Expert Power Meter

The Energy Meter for IT environments
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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-serviceable parts. All repairs must be performed by factory trained service personnel.

Check that the power cords, plugs and sockets are in proper condition.

The device can be connected only to 230V AC (50 or 60 Hz) sockets.

Always plug the device into properly earthed power sockets.

The device is intended for indoor use only. Do NOT install them in an area where excessive moisture or heat is present.

Because of safety and approval issues it is not allowed to modify the device without our permission.

Please note the safety advises and manuals of connected devices, too.

The device is NOT a toy. It has to be used or stored out of range of children.

Packaging material is NOT a toy. 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.
Expert Power Meter (EPM) is a 19" device, that makes it possible to measure energy consumption for two channels.

It operates as an energy consumption meter and measures current, voltage and active/apparent power. All of these information can be requested by Ethernet or directly at the device.

The energy consumption meter measures the spent energy on two counters, one shows the total energy consumption since starting-up EPM, the other counter is resettable.
2. Hardware

2.1 Extent of delivery

Included in delivery are:
  • **Expert Power Meter (EPM)**
  • Power supply cable (IEC)
  • CD-ROM containing Software and Manual

2.2 Starting up the device

1.) Connect the power supply cable to the **EPM** Power Connector on the back side of **Expert Power Meter**.

Your **EPM** is now booting and shortly after ready for being connected to consumers and the Ethernet.

2.) Plug the Ethernet cable into the connector on the front side of **EPM**.

3.) Connect the power cable of one or both consumers to the power-out connectors on the back side of **EPM**.

If a consumer is active, **EPM** will automatically start to count the energy consumption.

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**Figure 1 Front side**

1. 2-line LCD-Display
2. Channel 1 LED
3. Channel 2 LED
4. Alarm LED
5. Ethernet Connector
6. Button „select“
7. Button „ok“
8. Status LED
9. EPM Power Connector (10A)
10. 2 x Consumer Power Connector (10 A)

**Figure 2 Back side**
2.3 LCD-Panel

While booting up the device, the product name, the version of the firmware and the IP address of EPM are visible:

- Product name (A) and version of the firmware (B)
- IP address (B) of EPM

![Powermeter V1.2 192.168.0.2]

After booting up energy consumption counters for both client channels are displayed:

- Channel 1 counter (D)
- Channel 2 counter (E)

![kWh1 000,000 kWh2 000,000]

2.4 Status LED

The Status LED (8) shows different states of the device:

- Status LED red: Device is not connected to the ethernet
- Status LED orange: Device is connected to the ethernet, TCP/IP settings are not allocated
- Status LED green: Device is connected to the ethernet, TCP/IP settings allocated, device is ready to use
- Status LED blinks alternately red and green: Device is in Bootloader mode.
3. Configuration

3.1 Automatic configuration by using DHCP

After power-up, **EPM** looks for a DHCP server in the network and requests a free IP address from this server. Please check at your DHCP server, which IP address was provided to **EPM** and make sure, that this IP address will be reserved.

3.2 Configuration by using **Gbl_Conf.exe**

To change the TCP/IP settings of your **EPM** you need the tool **Gbl_Conf.exe**. This tool can be found on the CD-ROM or is free to download from our website [www.gude.info](http://www.gude.info).

Additionally you can update the firmware, deactivate passwords and IP ACL and set **EPM** back to default settings, when you use this tool (see more in chapter 5).

To check the current configuration, please choose your **EPM** from the list in the left window.

If the displayed IP address is the default IP address (192.168.0.2) no DHCP server is located in your network or it was not possible to provide a free IP address to **EPM**.

In this case, activate the bootloader mode of **EPM** and enter a valid IP address and the network mask. Save your configuration: *Program Device→Save Config*.

Deactivate the bootloader mode of **EPM**. Then choose *Search→All Devices* to refresh the status of **Gbl_Conf.exe**.

Now **Gbl_Conf.exe** shows the updated TCP/IP configuration of **EPM**.

![Figure 3 Gbl_Conf.exe](image-url)
3.3 Configuration by using the Webinterface

Open your Browser. Enter the IP address of **EPM**, to connect with it:

\[
\text{http://"IP-Address of EPM"/}
\]

and Login.

*To enter the configuration menu, click on „Configuration“ on the upper left side of the screen.*

**Configuration - Channels**

**Channel 1/Channel 2**
Shows the energy consumption (kWh) since the last counter-reset for this channel.

**Channel 1 total/Channel 2 total**
Shows the energy consumption (kWh) since power up for this channel.

**Reset Channel 1/Reset Channel 2**
Click on the button to reset the counter of this channel.
Configuration - IP Address

Hostname
Enter the host name of EPM. EPM uses this name to connect with DHCP server.

Special signs may destabilize your network.

IP Address
Here you can change the IP address of EPM.

Netmask
Here you can change the netmask of EPM.

Gateway
Here you can change the standard gateway of EPM.

Use DHCP
Here you can set, if EPM shall get its TCP/IP settings directly from your DHCP server. If DHCP is activated, EPM proves if a DHCP server is active inside of your LAN. Then EPM requests TCP/IP settings from this server. If there is no DHCP server inside of your network, we recommend to deactivate this function.
Configuration IP ACL

Reply ICMP-Ping requests
Here you can set, if EPM shell react on pings.

Enable IP Filter
Here you can activate the IP Access Control List (IP ACL) of EPM.

If you locked yourself out by mistake, please activate the bootloader mode of EPM, start Gbl_Conf.exe and deactivate IP ACL.

If IP ACL is active, DHCP and SNMP only work, if all necessary servers and clients are registered in this List.
Configuration - HTTP

HTTP Port
Here you can enter the HTTP port number, if necessary. Possible numbers are 1 .. 65534 (standard: 80). To get access to EPM, you have to enter the port number behind the IP address of EPM:
http://192.168.0.2:1720/

Require HTTP Password
If it is required, you can activate a password request. Then you have to enter two passwords, one administrator password and one user password. Each password has a maximum length of 15 signs. If an administrator password is active you can log in to change settings only with this password. User are able to log in with the user password to see the monitor information.

If you have forgotten your password, activate the bootloader mode of EPM, start Gbl_Conf.exe and deactivate the password request.
Configuration - SNMP

Enable SNMP-get
Here you can activate SNMP of EPM

SNMP public community
Here you can enter the SNMP community public

Download SNMP-MIB
Here you can download the MIB of EPM.

Use SNMP only if your network is fitted for. More information about the SNMP functions of EPM, you can find in chapter 3.6, on http://www.gude.info/wiki or ask our support team.

Configuration - Syslog

Use Syslog
Here you can activate syslog of EPM.

Syslog Server IP
If syslog is active enter here the IP address of your syslog server.

Syslog Port
If syslog is active enter here the port number, that your syslog server uses to receive syslog information.
3.4 IP Access Control List

IP Access Control List (IP ACL) acts as an IP filter for EPM. Whether it is active hosts and subnets only can contact EPM, if their IP addresses are stated in this IP ACL.

E.g.: "http://192.168.0.1" or "http://192.168.0.1/24"

If you locked yourself out by mistake, please activate the bootloader mode of EPM, start Gbl_Conf.exe and deactivate IP ACL.

You can find more information about configuration of IP ACL in chapter 3.3 or have a look at www.gude.info/wiki.

3.5 SNMP

To get detailed status information of EPM SNMP can be used. SNMP communicates via UDP (port 161) with EPM:

Supported SNMP commands:
- SNMPGET: request status information
- SNMPGETNEXT: request the next status information

You will need a Network Management System, e.g. HP-Open View, OpenNMS, Nagios etc., or the command line tools of NET-SNMP to request information of EPM via SNMP.

SNMP Communities

SNMP authenticates requests by so called communities. The public community has to be added to SNMP-read-requests and the private community to SNMP write requests. You can see the SNMP communites like read/write passwords. SNMP v1 and v2 transmit the communities without encryption. Therefore it is simple to spy out these communities. We recommend to use a DMZ or IP ACL.
MIBs

All information, that can be requested or changed, the so called „Managed Objects“, are described in „Management Information Bases“ (MIBs).

There are three MIBs, which can be requested from EPM: „system“, „interface“ and „gadsepm“
„system“ and „interface“ are standardised MIBs (MIB-II).
„gadsepm“ (GUDEADS-EPM-MIB=“gadsepm“) was created especially for EPM.
At least, there are so called Object Identifiers (OID) subordinated to those three structures. An OID describes the location of an information inside a MIB.

You can find more information about configuration of SNMP in chapter 3.3 or have a look at www.gude.info/wiki.

3.6 Syslog

Syslog messages are simple text messages transmitted to a syslog server using UDP.
Linux OS regularly have a syslog daemon installed, e.g. syslog-ng. For Windows there are some freeware tools available.

On following events, EPM will send a syslog message:
- Booting up
- Switching off
- Activation/deactivation of syslog
- Load more than 10 A, load again less than 10 A

You can find more information about configuration of Syslog in chapter 3.3 or have a look at www.gude.info/wiki.
4. Operating

4.1 Operating at the device

To switch the device directly you can use the buttons „select“ and „ok“ on the front side. With „select“ you are able to switch between several menu items, to select one of them press the button „ok“. (see Figure 11)
4.2 Controlling EPM by webinterface

Open your Browser. Enter the IP address of EPM, to connect with it:

http://"IP-Address of EPM"/

and Login.

**Expert Power Meter - Status**

**Channel**
Shows the energy consumption (kWh) since the last counter reset for this channel.

**Channel total**
Shows the energy consumption (kWh) since power-up for this channel.

**Active Power**
Shows the current active power (W) of the consumer connected to this channel.

**Apparent Power**
Shows the current apparent power (VA) of the consumer connected to this channel.

**Current**
Shows the current (A) of this channel.
5. Product Features

5.1 Bootloader mode

To activate the Bootloader mode of your EPM press the buttons „select“ and „ok“ simultaneously for three seconds. Whether EPM is in Bootloader mode, you can see by using the Gbl_Conf.exe: „BOOT-LDR“ is added to the host name of your EPM. Moreover the status LED blinks regularly and the following information is shown on the LCD-Panel:

While your EPM is in Bootloader mode you can update the firmware, deactivate IP ACL and passwords and reset the device to fab settings.

To deactivate the Bootloader mode, press the buttons „select“ and „ok“ again simultaneously for three seconds.

5.2 Firmware update

To update the firmware of EPM, you need the software tool Gbl_Conf.exe and an up-to-date version of the firmware.

Activate the Bootloader mode of EPM and choose it in Gbl_Conf.exe. Now execute Program Device→Firmware Update, choose the location of the new firmware and confirm.

The up-to-date versions of the firmware and Gbl_Conf.exe can be downloaded from our website www.gude.info.
5.3 Technical information

Connections: Ethernet (RJ45)
2 Power Ports (IEC C13, 10A)
EPM Power-inlet (Plug IEC C14, 10A)

Network: 10 MBit 10baseT Ethernet
Protocols: TCP/IP, HTTP, SNMP, Syslog
Power: 230 V, 10A
Temperature: 0°C-50°C
Dimensions: 19", 1 ru

5.4. Default Settings

In order to restore the default settings bootloader mode of EPM must be activated (see 5.1). Besides that the program Gbl_Conf.exe is required.

Run Gbl_Conf.exe and select the EPM whose settings should be restored. Then click on Program Device→Reset to Fab default.

Please notice that all current settings will be deleted. The default settings will be loaded when EPM’s bootloader mode is deacti-

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**Default Settings EPM**

<table>
<thead>
<tr>
<th>Name</th>
<th>EPMeter</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP address</td>
<td>192.168.0.2</td>
</tr>
<tr>
<td>Netmask</td>
<td>255.255.255.0</td>
</tr>
<tr>
<td>Gateway</td>
<td>192.168.0.0</td>
</tr>
<tr>
<td>DHCP</td>
<td>enabled</td>
</tr>
<tr>
<td>Password</td>
<td>disabled</td>
</tr>
<tr>
<td>IP ACL</td>
<td>disabled</td>
</tr>
<tr>
<td>HTTP Port</td>
<td>80</td>
</tr>
</tbody>
</table>
6. Support

More information, current drivers and software can be found on \textit{http://www.gude.info}.

In case of further questions, about installation or operation of \textbf{EPM}, please have a look at \textit{www.gude.info/wiki} and do not hesitate to contact our support (\texttt{mail@gude.info}).
Die Firma / The manufacturer

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Mail: mail@gude.info

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

Produktkennzeichnung / Product name

Expert Power Meter
Energieverbrauchszähler für 2 Kanäle im 19" Gehäuse mit Ethernetschnittstelle

mit den Bestimmungen der nachstehenden EU-Richtlinien übereinstimmen / are in accordance with the following european directives

Referenz-Nummer / Reference no. | Titel / Title
--- | ---
73/23/EWG / 73/23/EEC | Niederspannungsrichtlinie / Low Voltage Electrical Equipment
93/68/EWG / 93/68/EEC | CE Kennzeichnung / CE marking

und dass die nachstehenden Europäischen Normen zur Anwendung gelangt sind. / and comply with the following european standards.

Norm / Standard | Titel / Title
--- | ---
EN 55022:1998 + A1, A2 | Information technology equipment: Radio disturbance characteristics - Limits and methods of measurement
EN 55024:1998 + A1, A2 | Information technology equipment: Immunity characteristics - Limits and methods of measurement
EN 61000-3-2:2000 | Elektromagnetische Verträglichkeit Teil 3-2: Grenzwerte - Grenzwerte für Oberschwingungsströme
EN 61000-3-2:2000 | Electromagnetic compatibility Part 3-2 : Limits – Limits for harmonic current emissions
EN 60950:2000 | Sicherheit von Einrichtungen der Informationstechnik
EN 60950:2000 | Safety for Industrial Control Equipment

Köln, 21.09.2007

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