td>
</tr>
<tr>
<td>epc8035AbsEnergyReactiveReset-table</td>
<td>Resettable Absolute Reactive Energy counter.</td>
<td>Integer32</td>
<td>RO</td>
</tr>
<tr>
<td>epc8035ResetTime</td>
<td>Time in seconds since last Energy Counter reset</td>
<td>Gauge32</td>
<td>RO</td>
</tr>
<tr>
<td>epc8035ForwEnergyActive</td>
<td>Forward Active Energy counter.</td>
<td>Gauge32</td>
<td>RO</td>
</tr>
<tr>
<td>epc8035ForwEnergyReactive</td>
<td>Forward Reactive Energy counter.</td>
<td>Gauge32</td>
<td>RO</td>
</tr>
<tr>
<td>epc8035RevEnergyActive</td>
<td>Reverse Active Energy counter.</td>
<td>Gauge32</td>
<td>RO</td>
</tr>
<tr>
<td>epc8035RevEnergyActiveReset-table</td>
<td>Resettable Reverse Active Energy counter.</td>
<td>Gauge32</td>
<td>RO</td>
</tr>
<tr>
<td>epc8035ResidualCurrent</td>
<td>Actual Residual Current on Power Channel. According Type A IEC 60755. Only visible on models that support this feature.</td>
<td>Integer32</td>
<td>RO</td>
</tr>
<tr>
<td>epc8035ResidualCurrentRMS</td>
<td>Actual Residual Current RMS on Power Channel. According Type B IEC 60755. Only visible on models that support this feature.</td>
<td>Integer32</td>
<td>RO</td>
</tr>
<tr>
<td>epc8035ResidualCurrentDC</td>
<td>Actual Residual Current DC on Power Channel. According Type B IEC 60755. Only visible on models that support this feature.</td>
<td>Integer32</td>
<td>RO</td>
</tr>
<tr>
<td>epc8035LineSensorName</td>
<td>A textual string containing name of a Line Sensor</td>
<td>OCTETS</td>
<td>RW</td>
</tr>
<tr>
<td>epc8035OVPIndex</td>
<td>None</td>
<td>Integer32</td>
<td>RO</td>
</tr>
<tr>
<td>epc8035OVPStatus</td>
<td>shows the status of the built-in Overvoltage Protection</td>
<td>Integer32</td>
<td>RO</td>
</tr>
<tr>
<td>epc8035spActivePowerChan</td>
<td></td>
<td>Integer32</td>
<td>RO</td>
</tr>
</tbody>
</table>
Specifications

Number of Single Port Power Channels. Value is zero on EPC 8220 series.

epc8035spPowerIndex
Index of Single Port Power Channel entries. Indices 0-5 mean Ports A1 to A6, 6-11 are Ports B1 to B6.

epc8035spChanStatus
0 = data not active, 1 = data valid

epc8035spAbsEnergyActive
Absolute Active Energy counter.

epc8035spPowerActive
Active Power

epc8035spCurrent
Actual Current on Power Channel.

epc8035spVoltage
Actual Voltage on Power Channel.

epc8035spFrequency
Frequency of Power Channel

epc8035spPowerFactor
Power Factor of Channel between -1.0 and 1.00

epc8035spPangle
Phase Angle between Voltage and L Line Current between -180.0 and 180.0

epc8035spPowerApparent
L Line Mean Apparent Power

epc8035spPowerReactive
L Line Mean Reactive Power

epc8035spAbsEnergyActiveResettable
Resettable Absolute Active Energy counter. Writing '0' resets all resettable counter.

epc8035spAbsEnergyActiveResettable
Resettable Absolute Active Energy counter. Writing '0' resets all resettable counter.

epc8035spResetTime
Time in seconds since last Energy Counter reset.

epc8035spForwEnergyActive
Forward Active Energy counter.

epc8035spForwEnergyReactive
Forward Reactive Energy counter.

epc8035spForwEnergyActiveResettable
Resettable Forward Active Energy counter.

epc8035spForwEnergyReactiveResettable
Resettable Forward Reactive Energy counter.

epc8035spRevEnergyActive
Reverse Active Energy counter.

epc8035spRevEnergyReactive
Reverse Reactive Energy counter.

epc8035spRevEnergyActiveResettable
Resettable Reverse Active Energy counter.

epc8035spRevEnergyReactiveResettable
Resettable Reverse Reactive Energy counter.

epc8035SensorIndex
None

epc8035TempSensor
actual temperature

epc8035HygroSensor
actual humidity

epc8035InputSensor
logical state of input sensor

epc8035AirPressure
actual air pressure

epc8035DewPoint
dew point for actual temperature and humidity

epc8035DewPointDiff
difference between dew point and actual temperature (Temp - DewPoint)

epc8035ExtSensorName
A textual string containing name of a external Sensor
Specifications

4.6 SSL

TLS Standard

The device is compatible with the standards TLSv1.0 to TLSv1.2. Due to lack of security, SSLv3.0 as well as RC4 and DES encryptions are deactivated.

The following TLS Ciphersuites are supported:

- TLS_RSA_WITH_3DES_EDE_CBC_SHA
- TLS_DHE_RSA_WITH_3DES_EDE_CBC_SHA
- TLS_RSA_WITH_AES_128_CBC_SHA
- TLS_DHE_RSA_WITH_AES_128_CBC_SHA
- TLS_RSA_WITH_AES_256_CBC_SHA
- TLS_DHE_RSA_WITH_AES_256_CBC_SHA
- TLS_RSA_WITH_AES_128_CBC_SHA256
- TLS_RSA_WITH_AES_256_CBC_SHA256
- TLS_DHE_RSA_WITH_AES_128_CBC_SHA256
- TLS_DHE_RSA_WITH_AES_256_CBC_SHA256
- TLS_RSA_WITH_AES_128_GCM_SHA256
- TLS_DHE_RSA_WITH_AES_128_GCM_SHA256
- TLS_RSA_WITH_AES_256_GCM_SHA256
- TLS_DHE_RSA_WITH_AES_256_GCM_SHA256
- TLS_RSA_WITH_AES_128_CCM
- TLS_DHE_RSA_WITH_AES_128_CCM
- TLS_RSA_WITH_AES_256_CCM
- TLS_DHE_RSA_WITH_AES_256_CCM
- TLS_RSA_WITH_AES_128_CCM_8
- TLS_DHE_RSA_WITH_AES_128_CCM_8
- TLS_RSA_WITH_AES_256_CCM_8
- TLS_DHE_RSA_WITH_AES_256_CCM_8
- TLS_ECDHE_RSA_WITH_CHACHA20_POLY1305_SHA256
- TLS_ECDHE_ECDSA_WITH_CHACHA20_POLY1305_SHA256
- TLS_DHE_RSA_WITH_CHACHA20_POLY1305_SHA256
- TLS_ECDHE_ECDSA_WITH_CHACHA20_POLY1305_SHA256
- TLS_DHE_RSA_WITH_CHACHA20_POLY1305_SHA256

Creating your own Certificates

The SSL stack is supplied with a specially newly generated certificate. There is no function to generate the local certificate anew at the touch of a button, since the required random numbers...
Specifications

in an embedded device are usually not independent enough. However, you can create new certificates and import them to the device. The server accepts RSA (1024/2048/4096) and ECC (Elliptic Curve Cryptography) certificates.

Usually OpenSSL is used to create an SSL certificate. For Windows for example, there is the light version of Shining Light Productions. There you open a command prompt, change to the directory "C:/OpenSSL-Win32\bin" and set these environment variables:

```bash
set openssl_conf=C:\OpenSSL-Win32\bin\openssl.cfg
set RANDFILE=C:\OpenSSL-Win32\bin\\rnd
```

Here are some examples for the generation with OpenSSL:

**Creation of a self-signed RSA 2048-bit certificate**

```bash
openssl genrsa -out server.key 2048
openssl req -new -x509 -days 365 -key server.key -out server.crt
```

**RSA 2048-bit certificate with Sign Request:**

```bash
openssl genrsa -out server.key 2048
openssl req -new -key server.key -out server.csr
openssl req -x509 -days 365 -key server.key -in server.csr -out server.crt
```

⚠️ The server keys should be generated with "openssl genrsa". If in the generated key file it reads only "----- BEGIN PRIVATE KEY -----" and not "----- BEGIN RSA PRIVATE KEY -----", the key is not recognized.

**ECC Certificate with Sign Request:**

```bash
openssl ecparam -genkey -name prime256v1 -out server.key
openssl req -new -key server.key -out server.csr
openssl req -x509 -days 365 -key server.key -in server.csr -out server.crt
```

If you have created your key and certificate, both files are concatenated to one file:

Linux:

```bash
cat server.crt server.key > server.pem
```

Windows:

```bash
copy server.crt + server.key server.pem
```

The created server.pem can only be uploaded in the maintenance section of the device.

⚠️ If several certificates (Intermediate CRT's) should also be uploaded to the device, one should make sure, that firstly the server certificate and secondly the Intermediates are assembled, e.g:

```bash
cat server.crt IM1.crt IM2.crt server.key > server.pem
```

⚠️ An uploaded certificate will be preserved, when a device is put back to factory defaults.

Performance Considerations
If RSA 4096 certificates are used, the first access to the web server can take 8-10 seconds, because the math unit of the embedded CPU is highly demanded. After that, the parameters are in the SSL session cache, so all other requests are just as fast as with other certificate lengths. For a quick response even on the first access, we recommend RSA 2048-bit certificates that offer adequate security, too.

4.7 Console

For the configuration and control of the device, there is a set of commands with parameters that can be entered through a console. The console is available via Telnet, or for devices with RS232 port through using a serial terminal. It is not necessary to use Telnet, in Raw Mode a simple TCP/IP connection is sufficient to send commands. The communication can also be performed automated (e.g. via scripting languages). The console features are configured through the web interface.

Command Set

There are several command levels. The following commands are usable from each level:

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>back</td>
<td>go back one level</td>
</tr>
<tr>
<td>help</td>
<td>all commands of the actual level</td>
</tr>
<tr>
<td>help all</td>
<td>show all commands</td>
</tr>
<tr>
<td>logout</td>
<td>logout (only when login required)</td>
</tr>
<tr>
<td>quit</td>
<td>quit console</td>
</tr>
</tbody>
</table>

The "help" command returns all the commands of the current level. If "help" is called from the top level, e.g. the line "http [subtopics]" appears. This means that there is another level for "http". With the command "http help" all commands below "http" are shown. Alternatively, with entering "http" you can select the http level, and "help" shows all the commands on the selected level. The command "back" again selects the top level. It is possible to use "help" at any position: "http passwd help" provides all commands that have the prefix "http passwd".

You will find a complete list of all possible device commands in the chapter "Cmd Overview".

Parameter

If parameters are expected for the command, the parameter may be passed as numeric or constant. If e.g. you get the following line as help:

```
http server set {http_both=0|https_only=1|http_only=2}
```

the following instruction pairs are equivalent:

```
http server set https_only
http server set 1
```

or

```
http server set https_both
http server set 0
```
Numerical parameters can be entered with different bases. Here is an example of the decimal value 11:

<table>
<thead>
<tr>
<th>Base</th>
<th>Input</th>
</tr>
</thead>
<tbody>
<tr>
<td>decimal (10)</td>
<td>11</td>
</tr>
<tr>
<td>hexadecimal (16)</td>
<td>0xb</td>
</tr>
<tr>
<td>octal (8)</td>
<td>013</td>
</tr>
<tr>
<td>binary (2)</td>
<td>0b1011</td>
</tr>
</tbody>
</table>

**Bit Field Parameter**

Some parameters can take several values at the same time. In the following example, all values between 0 and 5 can be set. In the help, this can be recognized by the fact that the values are not separated by the "|" character, but by commas.

```
"{EVT_SYSLOG=0,EVT_SNMP=1,EVT_EMAIL=2,EVT_SMS=3,EVT_GSMEMAIL=4,EVT_BEEPER=5}"
```

To set EVT_SYSLOG and EVT_EMAIL in a command, you can use the following syntax:

```
>extsensor 1 2 0 events type set "EVT_SYSLOG,EVT_EMAIL"
OK.
```

or numeric

```
>extsensor 1 2 0 events type set "0,2"
OK.
```

Additionally you can set all values with "ALLSET" or encode any bit pattern as hexadecimal with a syntax like "#7f1a".

**Return Values**

If a command is unknown or a parameter is incorrect, the output "ERR." is given at the beginning of the line, followed by a description of the fault. Successful instructions without special return value will be acknowledged by "OK.". All other return values are output within a single line. There are of two exceptions:

1. Some configuration changes, that affect TCP / IP and UDP, need a restart to be applied. These parameters are output on two lines. In the first line the current value is shown, on the second row the value after a restart. In the "Cmd Overview" table this is marked with "Note 2".
2. Other configurations (such as the assigned IPv6 addresses) have several values that can change dynamically. This is marked with "Note 3" in the "Cmd Overview" table.

**Numerical Returns**

For parameters that support constants, these constants are output as return values. To better deal with scripting languages, it may be easier to work only with numerical returns. The command "vt100 numeric set ON" enables that only numerical values appear.

**Comments**

If you use a tool to send an entire file of commands via Telnet, it is helpful, if you can
place comments in there. Beginning with the comment character "#", the remaining contents of a line is ignored.

**Telnet**

If the configuration "Raw Mode" is turned off, it is tried to negotiate the Telnet configuration between client and server using IAC commands. If this fails, the editing functions are not active, and the "Activate echo" option determines whether the characters sent to the Telnet server will be returned. Normally the client begins with the IAC negotiation. If this is not the case with the client, the device configuration "Active negotiation" should be turned on.

**Raw Mode**

If you want to use the console only automated, it may be advantageous to set the configuration "Raw mode" to "yes" and "Activate echo" to "no" to. Then there is no interfering interaction with the editor functions and the is no need to filter the sent characters to process the return values.

⚠️ If in the console "Raw mode" is activated but not in the used Telnet client, the IAC commands sent at the beginning can appear as interfering characters in the command line (partially invisible).

**Editing**

The following edit functions are available when the terminal supports VT100, and Raw Mode is deactivated. Entered characters are inserted at the cursor position.

<table>
<thead>
<tr>
<th>Keys</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Left, Right</td>
<td>moves cursor left or right</td>
</tr>
<tr>
<td>Pos 1, End</td>
<td>moves cursor to the beginning or end of line</td>
</tr>
<tr>
<td>Del</td>
<td>deletes character under the cursor</td>
</tr>
<tr>
<td>Backspace</td>
<td>deletes character left of cursor</td>
</tr>
<tr>
<td>Up, Down</td>
<td>shows input lines history</td>
</tr>
<tr>
<td>Tab, Ctrl-Tab</td>
<td>completes the word at cursor</td>
</tr>
<tr>
<td>Ctrl-C</td>
<td>clears the line</td>
</tr>
</tbody>
</table>

⚠️ When a shrink of the terminal window leads to the result, that the input line extends over multiple lines on the terminal, the editing does not work reliably.

**Bundled Information**

The syntax of console commands does not make it easy to output bundled information with few commands. The following special commands make this easier:

a) External Sensors

>extsensor all show

E=1, T="7106", 0="21.3°C", 1="35.1%", 3="1013hPa", 4="5.2°C", 5="16.0°C"

E=2, T="7102", 0="21.2°C", 1="35.4%", 4="5.3°C", 5="15.9°C"

The command lists one connected external sensor per line, and the individual measured values are separated by commas after the label name. The digit before the equal sign corresponds to the Index field in the External Sensor Table.
b) Line Sensors

>linesensor all "0,1,2,3,12" show
L=1,L="Power Port",0="13000Wh",1="0W",2="225V",3="0A",12="998218s"
L=2,L="Power Port",0="13000Wh",1="0W",2="223V",3="0A",12="996199s"

This command outputs all line sensor values in one line. A list of all fields (according to the energy sensor table) is transferred as parameter. In this example these are the fields Absolute Active Energy (0), Power Active (1), Voltage (2), Current (3) and Reset Time (12).

c) Port Sensors

>portsensor all "0,1,2,3,12" show
P=1,L="Power Port",0="13000Wh",1="0W",2="225V",3="0A",12="998218s"
P=2,L="Power Port",0="13000Wh",1="0W",2="223V",3="0A",12="996199s"
... P=12,L="Power Port",0="13000Wh",1="0W",2="225V",3="0A",12="998218s"

This command outputs all port sensor values in one line. A list of all fields (according to the energy sensor table) is passed as parameter. In this example these are the fields Absolute Active Energy (0), Power Active (1), Voltage (2), Current (3) and Reset Time (12).

d) Displaying Port Relays

>port all state 1 show
P1=ON,P2=OFF,P3=ON,P4=OFF,P5=OFF,P6=OFF,P7=OFF,P8=ON

The command "port all state {MODE0=0|MODE1=1|MODE2=2} show" returns the switching state of all relays in 3 possible formats.

e) Switching Port Relays

#port all state set "1,2,12" 1
OK.

The command syntax "port all state set "(port_list)" (OFF=0|ON=1)" sets a list of ports to ON=1 or OFF=0.

4.7.1 Console Cmd 8031

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>logout</td>
<td>go to login prompt when enabled</td>
<td>2</td>
</tr>
<tr>
<td>quit</td>
<td>quits telnet session - nothing in serial console</td>
<td>2</td>
</tr>
<tr>
<td>back</td>
<td>back one cmd level</td>
<td>2</td>
</tr>
<tr>
<td>help</td>
<td>show all cmds from this level</td>
<td>2</td>
</tr>
<tr>
<td>help all</td>
<td>show all cmds</td>
<td>2</td>
</tr>
<tr>
<td>clock</td>
<td>enters cmd group &quot;clock&quot;</td>
<td></td>
</tr>
<tr>
<td>clock enabled set {OFF=0</td>
<td>ON=1}</td>
<td>enables ntp</td>
</tr>
<tr>
<td>clock enabled show</td>
<td>shows if ntp enabled</td>
<td></td>
</tr>
<tr>
<td>clock timezone set {minutes}</td>
<td>sets timezone</td>
<td></td>
</tr>
<tr>
<td>clock timezone show</td>
<td>shows timezone</td>
<td></td>
</tr>
<tr>
<td>clock dst enabled set {OFF=0</td>
<td>ON=1}</td>
<td>enables dst</td>
</tr>
<tr>
<td>clock dst enabled show</td>
<td>shows if dst is enabled</td>
<td></td>
</tr>
<tr>
<td>clock manual set &quot;[hh:mm:ss yyyy-mm-dd]&quot;</td>
<td>sets time and date manually</td>
<td></td>
</tr>
<tr>
<td>clock show</td>
<td>shows actual time and date</td>
<td></td>
</tr>
</tbody>
</table>
### Specifications

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>`clock ntp server {PRIMARY=0</td>
<td>BACKUP=1} set &quot;(dns_name)&quot;`</td>
</tr>
<tr>
<td>`clock ntp server {PRIMARY=0</td>
<td>BACKUP=1} show`</td>
</tr>
</tbody>
</table>

- `console` enters cmd group "console"
- `console version` shows unique console version number
- `console telnet enabled set {OFF=0|ON=1}` enables telnet on/off
- `console telnet enabled show` shows if telnet enabled
- `console telnet port set {ip_port}` sets telnet port
- `console telnet port show` shows telnet port
- `console telnet raw set {OFF=0|ON=1}` sets raw mode (disables editing) on/off
- `console telnet raw show` shows if raw mode enabled
- `console telnet echo set {OFF=0|ON=1}` enables echo on/off
- `console telnet echo show` shows if echo enabled
- `console telnet activeneg set {OFF=0|ON=1}` enables telnet active negotiation (IAC) on/off
- `console telnet activeneg show` shows if active negotiation enabled
- `console telnet login set {OFF=0|ON=1}` enables login on/off
- `console telnet login show` shows if login enabled
- `console serial enabled set {OFF=0|ON=1}` enables serial console on/off
- `console serial enabled show` shows if serial console enabled
- `console serial raw set {OFF=0|ON=1}` sets raw mode (disables editing) on/off
- `console serial raw show` shows if raw mode enabled
- `console serial kvm set {OFF=0|ON=1}` enables binary KVM cmds on serial port on/off
- `console serial kvm show` shows if binary KVM cmds enabled
- `console serial utf8 set {OFF=0|ON=1}` enables UTF8 support
- `console serial utf8 show` shows if UTF8 enabled

- `email` enters cmd group "email"
- `email enabled set {OFF=0|ON=1}` enables email on/off
- `email enabled show` shows if email is enabled
- `email sender set "(email_addr)"` sets email sender address
- `email sender show` shows email sender address
- `email recipient set "(email_addr)"` sets email recipient address
- `email recipient show` shows email recipient address
- `email server set "(dns_name)"` sets email SMTP server address
- `email server show` shows email SMTP server address
- `email port set {ip_port}` sets email SMTP port
- `email port show` shows email SMTP port
- `email security set {NONE=0|STARTTLS=1|SSL=2}` sets SMTP connection security
- `email security show` shows SMTP connection security
- `email auth set {NONE=0|PLAIN=1|LOGIN=2}` sets email authentication
- `email auth show` shows email authentication
- `email user set "(username)"` sets SMTP username
- `email user show` shows SMTP username
- `email passwd set "(password)"` sets encrypted SMTP password
- `email passwd hash set "(password)"` sets login hashed password
- `email testmail` sends test email

- `ethernet` enters cmd group "ethernet"
- `ethernet mac show` shows MAC address
- `ethernet link show` shows ethernet link state
- `ethernet phyprefer set [10MBIT_HD=0]` sets preferred speed for PHY Auto Negotiation
Specifications

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ethernet phyprefer show</td>
<td>shows preferred speed for PHY Auto Negotiation</td>
</tr>
<tr>
<td>extsensor</td>
<td>enters cmd group &quot;extsensor&quot;</td>
</tr>
<tr>
<td>extsensor all show</td>
<td>shows all values from connected external sensors</td>
</tr>
<tr>
<td>extsensor all show</td>
<td>shows all plugged sensors and fields</td>
</tr>
<tr>
<td>extsensor (port_num) [sen_field] value show &quot;(name)&quot;</td>
<td>shows sensor value</td>
</tr>
<tr>
<td>extsensor (port_num) [sen_type] label set &quot;(name)&quot;</td>
<td>sets sensor name to label</td>
</tr>
<tr>
<td>extsensor (port_num) [sen_type] label show</td>
<td>shows label of sensor</td>
</tr>
<tr>
<td>extsensor (port_num) type show</td>
<td>shows type of sensor</td>
</tr>
<tr>
<td>extsensor (port_num) [sen_type] [sen_field] events set [off=0</td>
<td>on=1]</td>
</tr>
<tr>
<td>extsensor (port_num) [sen_type] [sen_field] events show</td>
<td>shows if sensor events are enabled</td>
</tr>
<tr>
<td>extsensor (port_num) [sen_type] [sen_field] events type set &quot;(EVT_SYSLOG=0,EVT_SNMP=1,EVT_EMAIL=2,EVT_SMS=3,EVT_GSMEMAIL=4,EVT_BEEPER #0)&quot;</td>
<td>enables different event types</td>
</tr>
<tr>
<td>extsensor (port_num) [sen_type] [sen_field] events type show</td>
<td>shows what event types are enabled</td>
</tr>
<tr>
<td>extsensor (port_num) [sen_type] [sen_field] maxval set (num)</td>
<td>sets maximum value for sensor</td>
</tr>
<tr>
<td>extsensor (port_num) [sen_field] maxval show</td>
<td>shows maximum value for sensor</td>
</tr>
<tr>
<td>extsensor (port_num) [sen_type] [sen_field] minval set (num)</td>
<td>sets minimum value for sensor</td>
</tr>
<tr>
<td>extsensor (port_num) [sen_field] minval show</td>
<td>shows minimum value for sensor</td>
</tr>
<tr>
<td>extsensor (port_num) [sen_field] hyst set (num)</td>
<td>sets hysterese value for sensor</td>
</tr>
<tr>
<td>extsensor (port_num) [sen_field] hyst show</td>
<td>shows hysterese value for sensor</td>
</tr>
<tr>
<td>extsensor (port_num) [sen_type] [sen_field] [BELOWMIN=0</td>
<td>ABOVEMIN=1</td>
</tr>
<tr>
<td>extsensor (port_num) [sen_type] [sen_field] [BELOWMIN=0</td>
<td>ABOVEMIN=1</td>
</tr>
<tr>
<td>extsensor (port_num) [sen_type] [sen_field] [BELOWMIN=0</td>
<td>ABOVEMIN=1</td>
</tr>
<tr>
<td>extsensor period set [24H=0</td>
<td>12H=1</td>
</tr>
<tr>
<td>extsensor period show</td>
<td>shows sensor Min/Max measurement period</td>
</tr>
<tr>
<td>extsensor beeper set [OFF=0</td>
<td>ON=1]</td>
</tr>
<tr>
<td>extsensor beeper show</td>
<td>shows if beeper sensor alarms are enabled</td>
</tr>
</tbody>
</table>

http

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>http server set [HTTP_BOTH=0</td>
<td>HTTPS_ONLY=1]</td>
</tr>
<tr>
<td>http server set [HTTP_BOTH=0</td>
<td>HTTPS_ONLY=1]</td>
</tr>
<tr>
<td>http server show</td>
<td>shows webserver accepting connection types</td>
</tr>
<tr>
<td>http port set (ip_port)</td>
<td>sets http port</td>
</tr>
<tr>
<td>http port show</td>
<td>shows http port</td>
</tr>
<tr>
<td>http portssl set (ip_port)</td>
<td>sets https port</td>
</tr>
<tr>
<td>http portssl show</td>
<td>shows https port</td>
</tr>
<tr>
<td>http ajax enabled set [OFF=0</td>
<td>ON=1]</td>
</tr>
<tr>
<td>http ajax enabled show</td>
<td>shows if ajax autorefresh enabled</td>
</tr>
<tr>
<td>http password enabled set [OFF=0</td>
<td>ON=1]</td>
</tr>
<tr>
<td>http password enabled show</td>
<td>shows if http password enabled</td>
</tr>
<tr>
<td>http passwd user set &quot;(passwd)&quot;</td>
<td>sets http user password</td>
</tr>
<tr>
<td>http passwd admin set &quot;(passwd)&quot;</td>
<td>sets http admin password</td>
</tr>
<tr>
<td>http passwd hash user set &quot;(passwd)&quot;</td>
<td>sets hashed http user password</td>
</tr>
<tr>
<td>http passwd hash admin set &quot;(passwd)&quot;</td>
<td>sets hashed http admin password</td>
</tr>
</tbody>
</table>

ip4

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ip4</td>
<td>enters cmd group &quot;ip4&quot;</td>
</tr>
<tr>
<td>ip4 hostname set &quot;(name)&quot;</td>
<td>sets device hostname</td>
</tr>
<tr>
<td>ip4 hostname show</td>
<td>shows device hostname</td>
</tr>
<tr>
<td>ip4 address set &quot;(ip_address)&quot;</td>
<td>sets IPv4 address</td>
</tr>
<tr>
<td>ip4 address show</td>
<td>shows IPv4 address</td>
</tr>
<tr>
<td>ip4 netmask set &quot;(ip_address)&quot;</td>
<td>sets IPv4 netmask</td>
</tr>
<tr>
<td>ip4 netmask show</td>
<td>shows IPv4 netmask</td>
</tr>
</tbody>
</table>
Specifications

ip4 gateway set "{ip_address}"  sets IPv4 gateway address
ip4 gateway show  shows IPv4 gateway address
ip4 dns set "{ip_address}"  sets IPv4 DNS server address
ip4 dns show  shows IPv4 DNS server address
ip4 dhcp enabled set {OFF=0|ON=1}  enables IPv4 DHCP on/off
ip4 dhcp enabled show  shows IPv4 DHCP state

ip6  enters cmd group "ip6"
ip6 enabled set {OFF=0|ON=1}  enables IPv6 on/off
ip6 enabled show  shows if IPv6 is enabled
ip6 rouadv enabled set {OFF=0|ON=1}  enables IPv6 router advertisement
ip6 rouadv enabled show  shows IPv6 router advertisement state
ip6 dhcp enabled set {OFF=0|ON=1}  enables IPv6 DHCP on/off
ip6 dhcp enabled show  shows if IPv6 DHCP is enabled
ip6 address show  shows all IPv6 addresses
ip6 gateway show  shows all IPv6 gateways
ip6 dns show  shows all IPv6 DNS server
ip6 manual enabled set {OFF=0|ON=1}  enables manual IPv6 addresses
ip6 manual enabled show  shows if manual IPv6 addresses are enabled
ip6 manual address {1..4} set "{ip_address}"  sets manual IPv6 address
ip6 manual address {1..4} show  shows manual IPv6 address
ip6 manual gateway set "{ip_address}"  sets manual IPv6 gateway address
ip6 manual gateway show  shows manual IPv6 gateway address
ip6 manual dns {1..2} set "{ip_address}"  sets manual IPv6 DNS server address
ip6 manual dns {1..2} show  shows manual IPv6 DNS server address

ipacl  enters cmd group "ipacl"
ipacl ping enabled set {OFF=0|ON=1}  enables ICMP ping on/off
ipacl ping enabled show  shows if ICMP ping enabled
ipacl enabled set {OFF=0|ON=1}  enable IP filter on/off
ipacl enabled show  shows if IP filter enabled
ipacl filter {ipacl_num} set "{dns_name}"  sets IP filter {ipacl_num}
ipacl filter {ipacl_num} show  shows IP filter {ipacl_num}

linesensor  enters cmd group "linesensor"
linesensor all {field_list} show  shows energy sensors according field list of all linesensors
linesensor {line_num} {energy_sensor} value show  shows energy sensor of given line
linesensor {line_num} counter reset  resets energy metering counter
linesensor {line_num} label set "{name}"  sets line meter to label
linesensor {line_num} label show  shows label of line meter
linesensor {line_num} {energy_sensor} events set {OFF=0|ON=1}  enables events on/off
linesensor {line_num} events show  shows if events are enabled
linesensor {line_num} {energy_sensor} events type set  "EVTSYSLOG=0,EVTSNMP=1,EVTEMAIL=2 enables different event types, EVT_SMS=3,EVT_GSMTP=4,EVT_BEEPER=5"
linesensor {line_num} {energy_sensor} events type show  shows what event types are enabled
linesensor {line_num} {energy_sensor} maxval set {float}  sets maximum value for line meter
linesensor {line_num} {energy_sensor} maxval show  shows maximum value for line meter
linesensor {line_num} {energy_sensor} minval set {float}  sets minimum value for line meter
linesensor {line_num} {energy_sensor} minval show  shows minimum value for line meter
linesensor {line_num} {energy_sensor} hyst set {float}  sets hysteresis value for line meter
linesensor {line_num} {energy_sensor} hyst show  shows hysteresis value for line meter
linesensor {line_num} {energy_sensor} [BELOWMIN=0|ABOVEMIN=1|ABOVEMAX=2|BELOWMAX=3] port set {port_num}  sets Port for Power Port Switching actions
linesensor {line_num} {energy_sensor} [BELOWMIN=0|ABOVEMIN=1|ABOVEMAX=2|BELOWMAX=3] port show  shows Port for Power Port Switching actions
linesensor {line_num} {energy_sensor} [BELOWMIN=0|ABOVEMIN=1|ABOVEMAX=2|BELOWMAX=3] state set {OFF=0|ON=1|DISABLED=2}  sets Port state for Power Port Switching actions
linesensor {line_num} {energy_sensor} [BELOWMIN=0|ABOVEMIN=1|ABOVEMAX=2|BELOWMAX=3] state show  shows Port state for Power Port Switching actions
linesensor {line_num} events set {OFF=0|ON=1}  LEGACY - enables events on/off
<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>linesensor {line_num} events show</td>
<td>LEGACY - shows if events are enabled</td>
</tr>
<tr>
<td>linesensor {line_num} events type set &quot;<em>EVT_SYSLOG=0,EVT_SNMP=1,EVT_EMAIL=2,EVT_SMS=3,EVT_GSMTP=4,EVT_BEEPER=5</em>&quot;</td>
<td>LEGACY - enables different event types</td>
</tr>
<tr>
<td>linesensor {line_num} events type show</td>
<td>LEGACY - shows what event types are enabled</td>
</tr>
<tr>
<td>linesensor {line_num} maxval set {float}</td>
<td>LEGACY - sets maximum value for line meter</td>
</tr>
<tr>
<td>linesensor {line_num} maxval show</td>
<td>LEGACY - shows maximum value for line meter</td>
</tr>
<tr>
<td>linesensor {line_num} minval set {float}</td>
<td>LEGACY - sets minimum value for line meter</td>
</tr>
<tr>
<td>linesensor {line_num} minval show</td>
<td>LEGACY - shows minimum value for line meter</td>
</tr>
<tr>
<td>linesensor {line_num} hyst set {float}</td>
<td>LEGACY - sets hysteresis value for line meter</td>
</tr>
<tr>
<td>linesensor {line_num} hyst show</td>
<td>LEGACY - shows hysteresis value for line meter</td>
</tr>
<tr>
<td>linesensor {line_num} [BELOWMIN=0</td>
<td>ABOVEMIN=1</td>
</tr>
<tr>
<td>linesensor {line_num} [BELOWMIN=0</td>
<td>ABOVEMIN=1</td>
</tr>
<tr>
<td>linesensor {line_num} [BELOWMIN=0</td>
<td>ABOVEMIN=1</td>
</tr>
<tr>
<td>linesensor {line_num} [BELOWMIN=0</td>
<td>ABOVEMIN=1</td>
</tr>
<tr>
<td>linesensor beeper set {OFF=0</td>
<td>ON=1}</td>
</tr>
<tr>
<td>linesensor beeper show</td>
<td>shows if beeper for line meter alarms is enabled</td>
</tr>
<tr>
<td>modbus</td>
<td>enters cmd group &quot;modbus&quot;</td>
</tr>
<tr>
<td>modbus enabled set &lt;off=0/on=1&gt;</td>
<td>enables Modbus TCP support</td>
</tr>
<tr>
<td>modbus enabled show</td>
<td>shows if Modbus is enabled</td>
</tr>
<tr>
<td>modbus port set &lt;ip_port&gt;</td>
<td>sets Modbus TCP port</td>
</tr>
<tr>
<td>modbus port show</td>
<td>shows Modbus TCP port</td>
</tr>
<tr>
<td>port</td>
<td>enters cmd group &quot;port&quot;</td>
</tr>
<tr>
<td>port {port_num} state set {OFF=0</td>
<td>ON=1}</td>
</tr>
<tr>
<td>port {port_num} state show</td>
<td>shows port state</td>
</tr>
<tr>
<td>port all state set &quot;<em>port_list</em>&quot; {OFF=0</td>
<td>ON=1}</td>
</tr>
<tr>
<td>port all state {MODE0=0</td>
<td>MODE1=1</td>
</tr>
<tr>
<td>port {port_num} reset</td>
<td>start reset sequence for port</td>
</tr>
<tr>
<td>port {port_num} toggle</td>
<td>toggles port</td>
</tr>
<tr>
<td>port {port_num} batch set {OFF=0</td>
<td>ON=1} wait {num_seecs} {OFF=0</td>
</tr>
<tr>
<td>port {port_num} batch cancel</td>
<td>cancels batch mode</td>
</tr>
<tr>
<td>port {port_num} label set &quot;{name}&quot;</td>
<td>sets port label name</td>
</tr>
<tr>
<td>port {port_num} label show</td>
<td>shows port label name</td>
</tr>
<tr>
<td>port {port_num} initstate coldstart set {OFF=0</td>
<td>ON=1</td>
</tr>
<tr>
<td>port {port_num} initstate coldstart show</td>
<td>shows port coldstart initialization</td>
</tr>
<tr>
<td>port {port_num} initstate delay set {num}</td>
<td>sets port init delay</td>
</tr>
<tr>
<td>port {port_num} initstate delay show</td>
<td>shows port init delay</td>
</tr>
<tr>
<td>port {port_num} repowerdelay set {num}</td>
<td>sets port repower delay</td>
</tr>
<tr>
<td>port {port_num} repowerdelay show</td>
<td>shows port repower delay</td>
</tr>
<tr>
<td>port {port_num} resettime set {num}</td>
<td>sets port reset duration</td>
</tr>
<tr>
<td>port {port_num} resettime show</td>
<td>shows port reset duration</td>
</tr>
<tr>
<td>port {port_num} watchdog enabled set {OFF=0</td>
<td>ON=1}</td>
</tr>
<tr>
<td>port {port_num} watchdog enabled show</td>
<td>shows port watchdog state</td>
</tr>
<tr>
<td>port {port_num} watchdog mode set {OFF=0</td>
<td>PORT_RESET=1</td>
</tr>
<tr>
<td>port {port_num} watchdog mode show</td>
<td>shows port watchdog mode</td>
</tr>
<tr>
<td>port {port_num} watchdog type set {WD_ICMP=0</td>
<td>WD_TCP=1</td>
</tr>
<tr>
<td>port {port_num} watchdog type show</td>
<td>shows port watchdog type</td>
</tr>
<tr>
<td>port {port_num} watchdog host set &quot;{dns_name}&quot;</td>
<td>sets port watchdog host target</td>
</tr>
<tr>
<td>port {port_num} watchdog host show</td>
<td>shows port watchdog host target</td>
</tr>
<tr>
<td>port {port_num} watchdog port set {ip_port}</td>
<td>sets port watchdog TCP port</td>
</tr>
<tr>
<td>port {port_num} watchdog port show</td>
<td>shows port watchdog TCP port</td>
</tr>
<tr>
<td>port {port_num} watchdog pingset interval set {num}</td>
<td>sets port watchdog ping interval</td>
</tr>
<tr>
<td>port {port_num} watchdog pingset interval show</td>
<td>shows port watchdog ping interval</td>
</tr>
<tr>
<td>port {port_num} watchdog pingset retries set {num}</td>
<td>sets port watchdog ping retries</td>
</tr>
<tr>
<td>port {port_num} watchdog pingset retries show</td>
<td>shows port watchdog ping retries</td>
</tr>
<tr>
<td>port {port_num} watchdog retrybooting set {OFF=0</td>
<td>ON=1}</td>
</tr>
<tr>
<td>port {port_num} watchdog retrybooting show</td>
<td>shows port watchdog retry booting state</td>
</tr>
<tr>
<td>port {port_num} watchdog rebootset timeout</td>
<td>sets port watchdog retry boot timeout</td>
</tr>
</tbody>
</table>
Specifications

port {port_num} watchdog bootretries show  shows port watchdog retry boot timeout

radius enters cmd group "radius"

radius [PRIMARY=0|SECONDARY=1] enabled set <off=0/on=1> enables radius client

radius [PRIMARY=0|SECONDARY=1] enabled show  shows if radius client enabled

radius [PRIMARY=0|SECONDARY=1] server set "<dns_name>" sets radius server address

radius [PRIMARY=0|SECONDARY=1] server show  shows radius server address

radius [PRIMARY=0|SECONDARY=1] password set "<passwd>" sets radius server shared secret

radius [PRIMARY=0|SECONDARY=1] password hash set "<passwd>" sets radius server crypted shared secret

radius [PRIMARY=0|SECONDARY=1] auth timeout set {num_secs} sets server request timeout

radius [PRIMARY=0|SECONDARY=1] auth timeout show  shows server request timeout

radius [PRIMARY=0|SECONDARY=1] retries set {num} sets server number of retries

radius [PRIMARY=0|SECONDARY=1] retries show  shows server number of retries

radius chap enabled set <off=0/on=1> enables CHAP

radius chap enabled show  shows if CHAP is enabled

radius message auth set <off=0/on=1> enables request message authentication

radius message auth show  shows if request message authentication is enabled

radius default timeout set {num_secs} sets default session timeout (when not returned as Session-Timout Attribute)

radius default timeout show  shows default session timeout

snmp enters cmd group "snmp"

snmp port set {ip_port} sets SNMP UDP port

snmp port show  shows SNMP UDP port

snmp snmpget enabled set {OFF=0|ON=1} enables SNMP GET cmds on/off

snmp snmpget enabled show  shows if SNMP GET cmds are enabled

snmp snmpset enabled set {OFF=0|ON=1} enables SNMP SET cmds on/off

snmp snmpset enabled show  shows if SNMP SET cmds are enabled

snmp snmpv2 enabled set {OFF=0|ON=1} enables SNMP v2 on/off

snmp snmpv2 enabled show  shows if SNMP v2 is enabled

snmp snmpv2 public set "{text}" enables SNMP v3 on/off

snmp snmpv2 public show  shows if SNMP v3 is enabled

snmp snmpv2 private set "{text}" sets SNMP v2 public community

snmp snmpv2 private show  shows SNMP v2 private community

snmp snmpv3 enabled set {OFF=0|ON=1} sets SNMP v2 private community

snmp snmpv3 enabled show  shows SNMP v2 private community

snmp snmpv3 username set "{text}" sets SNMP v3 username

snmp snmpv3 username show  shows SNMP v3 username

snmp snmpv3 authalg set {NONE=0|MD5=1|SHA1=2|SHA256=3|SHA384=4|SHA512=5} sets SNMP v3 authentication

snmp snmpv3 authalg show  shows SNMP v3 authentication algorithm

snmp snmpv3 privalg set {NONE=0|DES=1|3DES=2|AES128=3|AES192=4|AES256=5|AES192*=6|AES256*=7} sets SNMP v3 privacy algorithm

snmp snmpv3 privalg show  shows SNMP v3 privacy algorithm

snmp snmpv3 authpasswd set "<passwd>" sets SNMP v3 authentication password

snmp snmpv3 privpasswd set "<passwd>" sets SNMP v3 privacy password

snmp snmpv3 authpasswd hash set "<passwd>" sets SNMP v3 authentication hashed password

snmp snmpv3 privpasswd hash set "<passwd>" sets SNMP v3 privacy hashed password

snmp trap type set {NONE=0|V1=1|V2=2|V3=3} sets type of SNMP traps

snmp trap type show  shows SNMP trap type

snmp trap receiver {trap_num} set "<dns_name>" sets address and port of SNMP trap receiver {trap_num}

snmp trap receiver {trap_num} show  shows address and port of SNMP trap receiver {trap_num}

syslog enters cmd group "syslog"

syslog enabled set {OFF=0|ON=1} enables syslog msgs on/off

syslog enabled show  shows if syslog enabled

syslog server set "<dns_name>" sets address of syslog server

syslog server show  shows address of syslog server

system enters cmd group "system"

system restart restarts device

system fabsettings restore fab settings and restart device

system bootloader enters bootloader mode

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Specifications

system flushdns
flush DNS cache

system uptime
number of seconds the device is running

system panel enabled set {OFF=0|ON=1}
blocks panel buttons when not enabled

system display enabled set {OFF=0|ON=1}
dark display when not enabled

system display enabled show
shows if display enabled

system display default extsensor {port_num}{7x01=0|7x02=1|7x03=2} set {sen_field}
sets default display to external sensor

system display default linesensor {line_num} set
sets default display to linesensor

system display default show
shows default display

timer
enters cmd group "timer"

timer enabled set {OFF=0|ON=1}
enables timer functions

timer enabled show
shows if timer a enabled

timer syslog facility set {0..23}
sets facility level for timer syslog

timer syslog facility show
shows facility level for timer syslog

timer syslog verbose set {0..7}
sets verbose level for timer syslog

timer syslog verbose show
shows verbose level for timer syslog

timer {rule_num} enabled set {OFF=0|ON=1}
enables rule

timer {rule_num} enabled show
shows if rule is enabled

timer {rule_num} name set "{name}"
sets name of rule

timer {rule_num} name show
shows name of rule

timer {rule_num} {FROM=0|UNTIL=1} set "{yyyy-mm-dd}"" sets date range of rule

timer {rule_num} trigger jitter set {0..65535}
sets jitter for rule

timer {rule_num} trigger jitter show
show jitter of rule

timer {rule_num} trigger random set {0..100}
sets probability for rule

timer {rule_num} trigger random show
shows rule probability

timer {rule_num} trigger {HOUR=0|MIN=1|SEC=2|DAY=3|MON=4|DOW=5} set "{time_date_list}"
sets time date list

timer {rule_num} trigger {HOUR=0|MIN=1|SEC=2|DAY=3|MON=4|DOW=5} show
shows time date list

timer {rule_num} action mode set {SWITCH=1|CLI=2}
sets switch or cli cmd

timer {rule_num} action mode show
shows if switch or cli cmd

timer {rule_num} action {SWITCH1=0|SWITCH2=1} (OFF=0|ON=1) set "{port_list}" sets port list for switch cmd

timer {rule_num} action {SWITCH1=0|SWITCH2=1} (OFF=0|ON=1) show
shows port list for switch cmd

timer {rule_num} action delay set {0..65535}
delay between cmds

timer {rule_num} action delay show
delay between cmd:

timer {rule_num} action console set "{cmd}"
sets cmd string

timer {rule_num} action console show
sets cmd string

timer {rule_num} action hash set "{data}" sets action binary form

timer {rule_num} action hash show
sets action binary form

timer {rule_num} delete
delete one timer

timer delete all
delete all timer

vt100
enters cmd group "vt100"

t100 echo set {OFF=0|ON=1}
sets console echo state

t100 echo show
shows console echo state

t100 numeric set {OFF=0|ON=1}
sets numeric mode

t100 numeric show
shows numeric mode state

t100 reset
resets terminal

Notes
1. Legacy - The command has been replaced by a newer version
2. Command can be entered on any level
3. The output may show 2 lines - the 1st line shows the actual state, the 2nd line the status after reboot
4. The output may show several lines
5. Please see the Energy Sensor Table for the right energy index
6. Please see the External Type and External Sensor Field Tables for the correct sensor index

Energy Sensor Table "{energy_sensor}"
Specifications

<table>
<thead>
<tr>
<th>Index</th>
<th>Description</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Forward Active Energy</td>
<td>Wh</td>
</tr>
<tr>
<td>1</td>
<td>Power Active</td>
<td>W</td>
</tr>
<tr>
<td>2</td>
<td>Voltage</td>
<td>V</td>
</tr>
<tr>
<td>3</td>
<td>Current</td>
<td>A</td>
</tr>
<tr>
<td>4</td>
<td>Frequency</td>
<td>0.01 hz</td>
</tr>
<tr>
<td>5</td>
<td>Power Factor</td>
<td>0.001</td>
</tr>
<tr>
<td>6</td>
<td>Power Angle</td>
<td>0.1 degree</td>
</tr>
<tr>
<td>7</td>
<td>Power Apparent</td>
<td>VA</td>
</tr>
<tr>
<td>8</td>
<td>Power Reactive</td>
<td>VAR</td>
</tr>
<tr>
<td>9</td>
<td>Forward Active Energy Resettable</td>
<td>Wh</td>
</tr>
<tr>
<td>10</td>
<td>Forward Reactive Energy</td>
<td>VARh</td>
</tr>
<tr>
<td>11</td>
<td>Forward Reactive Energy Resettable</td>
<td>VARh</td>
</tr>
<tr>
<td>12</td>
<td>Reset Time - sec. since last Energy Counter Reset</td>
<td>s</td>
</tr>
<tr>
<td>13</td>
<td>Reverse Active Energy</td>
<td>Wh</td>
</tr>
<tr>
<td>14</td>
<td>Reverse Reactive Energy</td>
<td>VARh</td>
</tr>
<tr>
<td>15</td>
<td>Reverse Active Energy Resettable</td>
<td>Wh</td>
</tr>
<tr>
<td>16</td>
<td>Reverse Reactive Energy Resettable</td>
<td>VARh</td>
</tr>
<tr>
<td>17</td>
<td>Absolute Active Energy</td>
<td>Wh</td>
</tr>
<tr>
<td>18</td>
<td>Absolute Reactive Energy</td>
<td>VARh</td>
</tr>
<tr>
<td>19</td>
<td>Absolute Active Energy Resettable</td>
<td>Wh</td>
</tr>
<tr>
<td>20</td>
<td>Absolute Reactive Energy Resettable</td>
<td>VARh</td>
</tr>
<tr>
<td>21</td>
<td>Residual Current</td>
<td>A</td>
</tr>
<tr>
<td>22</td>
<td>Neutral Current</td>
<td>A</td>
</tr>
<tr>
<td>23</td>
<td>Residual Current Type B RMS</td>
<td>A</td>
</tr>
<tr>
<td>24</td>
<td>Residual Current Type B DC</td>
<td>A</td>
</tr>
</tbody>
</table>

⚠ Whether the measured values “Residual Current” and “Neutral Current” are supported depends on the respective device model.

External Sensor Type Table "{sen_type}"

Constants "{7x01=0|7x04=0|7x02=1|7x05=1|7x06=2}"

<table>
<thead>
<tr>
<th>Index</th>
<th>Description</th>
<th>Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Temperature</td>
<td>7001, 7101, 7201</td>
</tr>
<tr>
<td>0</td>
<td>Temperature</td>
<td>7004, 7104, 7204</td>
</tr>
<tr>
<td>1</td>
<td>Temperature, Humidity</td>
<td>7002, 7102, 7202</td>
</tr>
<tr>
<td>1</td>
<td>Temperature, Humidity</td>
<td>7005, 7105, 7205</td>
</tr>
<tr>
<td>2</td>
<td>Temperature, Humidity, Air Pressure</td>
<td>7006, 7106, 7206</td>
</tr>
</tbody>
</table>

External Sensor Field Table "{sen_field}"

<table>
<thead>
<tr>
<th>Index</th>
<th>Description</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Temperature</td>
<td>°C</td>
</tr>
<tr>
<td>1</td>
<td>Humidity</td>
<td>%</td>
</tr>
<tr>
<td>2</td>
<td>Digital Input</td>
<td>bool</td>
</tr>
<tr>
<td>3</td>
<td>Air Pressure</td>
<td>hPa</td>
</tr>
<tr>
<td>4</td>
<td>Dew Point</td>
<td>°C</td>
</tr>
<tr>
<td>5</td>
<td>Dew Point Temperature Difference</td>
<td>°C</td>
</tr>
</tbody>
</table>

4.7.2 Console Cmd 8035

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
<th>Note</th>
</tr>
</thead>
</table>
### Specifications

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>logout</td>
<td>go to login prompt when enabled</td>
</tr>
<tr>
<td>quit</td>
<td>quits telnet session - nothing in serial console</td>
</tr>
<tr>
<td>back</td>
<td>back one cmd level</td>
</tr>
<tr>
<td>help</td>
<td>show all cmds from this level</td>
</tr>
<tr>
<td>help all</td>
<td>show all cmds</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>clock</td>
<td>enters cmd group &quot;clock&quot;</td>
</tr>
<tr>
<td>clock enabled</td>
<td>enables ntp</td>
</tr>
<tr>
<td>clock enabled show</td>
<td>shows if ntp enabled</td>
</tr>
<tr>
<td>clock timezone</td>
<td>sets timezone</td>
</tr>
<tr>
<td>clock timezone show</td>
<td>shows timezone</td>
</tr>
<tr>
<td>clock dst enabled</td>
<td>enables dst</td>
</tr>
<tr>
<td>clock dst enabled show</td>
<td>shows if dst is enabled</td>
</tr>
<tr>
<td>clock manual set</td>
<td>sets time and date manually</td>
</tr>
<tr>
<td>clock show</td>
<td>shows actual time and date</td>
</tr>
<tr>
<td>clock ntp server</td>
<td>sets ntp server name</td>
</tr>
<tr>
<td>clock ntp server show</td>
<td>shows ntp server name</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>console version</td>
<td>shows unique console version number</td>
</tr>
<tr>
<td>console telnet enabled</td>
<td>enables telnet on/off</td>
</tr>
<tr>
<td>console telnet enabled show</td>
<td>shows if telnet enabled</td>
</tr>
<tr>
<td>console telnet port set</td>
<td>sets telnet port</td>
</tr>
<tr>
<td>console telnet port show</td>
<td>shows telnet port</td>
</tr>
<tr>
<td>console telnet raw set</td>
<td>sets raw mode (disables editing) on/off</td>
</tr>
<tr>
<td>console telnet raw show</td>
<td>shows if raw mode enabled</td>
</tr>
<tr>
<td>console telnet echo set</td>
<td>enables echo on/off</td>
</tr>
<tr>
<td>console telnet echo show</td>
<td>shows if echo enabled</td>
</tr>
<tr>
<td>console telnet active neg set</td>
<td>enables telnet active negotiation (IAC) on/off</td>
</tr>
<tr>
<td>console telnet active neg show</td>
<td>shows if active negotiation enabled</td>
</tr>
<tr>
<td>console telnet login set</td>
<td>enables login on/off</td>
</tr>
<tr>
<td>console telnet login show</td>
<td>shows if login enabled</td>
</tr>
<tr>
<td>console telnet login local set</td>
<td>enables local login on/off</td>
</tr>
<tr>
<td>console telnet login local show</td>
<td>shows if local login enabled</td>
</tr>
<tr>
<td>console telnet login radius set</td>
<td>enables login for RADIUS on/off</td>
</tr>
<tr>
<td>console telnet login radius show</td>
<td>shows if RADIUS login enabled</td>
</tr>
<tr>
<td>console telnet login delay set</td>
<td>enables delay (after 3 login fails) on/off</td>
</tr>
<tr>
<td>console telnet login delay show</td>
<td>shows if login delay enabled</td>
</tr>
<tr>
<td>console telnet user set</td>
<td>sets login user name</td>
</tr>
<tr>
<td>console telnet user show</td>
<td>shows login user name</td>
</tr>
<tr>
<td>console telnet passwd set</td>
<td>sets login password</td>
</tr>
<tr>
<td>console telnet passwd show</td>
<td>shows login hashed password</td>
</tr>
<tr>
<td>console serial enabled set</td>
<td>enables serial console on/off</td>
</tr>
<tr>
<td>console serial enabled show</td>
<td>shows if serial console enabled</td>
</tr>
<tr>
<td>console serial raw set</td>
<td>sets raw mode (disables editing) on/off</td>
</tr>
<tr>
<td>console serial raw show</td>
<td>shows if raw mode enabled</td>
</tr>
<tr>
<td>console serial echo set</td>
<td>enables echo on/off</td>
</tr>
<tr>
<td>console serial echo show</td>
<td>shows if echo enabled</td>
</tr>
<tr>
<td>console serial kvm set</td>
<td>enables binary KVM cmds on serial port on/off</td>
</tr>
<tr>
<td>console serial kvm show</td>
<td>shows if binary KVM cmds enabled</td>
</tr>
<tr>
<td>console serial utf8 set</td>
<td>enables UTF8 support</td>
</tr>
<tr>
<td>console serial utf8 show</td>
<td>shows if UTF8 enabled</td>
</tr>
<tr>
<td>console serial login set</td>
<td>enables login on/off</td>
</tr>
<tr>
<td>console serial login show</td>
<td>shows if login enabled</td>
</tr>
<tr>
<td>console serial login local set</td>
<td>enables local login on/off</td>
</tr>
<tr>
<td>console serial login local show</td>
<td>shows if local login enabled</td>
</tr>
<tr>
<td>console serial login radius set</td>
<td>enables login for RADIUS on/off</td>
</tr>
<tr>
<td>console serial login radius show</td>
<td>shows if RADIUS login enabled</td>
</tr>
<tr>
<td>console serial login delay set</td>
<td>enables delay (after 3 login fails) on/off</td>
</tr>
<tr>
<td>console serial login delay show</td>
<td>shows if login delay enabled</td>
</tr>
<tr>
<td>console serial user set</td>
<td>sets login user name</td>
</tr>
<tr>
<td>console serial user show</td>
<td>shows login user name</td>
</tr>
<tr>
<td>console serial passwd set</td>
<td>sets login password</td>
</tr>
<tr>
<td>console serial passwd show</td>
<td>sets login hashed password</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>email</td>
<td>enters cmd group &quot;email&quot;</td>
</tr>
<tr>
<td>email enabled</td>
<td>enables email on/off</td>
</tr>
<tr>
<td>email enabled show</td>
<td>shows if email is enabled</td>
</tr>
<tr>
<td>email sender set</td>
<td>sets email sender address</td>
</tr>
<tr>
<td>email sender show</td>
<td>shows email sender address</td>
</tr>
<tr>
<td>email recipient set</td>
<td>sets email recipient address</td>
</tr>
<tr>
<td>email recipient show</td>
<td>shows email recipient address</td>
</tr>
<tr>
<td>email server set</td>
<td>sets email SMTP server address</td>
</tr>
<tr>
<td>email server show</td>
<td>shows email SMTP server address</td>
</tr>
<tr>
<td>email port set</td>
<td>sets email SMTP port</td>
</tr>
<tr>
<td>email port show</td>
<td>shows email SMTP port</td>
</tr>
</tbody>
</table>

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Specifications

e-mail security set {NONE=0|STARTTLS=1|SSL=2} sets SMTP connection security

e-mail security show shows SMTP connection security

e-mail auth set {NONE=0|PLAIN=1|LOGIN=2} sets email authentication

e-mail auth show shows email authentication

e-mail user set "[username]" sets SMTP username

e-mail user show shows SMTP username

e-mail passwd set "{passwd}" sets SMTP password

e-mail passwd hash set "{passwd}" sets encrypted SMTP password

e-mail testmail send test email

ethernet enters cmd group "ethernet"

ethernet mac show shows MAC address

ethernet link show shows ethernet link state

ethernet phyprefer set {10MBIT_HD=0|10MBIT_FD=1|100MBIT_HD=2|100MBIT_FD=3} sets preferred speed for PHY Auto Negotiation

ethernet phyprefer show shows preferred speed for PHY Auto Negotiation

extsensor enters cmd group "extsensor"

extsensor all show shows all values from connected external sensors

extsensor all show shows all plugged sensors and fields

extsensor (port_num) [sen_field] value show shows sensor value

extsensor (port_num) [sen_field] label set "[name]" sets sensor name to label

extsensor (port_num) [sen_field] label show shows label of sensor

extsensor (port_num) type show shows type of sensor

extsensor (port_num) [sen_field] events set {off=0|on=1} enables sensor events on/off

extsensor (port_num) [sen_field] events show shows if sensor events are enabled

extsensor (port_num) [sen_field] events type set {EVT_SYSLOG=0,EVT_SNMP=1,EVT_EMAIL=2,EVT_SMS=3,EVT_GSMEMAIL=4,EVT_BEEPER=5} enables different event types

extsensor (port_num) [sen_field] events type show shows what event types are enabled

extsensor (port_num) [sen_field] maxval set {num} sets maximum value for sensor

extsensor (port_num) [sen_field] maxval show shows maximum value for sensor

extsensor (port_num) [sen_field] minval set {num} sets minimum value for sensor

extsensor (port_num) [sen_field] minval show shows minimum value for sensor

extsensor (port_num) [sen_field] hystset {num} sets hysteresis value for sensor

extsensor (port_num) [sen_field] hystshow shows hysteresis value for sensor

extsensor (port_num) [sen_field] {BELOWMIN=0|ABOVEMIN=1|ABOVEMAX=2|BELOWMAX=3} port set {port_num} sets Port for Power Port Switching actions

extsensor (port_num) [sen_field] {BELOWMIN=0|ABOVEMIN=1|ABOVEMAX=2|BELOWMAX=3} port show shows Port for Power Port Switching actions

extsensor (port_num) [sen_field] {BELOWMIN=0|ABOVEMIN=1|ABOVEMAX=2|BELOWMAX=3} state set {OFF=0|ON=1|DISABLED=2} sets Port state for Power Port Switching actions

extsensor (port_num) [sen_field] {BELOWMIN=0|ABOVEMIN=1|ABOVEMAX=2|BELOWMAX=3} state show shows Port state for Power Port Switching actions

extsensor period set {24H=0|12H=1|2H=2|1H=3|30MIN=4} sets sensor Min/Max measurement period

extsensor period show shows sensor Min/Max measurement period

extsensor beeper set {OFF=0|ON=1} enables beeper sensor alarms

extsensor beeper show shows if beeper sensor alarms are enabled

http enters cmd group "http"

http server set {HTTP_BOTH=0|HTTPS_ONLY=1|HTTP_ONLY=2} enters cmd group "http"

http server show shows webserver accepting connection types

http port set {ip_port} sets http port

http port show shows http port

http portssl set {ip_port} sets https port

http portssl show shows https port

http ajax enabled set {OFF=0|ON=1} enables ajax autorefresh on/off
Specifications

http ajax enabled show  shows if ajax autorefresh enabled
http passwd enabled set {OFF=0|ON=1}  enables http password on/off
http passwd enabled show  shows if http password enabled
http passwd user set "(passwd)"  sets http user password
http passwd admin set "(passwd)"  sets http admin password
http passwd hash user set "(passwd)"  sets hashed http user password
http passwd hash admin set "(passwd)"  sets hashed http admin password

ip4
  enters cmd group "ip4"
  ip4 hostname set "(name)"  sets device hostname
  ip4 hostname show  shows device hostname
  ip4 address set "(ip_address)"  sets IPv4 address
  ip4 address show  shows IPv4 address
  ip4 netmask set "(ip_address)"  sets IPv4 netmask
  ip4 netmask show  shows IPv4 netmask
  ip4 gateway set "(ip_address)"  sets IPv4 gateway address
  ip4 gateway show  shows IPv4 gateway address
  ip4 dns set "(ip_address)"  sets IPv4 DNS server address
  ip4 dns show  shows IPv4 DNS server address
  ip4 dhcp enabled set {OFF=0|ON=1}  enables IPv4 DHCP on/off
  ip4 dhcp enabled show  shows IPv4 DHCP state

ip6
  enters cmd group "ip6"
  ip6 enabled set {OFF=0|ON=1}  enables IPv6 on/off
  ip6 enabled show  shows if IPv6 is enabled
  ip6 routadv enabled set {OFF=0|ON=1}  enables IPv6 router advertisement
  ip6 routadv enabled show  shows IPv6 router advertisement state
  ip6 dhcp enabled set {OFF=0|ON=1}  enables IPv6 DHCP on/off
  ip6 dhcp enabled show  shows if IPv6 DHCP is enabled
  ip6 address show  show all IPv6 addresses
  ip6 gateway show  show all IPv6 gateways
  ip6 dns show  show all IPv6 DNS server
  ip6 manual enabled set {OFF=0|ON=1}  enables manual IPv6 addresses
  ip6 manual enabled show  shows if manual IPv6 addresses are enabled
  ip6 manual address {1..4} set "(ip_address)"  sets manual IPv6 address
  ip6 manual address {1..4} show  shows manual IPv6 address
  ip6 manual gateway set "(ip_address)"  sets manual IPv6 gateway address
  ip6 manual gateway show  shows manual IPv6 gateway address
  ip6 manual dns {1..2} set "(ip_address)"  sets manual IPv6 DNS server address
  ip6 manual dns {1..2} show  shows manual IPv6 DNS server address

ipacl
  enters cmd group "ipacl"
  ipacl ping enabled set {OFF=0|ON=1}  enables ICMP ping on/off
  ipacl ping enabled show  shows if ICMP ping enabled
  ipacl enabled set {OFF=0|ON=1}  enable IP filter on/off
  ipacl enabled show  shows if IP filter enabled
  ipacl filter {ipacl_num} set "(dns_name)"  sets IP filter {ipacl_num}
  ipacl filter {ipacl_num} show  shows IP filter {ipacl_num}

linesensor
  enters cmd group "linesensor"
  linesensor all {field_list} show  enters energy sensors according field list of all line sensors
  linesensor (line_num) (energy_sensor) value show  shows energy sensor of given line
  linesensor (line_num) counter reset  resets energy metering counter
  linesensor (line_num) label set "(name)"  sets line meter to label
  linesensor (line_num) label show  shows label of line meter
  linesensor (line_num) (energy_sensor) events set {OFF=0|ON=1}  enables events on/off
  linesensor (line_num) {energy_sensor} events show  shows if events are enabled
  linesensor (line_num) (energy_sensor) events type set "{EVT_SYSLOG=0,EVT_SNMP=1,EVT_EMAIL=2,EVT_SMS=3,EVT_GSMEMAIL=4,EVT_BEEPER=5}"
  linesensor (line_num) (energy_sensor) events type show  shows what event types are enabled
  linesensor (line_num) (energy_sensor) maxval set {float}  sets maximum value for line meter
  linesensor (line_num) (energy_sensor) maxval show  shows maximum value for line meter
  linesensor (line_num) (energy_sensor) minval set {float}  sets minimum value for line meter
  linesensor (line_num) (energy_sensor) minval show  shows minimum value for line meter
  linesensor (line_num) (energy_sensor) hyst set {float}  sets hysteresis value for line meter
Specifications

```
linesensor {line_num} {energy_sensor} hyst show          shows hysterese value for line meter
linesensor {line_num} {energy_sensor}
{BELOWMIN=0|ABOVEMIN=1|ABOVEMAX=2|BELOWMAX=3} port set {port_num}
linesensor {line_num} {energy_sensor}
{BELOWMIN=0|ABOVEMIN=1|ABOVEMAX=2|BELOWMAX=3} port show
linesensor {line_num} {energy_sensor}
{BELOWMIN=0|ABOVEMIN=1|ABOVEMAX=2|BELOWMAX=3} state set (OFF=0|ON=1|DISABLED=2)
linesensor {line_num} {energy_sensor}
{BELOWMIN=0|ABOVEMIN=1|ABOVEMAX=2|BELOWMAX=3} state show
linesensor {line_num} events set {OFF=0|ON=1}          LEGACY - enables events on/off
linesensor {line_num} events show                       LEGACY - shows if events are enabled
linesensor {line_num} events type set
{EVT_SYSLOG=0,EVT_SNMP=1,EVT_EMAIL=2,EVT_SMS=3,EVT_GSMEMAIL=4,EVT_BEEPER=5} LEGACY - enables different event types
linesensor {line_num} maxval set {float}              LEGACY - sets maximum value for line meter
linesensor {line_num} minval set {float}              LEGACY - sets minimum value for line meter
linesensor {line_num} hyst set {float}                LEGACY - sets hysterese value for line meter
linesensor {line_num} events type show
linesensor {line_num} maxval show                      LEGACY - shows maximum value for line meter
linesensor {line_num} minval show                      LEGACY - shows minimum value for line meter
linesensor {line_num} hyst show                        LEGACY - shows hysterese value for line meter
linesensor {line_num} {BELOWMIN=0|ABOVEMIN=1|ABOVEMAX=2|BELOWMAX=3} port set {port_num}
linesensor {line_num} {BELOWMIN=0|ABOVEMIN=1|ABOVEMAX=2|BELOWMAX=3} port show
linesensor beeper set {OFF=0|ON=1}              enables beeper for line meter alarms
linesensor beeper show                                shows if beeper for line meter alarms is enabled
modbus enters cmd group "modbus"
modbus enabled set <off=0/on=1>        enables Modbus TCP support
modbus enabled show                                                  shows if Modbus is enabled
modbus port set <ip_port>                                                sets Modbus TCP port
modbus port show                                                        shows Modbus TCP port
port [port_num] state set {OFF=0|ON=1}                sets port to new state
port [port_num] state show                                         shows port state
port all state *[port_list]* {OFF=0|ON=1} sets several ports in one cmd - e.g. port all state set "1,3,5" 1
port [port_num] reset                                                starts reset sequence for port
port [port_num] toggle                                               toggles port
port [port_num] batch set {OFF=0|ON=1} wait
{num_secs} (OFF=0|ON=1)                                                  starts batch mode for port
port [port_num] batch cancel                                          cancels batch mode
port [port_num] label set *(name)*                                    sets port label name
port [port_num] label show                                            shows port label name
port [port_num] initstate coldstart set {OFF=0|ON=1|REMEMBER=2}             sets port coldstart initialization
port [port_num] initstate delay set {num}                           sets port init delay
port [port_num] initstate delay show                                   shows port init delay
port [port_num] repowerdelay set {num}                                sets port repower delay
port [port_num] repowerdelay show                                      shows port repower delay
port [port_num] resetime set {num}                                     sets port reset duration
port [port_num] resetime show                                          shows port reset duration
port [port_num] watchdog enabled set {OFF=0|ON=1}                     sets port watchdog to on/off
port [port_num] watchdog enabled show                                   shows port watchdog state
port [port_num] watchdog mode set {OFF=0|PORT_RESET=1|PORT_MS=2|PORT_MS_INV=3} sets port watchdog mode
port [port_num] watchdog mode show                                      shows port watchdog mode
<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>port {port_num} watchdog type set {WD_ICMP=0, WD_TCP=1}</code></td>
<td>sets port watchdog type</td>
</tr>
<tr>
<td><code>port {port_num} watchdog type show</code></td>
<td>shows port watchdog type</td>
</tr>
<tr>
<td><code>port {port_num} watchdog host set </code>{dns_name}`</td>
<td>sets port watchdog host target</td>
</tr>
<tr>
<td><code>port {port_num} watchdog host show</code></td>
<td>shows port watchdog host target</td>
</tr>
<tr>
<td><code>port {port_num} watchdog port set {ip_port}</code></td>
<td>sets port watchdog TCP port</td>
</tr>
<tr>
<td><code>port {port_num} watchdog port show</code></td>
<td>shows port watchdog TCP port</td>
</tr>
<tr>
<td><code>port {port_num} watchdog pinginterval set {num}</code></td>
<td>sets port watchdog ping interval</td>
</tr>
<tr>
<td><code>port {port_num} watchdog pinginterval show</code></td>
<td>shows port watchdog ping interval</td>
</tr>
<tr>
<td><code>port {port_num} watchdog pingretries set {num}</code></td>
<td>sets port watchdog ping retries</td>
</tr>
<tr>
<td><code>port {port_num} watchdog pingretries show</code></td>
<td>shows port watchdog ping retries</td>
</tr>
<tr>
<td>`port {port_num} watchdog retrybooting set {OFF=0</td>
<td>ON=1}`</td>
</tr>
<tr>
<td><code>port {port_num} watchdog retrybooting show</code></td>
<td>shows port watchdog retry booting state</td>
</tr>
<tr>
<td><code>port {port_num} watchdog bootretries set {num}</code></td>
<td>sets port watchdog retry boot timeout</td>
</tr>
<tr>
<td><code>port {port_num} watchdog bootretries show</code></td>
<td>shows port watchdog retry boot timeout</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>portsensor all {field_list} show</code></td>
<td>shows energy sensors according field list of all port sensors</td>
</tr>
<tr>
<td><code>portsensor {port_num} {energy_sensor} value show</code></td>
<td>shows energy sensor of given port</td>
</tr>
<tr>
<td><code>portsensor {port_num} {energy_sensor} maxval set {num}</code></td>
<td>sets maximum value for sensor</td>
</tr>
<tr>
<td><code>portsensor {port_num} {energy_sensor} maxval show</code></td>
<td>shows maximum value for sensor</td>
</tr>
<tr>
<td><code>portsensor {port_num} {energy_sensor} minval set {num}</code></td>
<td>sets minimum value for sensor</td>
</tr>
<tr>
<td><code>portsensor {port_num} {energy_sensor} minval show</code></td>
<td>shows minimum value for sensor</td>
</tr>
<tr>
<td><code>portsensor {port_num} {energy_sensor} hyst set {num}</code></td>
<td>sets hysteresis value for sensor</td>
</tr>
<tr>
<td><code>portsensor {port_num} {energy_sensor} hyst show</code></td>
<td>shows hysteresis value for sensor</td>
</tr>
<tr>
<td>`portsensor {port_num} {energy_sensor} {BELOWMIN=0</td>
<td>ABOVEMIN=1</td>
</tr>
<tr>
<td>`portsensor {port_num} {energy_sensor} {BELOWMIN=0</td>
<td>ABOVEMIN=1</td>
</tr>
<tr>
<td>`portsensor {port_num} {energy_sensor} events set {OFF=0</td>
<td>ON=1}`</td>
</tr>
<tr>
<td><code>portsensor {port_num} {energy_sensor} events show</code></td>
<td>LEGACY - shows if sensor events are enabled</td>
</tr>
<tr>
<td><code>portsensor {port_num} {energy_sensor} events type set </code>{EVT_SYSLOG=0,EVT_SNMP=1,EVT_EMAIL=2,EVT_SMS=3,EVT_GSMEMAIL=4,EVT_BEEPER =5}`</td>
<td>LEGACY - enables different event types</td>
</tr>
<tr>
<td><code>portsensor {port_num} {energy_sensor} maxval set {num}</code></td>
<td>LEGACY - sets maximum value for sensor</td>
</tr>
<tr>
<td><code>portsensor {port_num} {energy_sensor} maxval show</code></td>
<td>LEGACY - shows maximum value for sensor</td>
</tr>
<tr>
<td><code>portsensor {port_num} {energy_sensor} minval set {num}</code></td>
<td>LEGACY - sets minimum value for sensor</td>
</tr>
<tr>
<td><code>portsensor {port_num} {energy_sensor} minval show</code></td>
<td>LEGACY - shows minimum value for sensor</td>
</tr>
<tr>
<td><code>portsensor {port_num} {energy_sensor} hyst set {num}</code></td>
<td>LEGACY - sets hysteresis value for sensor</td>
</tr>
<tr>
<td><code>portsensor {port_num} {energy_sensor} hyst show</code></td>
<td>LEGACY - shows hysteresis value for sensor</td>
</tr>
<tr>
<td>`portsensor {port_num} {energy_sensor} {BELOWMIN=0</td>
<td>ABOVEMIN=1</td>
</tr>
<tr>
<td>`portsensor {port_num} {energy_sensor} {BELOWMIN=0</td>
<td>ABOVEMIN=1</td>
</tr>
</tbody>
</table>
Specifications

**portsensor** {port_num} {BELOWMIN=0|ABOVEMIN=1|ABOVEMAX=2|BELOWMAX=3} port show
LEGACY - shows port for sensor values action

**portsensor** {port_num} {BELOWMIN=0|ABOVEMIN=1|ABOVEMAX=2|BELOWMAX=3} state show
LEGACY - shows state for sensor values action

radius
enters cmd group "radius"

radius [PRIMARY=0|SECONDARY=1] enabled set <off=0/on=1>
enables radius client

radius [PRIMARY=0|SECONDARY=1] enabled show
shows if radius client enabled

radius [PRIMARY=0|SECONDARY=1] server set "<dns_name>"
sets radius server address

radius [PRIMARY=0|SECONDARY=1] server show
shows radius server address

radius [PRIMARY=0|SECONDARY=1] passwordset "{passwd}"
sets radius server shared secret

radius [PRIMARY=0|SECONDARY=1] passwordhash set "{passwd}"
sets radius server crypted shared secret

radius [PRIMARY=0|SECONDARY=1] auth timeout set {num_secs}
sets server request timeout

radius [PRIMARY=0|SECONDARY=1] auth timeout show
shows server request timeout

radius [PRIMARY=0|SECONDARY=1] retries set {num}
sets server number of retries

radius [PRIMARY=0|SECONDARY=1] retries show
shows server number of retries

radius chap enabled set <off=0/on=1>
enables CHAP

radius chap enabled show
shows if CHAP is enabled

radius message auth set <off=0/on=1>
enables request message authentication

radius message auth show
shows if request message authentication is enabled

radius default timeout set {num_secs}
sets default session timeout (when not returned as Session-Timout Attribute)

radius default timeout show
shows default session timeout

snmp
enters cmd group "snmp"

snmp port set {ip_port}
sets SNMP UDP port

snmp port show
shows SNMP UDP port

snmp snmpget enabled set {OFF=0|ON=1}
enables SNMP GET cmds on/off

snmp snmpset enabled show
shows if SNMP SET cmds are enabled

snmp snmpset enabled set {OFF=0|ON=1}
enables SNMP SET cmds on/off

snmp snmpset enabled show
shows if SNMP SET cmds are enabled

snmp snmpv2 enabled set {OFF=0|ON=1}
enables SNMP V2 on/off

snmp snmpv2 enabled show
shows if SNMP V2 is enabled

snmp snmpv2 public set "{"text}"*
enables SNMP v3 is enabled

snmp snmpv2 private set "{"text}"*
sets SNMP v2 private commnity

snmp snmpv2 private set {OFF=0|ON=1}
enables SNMP v2 private community

snmp snmpv2 enabled show
shows SNMP v2 private community

snmp snmpv3 username set "{"text}"*
sets SNMP v3 username

snmp snmpv3 username show
shows SNMP v3 username

snmp snmpv3 authalg set {NONE=0|MD5=1|SHA1=2|AES192=3|AES256=4|AES192*=5|AES256*=6}
sets SNMP v3 authentication

snmp snmpv3 authalg show
shows SNMP v3 authentication algorithm

snmp snmpv3 privalg set {NONE=0|DES=1|3DES=2|AES128=3|AES192=4|AES256=5|AES192*=6|AES256*=7}
sets SNMP v3 privacy algorithm

snmp snmpv3 privalg show
shows SNMP v3 privacy algorithm

snmp snmpv3 authpasswd set "{"passwd}"*
sets SNMP v3 authentication password

snmp snmpv3 privpasswd set "{"passwd}"*
sets SNMP v3 privacy password

snmp snmpv3 authpasswd hash set "{"passwd}"*
sets SNMP v3 authenticiation hashed password

snmp snmpv3 privpasswd hash set "{"passwd}"*
sets SNMP v3 privacy hashed password

snmp trap type set {NONE=0|V1=1|V2=2|V3=3}
sets type of SNMP traps

snmp trap type show
shows SNMP trap type

snmp trap receiver {trap_num} set "{"dns_name}"*
sets address and port of SNMP trap receiver (trap_num)

snmp trap receiver {trap_num} show
shows address and port of SNMP trap receiver (trap_num)

syslog
enters cmd group "syslog"

syslog enabled set {OFF=0|ON=1}
enables syslog msgs on/off

syslog enabled show
shows if syslog enabled

syslog server set "{"dns_name}"*
sets address of syslog server

syslog server show
shows address of syslog server
Specifications

**system**
- enters cmd group "system"
- system restart: restarts device
- system fabsettings: restore fab settings and restart device
- system bootloader: enters bootloader mode
- system flushdns: flush DNS cache
- system uptime: number of seconds the device is running
- system panel enabled: blocks panel buttons when not enabled
- system display enabled: shows if panel buttons are enabled
- system display default extsensor: sets default display to external sensor
- system display default linesensor: sets default display to linesensor
- system display default show: shows default display

**timer**
- enters cmd group "timer"
- timer enabled: enables timer functions
- timer enabled show: shows if timer is enabled
- timer syslog facility: sets facility level for timer syslog
- timer syslog verbose: sets verbose level for timer syslog
- timer {rule_num} enabled: enables rule
- timer {rule_num} enabled show: shows if rule is enabled
- timer {rule_num} name: sets name of rule
- timer {rule_num} name show: shows name of rule
- timer {rule_num} {FROM=0|UNTIL=1} set: sets date range of rule
- timer {rule_num} trigger jitter: sets jitter for rule
- timer {rule_num} trigger jitter show: shows jitter of rule
- timer {rule_num} trigger random: sets probability for rule
- timer {rule_num} trigger random show: shows rule probability
- timer {rule_num} action: sets switch or cli cmd
- timer {rule_num} action delay: sets delay between cmds
- timer {rule_num} action console: sets cmd string
- timer {rule_num} delete: delete one timer

**vt100**
- enters cmd group "vt100"
- vt100 echo: sets console echo state
- vt100 numeric show: sets numeric mode
- vt100 reset: resets terminal

**Notes**

1. Legacy - The command has been replaced by a newer version
2. Command can be entered on any level
3. The output may show 2 lines - the 1st line shows the actual state, the 2nd line the status after reboot
4. The output may show several lines
5. Please see the Energy Sensor Table for the right energy index
6. Please see the External Type and External Sensor Field Tables for the correct sensor index
### Energy Sensor Table "{energy_sensor}"

<table>
<thead>
<tr>
<th>Index</th>
<th>Description</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Forward Active Energy</td>
<td>Wh</td>
</tr>
<tr>
<td>1</td>
<td>Power Active</td>
<td>W</td>
</tr>
<tr>
<td>2</td>
<td>Voltage</td>
<td>V</td>
</tr>
<tr>
<td>3</td>
<td>Current</td>
<td>A</td>
</tr>
<tr>
<td>4</td>
<td>Frequency</td>
<td>0.01 hz</td>
</tr>
<tr>
<td>5</td>
<td>Power Factor</td>
<td>0.001</td>
</tr>
<tr>
<td>6</td>
<td>Power Angle</td>
<td>0.1 degree</td>
</tr>
<tr>
<td>7</td>
<td>Power Apparent</td>
<td>VA</td>
</tr>
<tr>
<td>8</td>
<td>Power Reactive</td>
<td>VAR</td>
</tr>
<tr>
<td>9</td>
<td>Forward Active Energy Resettable</td>
<td>Wh</td>
</tr>
<tr>
<td>10</td>
<td>Forward Reactive Energy</td>
<td>VARh</td>
</tr>
<tr>
<td>11</td>
<td>Forward Reactive Energy Resettable</td>
<td>VARh</td>
</tr>
<tr>
<td>12</td>
<td>Reset Time - sec. since last Energy Counter Reset</td>
<td>s</td>
</tr>
<tr>
<td>13</td>
<td>Reverse Active Energy</td>
<td>Wh</td>
</tr>
<tr>
<td>14</td>
<td>Reverse Reactive Energy</td>
<td>VARh</td>
</tr>
<tr>
<td>15</td>
<td>Reverse Active Energy Resettable</td>
<td>Wh</td>
</tr>
<tr>
<td>16</td>
<td>Reverse Reactive Energy Resettable</td>
<td>VARh</td>
</tr>
<tr>
<td>17</td>
<td>Absolute Active Energy</td>
<td>Wh</td>
</tr>
<tr>
<td>18</td>
<td>Absolute Reactive Energy</td>
<td>VARh</td>
</tr>
<tr>
<td>19</td>
<td>Absolute Active Energy Resettable</td>
<td>Wh</td>
</tr>
<tr>
<td>20</td>
<td>Absolute Reactive Energy Resettable</td>
<td>VARh</td>
</tr>
<tr>
<td>21</td>
<td>Residual Current</td>
<td>A</td>
</tr>
<tr>
<td>22</td>
<td>Neutral Current</td>
<td>A</td>
</tr>
<tr>
<td>23</td>
<td>Residual Current Type B RMS</td>
<td>A</td>
</tr>
<tr>
<td>24</td>
<td>Residual Current Type B DC</td>
<td>A</td>
</tr>
</tbody>
</table>

* Whether the measured values "Residual Current" and "Neutral Current" are supported depends on the respective device model.

### External Sensor Type Table "{sen_type}"

<table>
<thead>
<tr>
<th>Index</th>
<th>Description</th>
<th>Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Temperature</td>
<td>7001, 7101, 7201</td>
</tr>
<tr>
<td>0</td>
<td>Temperature</td>
<td>7004, 7104, 7204</td>
</tr>
<tr>
<td>1</td>
<td>Temperature, Humidity</td>
<td>7002, 7102, 7202</td>
</tr>
<tr>
<td>1</td>
<td>Temperature, Humidity</td>
<td>7005, 7105, 7205</td>
</tr>
<tr>
<td>2</td>
<td>Temperature, Humidity, Air Pressure</td>
<td>7006, 7106, 7206</td>
</tr>
</tbody>
</table>

### External Sensor Field Table "{sen_field}"

<table>
<thead>
<tr>
<th>Index</th>
<th>Description</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Temperature</td>
<td>°C</td>
</tr>
<tr>
<td>1</td>
<td>Humidity</td>
<td>%</td>
</tr>
<tr>
<td>2</td>
<td>Digital Input</td>
<td>bool</td>
</tr>
<tr>
<td>3</td>
<td>Air Pressure</td>
<td>hPa</td>
</tr>
<tr>
<td>4</td>
<td>Dew Point</td>
<td>°C</td>
</tr>
<tr>
<td>5</td>
<td>Dew Point Temperature Difference</td>
<td>°C</td>
</tr>
</tbody>
</table>
4.7.3 Serial Console

If the device has a serial port, the entire Telnet command set is also available at the serial console. Connect your PC to the device via an RS232 serial cable (9-pin RS232). To use the editing functions, the serial terminal must support VT100 emulation, and "echo" must not be activated. In the device configuration on the other hand, "Activate echo" should be set to "yes" and "Raw mode" to "no". Start your terminal program and select the COM port to which the RS232 cable is connected. Use the following settings for the serial port:

<table>
<thead>
<tr>
<th>Setting</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baudrate</td>
<td>115200</td>
</tr>
<tr>
<td>Databits</td>
<td>8</td>
</tr>
<tr>
<td>Parity</td>
<td>No</td>
</tr>
<tr>
<td>Stopbits</td>
<td>1</td>
</tr>
<tr>
<td>Flow Control</td>
<td>No</td>
</tr>
</tbody>
</table>

KVM Protocol

For compatibility reasons, the KVM protocol can be activated on the serial port. These binary control sequences can be used for devices with power ports, to turn the relays on and off individually.

Syntax:

\[ w \times x \times y \times z \]

- \( w \) prefix 0x80
- \( x \) command (0x31 to turn on, 0x32 for turning off)
- \( y \) port number (0x01 ... )
- \( z \) check byte, must be: \( \text{x xor y} \)

KVM Examples

<table>
<thead>
<tr>
<th>Port</th>
<th>Power On</th>
<th>Power Off</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0x80 0x31 0x01 0x30</td>
<td>0x80 0x32 0x01 0x33</td>
</tr>
<tr>
<td>2</td>
<td>0x80 0x31 0x02 0x33</td>
<td>0x80 0x32 0x02 0x30</td>
</tr>
<tr>
<td>12</td>
<td>0x80 0x31 0x0C 0x3D</td>
<td>0x80 0x32 0x0C 0x3E</td>
</tr>
</tbody>
</table>

4.8 Modbus TCP

If Modbus TCP is activated in the configuration, the ports (relays) can be switched and the following data is callable:

- State of Port (relay)
- State of DC input
- Number of ports (relays)
- Number of energy sensors
- Measured values of energy sensors
- Measured values of the external sensors
This chapter is general for all Gude devices. Depending on the device type, some ports or certain sensors are not available.

Address Range:

<table>
<thead>
<tr>
<th>Device Resource</th>
<th>Start</th>
<th>End</th>
<th>Modbus Data Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power/Output Ports</td>
<td>0x000</td>
<td>0x3ff</td>
<td>Coils</td>
</tr>
<tr>
<td>DC Inputs</td>
<td>0x400</td>
<td>0x7ff</td>
<td>Discrete Inputs</td>
</tr>
<tr>
<td>Info Area</td>
<td>0x000</td>
<td>0x005</td>
<td>Input Registers</td>
</tr>
<tr>
<td>External Sensors</td>
<td>0x100</td>
<td>0x1ff</td>
<td>Input Registers</td>
</tr>
<tr>
<td>Line Energy Sensors</td>
<td>0x400</td>
<td>0x39ff</td>
<td>Input Registers</td>
</tr>
<tr>
<td>Port Energy Sensors</td>
<td>0x3a00</td>
<td>0x6fff</td>
<td>Input Registers</td>
</tr>
</tbody>
</table>

These functions are supported:

- **Read Coils (0x01)**

  Reads the state of the ports (relay):

<table>
<thead>
<tr>
<th>Request Code</th>
<th>1 Byte</th>
<th>0x01</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starting Address</td>
<td>2 Bytes</td>
<td>0x000 to 0x3ff</td>
</tr>
<tr>
<td>Quantity of coils</td>
<td>2 Bytes</td>
<td>1 to 0x400</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Response Code</th>
<th>1 Byte</th>
<th>0x01</th>
</tr>
</thead>
<tbody>
<tr>
<td>Byte count</td>
<td>1 Byte</td>
<td>n</td>
</tr>
<tr>
<td>Coil Status</td>
<td>n Byte</td>
<td>each Bit represents a state</td>
</tr>
</tbody>
</table>

- **Read Discrete Inputs (0x02)**

  Reads state informations:

<table>
<thead>
<tr>
<th>Request Code</th>
<th>1 Byte</th>
<th>0x02</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starting Address</td>
<td>2 Bytes</td>
<td>0x400 to 0x7ff</td>
</tr>
<tr>
<td>Quantity of Inputs</td>
<td>2 Bytes</td>
<td>1 to 0x400</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Response Code</th>
<th>1 Byte</th>
<th>0x02</th>
</tr>
</thead>
<tbody>
<tr>
<td>Byte count</td>
<td>1 Byte</td>
<td>n</td>
</tr>
<tr>
<td>Input Status</td>
<td>n Byte</td>
<td>each Bit represents a state</td>
</tr>
</tbody>
</table>

- **Write Single Coil (0x05)**

  Sets the state of a port (relay):

<table>
<thead>
<tr>
<th>Request Code</th>
<th>1 Byte</th>
<th>0x05</th>
</tr>
</thead>
</table>

**Address Information**

- 0x400 to 0x7ff: State of passive device Inputs
- 0x800: Stop Condition active (ENC 2302)
- 0x801: POE active
- 0x1000 to 0x100f: State of Power Sources
Specifications

<table>
<thead>
<tr>
<th>Output Address</th>
<th>2 Bytes</th>
<th>0x00 to 0x3ff</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output Value</td>
<td>2 Bytes</td>
<td>0x0000 or 0xff00</td>
</tr>
<tr>
<td>Response Code</td>
<td>1 Byte</td>
<td>0x05</td>
</tr>
<tr>
<td>Output Address</td>
<td>2 Bytes</td>
<td>n</td>
</tr>
</tbody>
</table>

- **Write Multiple Coils (0x0F)**

Sets the state of several ports (relays):

<table>
<thead>
<tr>
<th>Request Code</th>
<th>1 Byte</th>
<th>0xF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starting Address</td>
<td>2 Bytes</td>
<td>0x00 to 0x3ff</td>
</tr>
<tr>
<td>Quantity of Outputs</td>
<td>2 Bytes</td>
<td>1 to 0x400</td>
</tr>
<tr>
<td>Byte count</td>
<td>1 Byte</td>
<td>n</td>
</tr>
<tr>
<td>Outputs Value</td>
<td>n x 1 Byte</td>
<td>each Bit represents a state</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Response Code</th>
<th>1 Byte</th>
<th>0xF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starting Address</td>
<td>2 Bytes</td>
<td>0x00 to 0x3ff</td>
</tr>
<tr>
<td>Quantity of Outputs</td>
<td>2 Bytes</td>
<td>1 to 0x400</td>
</tr>
</tbody>
</table>

- **Read Input Registers (0x04)**

Read 16-bit values that contain different device information depending on the address:

<table>
<thead>
<tr>
<th>Request Code</th>
<th>1 Byte</th>
<th>0x04</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starting Address</td>
<td>2 Bytes</td>
<td>0x0000 to 0xffff</td>
</tr>
<tr>
<td>Quantity of Inputs</td>
<td>2 Bytes</td>
<td>1 to 0x7d</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Response Code</th>
<th>1 Byte</th>
<th>0x04</th>
</tr>
</thead>
<tbody>
<tr>
<td>Byte count</td>
<td>1 Byte</td>
<td>2 x n</td>
</tr>
<tr>
<td>Input Status</td>
<td>n x 2 Byte</td>
<td>16-bit or 32-bit data</td>
</tr>
</tbody>
</table>

Various state information and measured values of the device are arranged in the input registers:

<table>
<thead>
<tr>
<th>Address</th>
<th>Width</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>16-bit</td>
<td>Number of Ports (Relay)</td>
</tr>
<tr>
<td>1</td>
<td>16-bit</td>
<td>Number of Ports with Energy Measurement</td>
</tr>
<tr>
<td>2</td>
<td>16-bit</td>
<td>Number of Banks</td>
</tr>
<tr>
<td>3</td>
<td>16-bit</td>
<td>Lines per Bank</td>
</tr>
<tr>
<td>4</td>
<td>16-bit</td>
<td>Phases per line</td>
</tr>
<tr>
<td>5</td>
<td>16-bit</td>
<td>Number of Inputs</td>
</tr>
<tr>
<td>0x100 to 0x1ff</td>
<td>16-bit (signed)</td>
<td>external Sensors</td>
</tr>
<tr>
<td>0x400 to 0x39ff</td>
<td>32-bit (signed)</td>
<td>Line Energy Sensors</td>
</tr>
<tr>
<td>0x3a00 to 0x6fff</td>
<td>32-bit (signed)</td>
<td>Port Energy Sensors</td>
</tr>
</tbody>
</table>

**External Sensors:**

The measured value of the external sensors are coded as fixed point arithmetic. For a factor of e.g. 0.1 in the unit the value must be divided by 10 in order to reach the real
measured value. A value of 0x8000 means that no sensor is plugged into the corresponding port, or the corresponding field in the sensor is not available. The formula for the address is (the port numbers start at zero):

$$0x100 + \text{Port} \times 8 + \text{Offset}$$

<table>
<thead>
<tr>
<th>Offset</th>
<th>Sensor Field</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Temperature</td>
<td>0.1 °C</td>
</tr>
<tr>
<td>1</td>
<td>Humidity</td>
<td>0.1 %</td>
</tr>
<tr>
<td>2</td>
<td>Digital Input</td>
<td>bool</td>
</tr>
<tr>
<td>3</td>
<td>Air Pressure</td>
<td>1 hPa (millibar)</td>
</tr>
<tr>
<td>4</td>
<td>Dew Point</td>
<td>0.1 °C</td>
</tr>
<tr>
<td>5</td>
<td>Dew Point Difference</td>
<td>0.1 °C</td>
</tr>
</tbody>
</table>

For example, the humidity of the second port has the address: 0x100 + 1 * 8 + 1 = 0x109

**Energy Sensors:**

We distinguish the line sensors (which correspond to the input circuits) and the port sensors, which measure the energy that is passed over the switched port. The measured values of the energy sensors are returned as signed 32-bit integers. The high-order 16-bits are starting on the even address, followed by the low-order 16-bits on the odd address. To calculate the address, there are the following formulas (the values for line, port and phase start at zero):

- **Line:** $0x0400 + \text{Line} \times 0x120 + \text{Phase} \times 0x60 + \text{Offset} \times 2$
- **Port:** $0x3a00 + \text{Port} \times 0x120 + \text{Phase} \times 0x60 + \text{Offset} \times 2$

⚠️ For devices with only one phase, the phase is set to zero in the formula.

**Examples:**

"Power Active" for 1st line sensor and 3rd phase: $0x400 + 0 \times 0x120 + 2 \times 0x60 + 1 \times 2 = 0x4C2$

"Voltage" for 2nd line sensor and single phase device: $0x400 + 1 \times 0x120 + 2 \times 2 = 0x524$

"Power Angle" for 4th port sensor and single phase device: $0x3a00 + 3 \times 0x120 + 6 \times 2 = 0x3d6c$

<table>
<thead>
<tr>
<th>Offset</th>
<th>Sensor Field</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Absolute Active Energy</td>
<td>Wh</td>
</tr>
<tr>
<td>1</td>
<td>Power Active</td>
<td>W</td>
</tr>
<tr>
<td>2</td>
<td>Voltage</td>
<td>V</td>
</tr>
<tr>
<td>3</td>
<td>Current</td>
<td>mA</td>
</tr>
<tr>
<td>4</td>
<td>Frequency</td>
<td>0.01 hz</td>
</tr>
<tr>
<td>5</td>
<td>Power Factor</td>
<td>0.001</td>
</tr>
<tr>
<td>6</td>
<td>Power Angle</td>
<td>0.1 degree</td>
</tr>
<tr>
<td>7</td>
<td>Power Apparent</td>
<td>VA</td>
</tr>
<tr>
<td>8</td>
<td>Power Reactive</td>
<td>VAR</td>
</tr>
<tr>
<td>9</td>
<td>Absolute Active Energy Resettable</td>
<td>Wh</td>
</tr>
<tr>
<td>10</td>
<td>Absolute Reactive Energy</td>
<td>VARh</td>
</tr>
<tr>
<td>11</td>
<td>Absolute Reactive Energy Resettable</td>
<td>VARh</td>
</tr>
<tr>
<td>12</td>
<td>Reset Time - sec. since last Energy Counter Reset</td>
<td>s</td>
</tr>
</tbody>
</table>
### Specifications

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>Forward Active Energy</td>
<td>Wh</td>
</tr>
<tr>
<td>14</td>
<td>Forward Reactive Energy</td>
<td>VARh</td>
</tr>
<tr>
<td>15</td>
<td>Forward Active Energy Resettable</td>
<td>Wh</td>
</tr>
<tr>
<td>16</td>
<td>Forward Reactive Energy Resettable</td>
<td>VARh</td>
</tr>
<tr>
<td>17</td>
<td>Reverse Active Energy</td>
<td>Wh</td>
</tr>
<tr>
<td>18</td>
<td>Reverse Reactive Energy</td>
<td>VARh</td>
</tr>
<tr>
<td>19</td>
<td>Reverse Active Energy Resettable</td>
<td>Wh</td>
</tr>
<tr>
<td>20</td>
<td>Reverse Reactive Energy Resettable</td>
<td>VARh</td>
</tr>
<tr>
<td>21</td>
<td>Residual Current Type A</td>
<td>mA</td>
</tr>
<tr>
<td>22</td>
<td>Neutral Current</td>
<td>mA</td>
</tr>
<tr>
<td>23</td>
<td>Residual Current Type B RMS</td>
<td>0.1 mA</td>
</tr>
<tr>
<td>24</td>
<td>Residual Current Type B DC</td>
<td>0.1 mA</td>
</tr>
</tbody>
</table>

Whether the measured values "Residual Current" and "Neutral Current" are supported depends on the respective device model. For measured values such as "Neutral Current", which are independent of the phase, the same value is returned for all phases.

- **Read Device Identification (0x2B / 0x0E)**

  Returns manufacturer name and device identification:

<table>
<thead>
<tr>
<th>Request Code</th>
<th>1 Byte</th>
<th>0x2b</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEI Type</td>
<td>1 Byte</td>
<td>0x0e</td>
</tr>
<tr>
<td>Read Dev ID code</td>
<td>1 Byte</td>
<td>0x01</td>
</tr>
<tr>
<td>Object Id</td>
<td>1 Byte</td>
<td>0x00</td>
</tr>
<tr>
<td>Response Code</td>
<td>1 Byte</td>
<td>0x2b</td>
</tr>
<tr>
<td>MEI Type</td>
<td>1 Byte</td>
<td>0x0e</td>
</tr>
<tr>
<td>Read Dev ID code</td>
<td>1 Byte</td>
<td>0x01</td>
</tr>
<tr>
<td>Conformity Level</td>
<td>1 Byte</td>
<td>0x01</td>
</tr>
<tr>
<td>More Follows</td>
<td>1 Byte</td>
<td>0x00</td>
</tr>
<tr>
<td>NextObjectID</td>
<td>1 Byte</td>
<td>0x00</td>
</tr>
<tr>
<td>Number of Objects</td>
<td>1 Byte</td>
<td>0x03</td>
</tr>
<tr>
<td>Object ID</td>
<td>1 Byte</td>
<td>0x00</td>
</tr>
<tr>
<td>Object Length</td>
<td>1 Byte</td>
<td>n1</td>
</tr>
<tr>
<td>Object Value</td>
<td>n1 Bytes</td>
<td>&quot;Company Id&quot;</td>
</tr>
<tr>
<td>Object ID</td>
<td>1 Byte</td>
<td>0x00</td>
</tr>
<tr>
<td>Object Length</td>
<td>1 Byte</td>
<td>n2</td>
</tr>
<tr>
<td>Object Value</td>
<td>n2 Bytes</td>
<td>&quot;Product Id&quot;</td>
</tr>
<tr>
<td>Object ID</td>
<td>1 Byte</td>
<td>0x00</td>
</tr>
<tr>
<td>Object Length</td>
<td>1 Byte</td>
<td>n3</td>
</tr>
<tr>
<td>Object Value</td>
<td>n3 Bytes</td>
<td>&quot;Product Version&quot;</td>
</tr>
</tbody>
</table>

### 4.9 Messages

Depending on adjustable events, various messages can be sent from the device. The following message types are supported:

- Sending of E-Mails
- SNMP Traps
Specifications

- Syslog messages

**E-Mail messages**

E-Mail messages are triggered by the following events:

- Turning on the device
- Switching of the Power Ports
- Loss / return of voltage
- Exceeding of the max / min values of attached sensors
- State change of digital sensor input ports
- Exceeding of max / min values of the measured power consumption
- Condition change of overvoltage protection

**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:

- Switching of the Power Ports
- Exceeding of the max / min values of attached sensors
- State change of digital sensor input ports
- Exceeding of max / min values of the measured power consumption
- Condition change of overvoltage protection

**Syslog messages**

Syslog messages are simple text messages that are sent via UDP to a syslog server. Under Linux, normally a syslog daemon is already running (e.g., 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
- Switching of the Power Ports
- Loss / return of voltage
- Exceeding of the max / min values of attached sensors
- State change of digital sensor input ports
- Exceeding of max / min values of the measured power consumption
- Condition change of overvoltage protection
Support
5 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.

5.1 Data Security

To provide the device with a high level of data security, we recommend the following measures:

- Check that the HTTP password is switched on.
- Set up your own HTTP password.
- Allow access to HTTP via SSL only.
- Authentication and encryption is activated in SNMPv3.
- SNMP v2 access is disabled.
- enable STARTTLS or SSL in the e-mail configuration.
- Archive configuration files securely.
- In the IP ACL, enter only the devices that require access to HTTP or SNMP.
- Because Telnet is unencrypted, only use it in a secure environment.
- Since Modbus TCP is not encrypted, only activate it in a secure environment.
- Activate "Message Authentication" in RADIUS.

When accessed from the Internet

- Use a randomized password with at least 32 characters.
- If possible, place the device behind a firewall.

5.2 Contact

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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
5.3 Declaration of Conformity

This product from the Expert Power Control 8031 / 8035 series is in conformity with the European directives for CE marking applicable to this product. The complete CE declaration of conformity for this product can be found on the website www.gude.info in the download section of the product.

5.4 FAQ

1. What can I do if the device is no longer accessible?
   
   • If the Status LED is red, the device has no connection to the switch. Unplug and plug the Ethernet cable. If the Status LED is still red, try other switches. If one uses no switch, but connects e.g. a laptop directly to the device, make sure you are using a crossover Ethernet cable.
   
   • If the status LED is orange for a longer time after unplugging and plugging the Ethernet cable, then DHCP is configured, but no DHCP server was found in the network. After a timeout, the last IP address is configured manually.
   
   • If there is a physical link (status LED is green) to the device, but you can not access the web server, bring the device into bootloader mode and search for it with GBL_Conf.exe. Then check the TCP-IP parameters and change them if necessary.
   
   • If the device is not found by GBL_Conf.exe in bootloader mode, you can reset the settings to factory defaults as the last option.

2. Why does it sometimes take so long to configure new SNMPv3 passwords on the website?

   The authentication methods "SHA-384" and "SHA-512" are calculated purely in software, and can not use the crypto hardware. On the configuration page, e.g. "SHA-512", needs up to 45 seconds to calculate the key.

3. Can you enter multiple e-mail recipients?

   • Yes. In the E-Mail configuration in the Recipient Address field, it is possible to enter multiple e-mail addresses separated by commas. The input limit is 100 characters.

4. Why did the MIB tables change after the firmware update?

   • Since the number of possible event types was increased, the previous trap design resulted in an excess of trap definitions: See Change in Trap Design.

5. Importing an older firmware

   • During a firmware update, old data formats are sometimes converted to new structures. If an older firmware is newly installed, the configuration data and the energy meters may be lost! If the device then does not run correctly, please restore the factory settings (e.g. from the Maintenance Page).
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