Expert Power Meter

The Energy Meter for IT environments

GUDE
ANALOG – und
DIGITALSYSTEME
GmbH

Manual

Manual **Expert Power Meter**

Rev. 1.1

Inhalt

Security Advise 2

1. Description 3

2. Hardware 4
   - 2.1 Extent of delivery 4
   - 2.2 Starting up the device 4
   - 2.3 LCD-Panel 5
   - 2.4 Status LED 5

3. Configuration 6
   - 3.1 Automatic configuration by using DHCP 6
   - 3.2 Configuration by using Gbl_Conf.exe 6
   - 3.3 Configuration by using the Webinterface 7
   - 3.4 IP Access Control List 12
   - 3.5 SNMP 12
   - 3.6 Syslog 13

4. Operating 14
   - 4.1 Operating at the device 14
   - 4.2 Controling EPM by webinterface 15

5. Product Features 16
   - 5.1 Bootloader mode 16
   - 5.2 Firmware update 16
   - 5.3 Technical information 17
   - 5.4. Default Settings 17

6. Support 18

Declaration of CE conformity 19

Contact 20

Security Advise

The device must be installed only by qualified personnel accord-

ing 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 factorytrained 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 or 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.

1. Description

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.

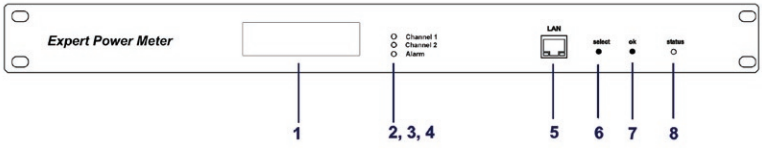


Figure 1 Front side

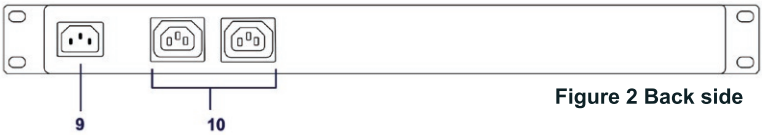


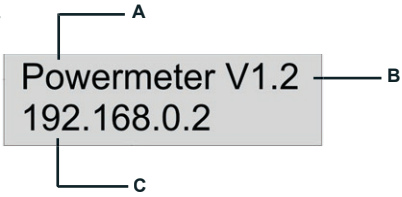
Figure 2 Back side

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)

2.3 LCD-Panel

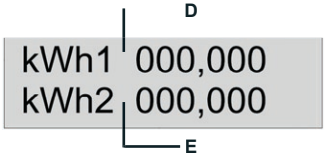
While booting up the device, the product name, the version of the firmware and the IP address of **EPM** are visible:

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



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

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



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*.

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**.

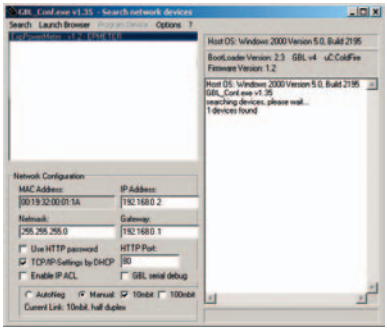


Figure 3 *Gbl_Conf.exe*

3.3 Configuration by using the Webinterface

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

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

Figure 4 Log in

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.

Figure 5 Configuration - Channels

Configuration - IP Address

Figure 6 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.

Figure 7 Configuration 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.

Figure 8 Configuration - HTTP

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

Configuration - SNMP

Figure 9 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 you syslog server.

Syslog Port

If syslog is active enter here the port number, that your syslog server uses to receive syslog information.

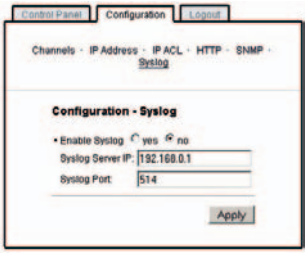


Figure 10 Configuration - Syslog

3.4 IP Access Control List

IP Access Control List (IP ACL) acts as an IP filter for **EPM**. Wether it is active hosts and subnets only can contact **EPM**, if their IP adresses 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 boot-loader 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 authentifies 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 descripted 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)

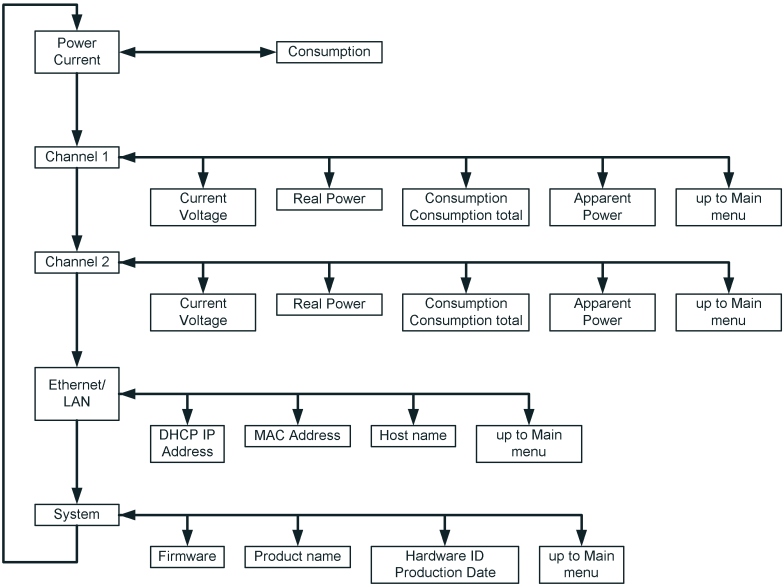


Figure 11 Menu

4.2 Controling EPM by webinterface

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

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

Figure 12 Login

and Login.

Expert Power Meter - Status

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

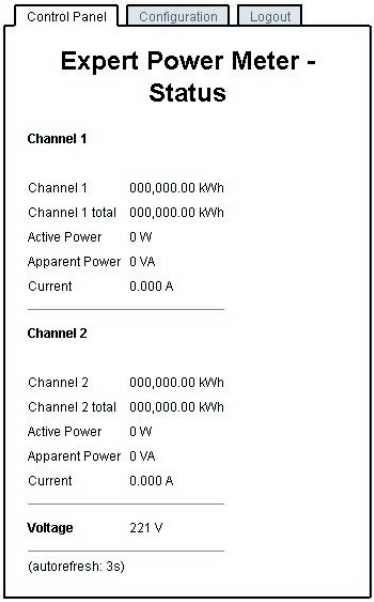
Channel total
Shows the energy consumption (kWh) since power-up for this channel.

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.

Figure 13 Status



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:

Bootloader V X.X
„Current IP Address“

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)
Netweork:	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 deactivated.

Default Settings EPM

Name:	EPMeter
IP address:	192.168.0.2
Netmask:	255.255.255.0
Gateway:	192.168.0.0
DHCP:	enabled
Password:	disabled
IP ACL:	disabled
HTTP Port:	80

6. Support

More information, current drivers and software can be found on *http://www.gude.info*.

In case of further questions, about installation or operation of **EPM**, please have a look at *www.gude.info/wiki* and do not hesitate to contact our support (*mail@gude.info*).

Konformitätserklärung / Declaration of Conformity

Die Firma / The manufacturer

Gude Analog- und Digitalsysteme GmbH

Anschrift/Address: Eintrachtstr. 113, 50668 Köln
Telefon/Phone: 0221 – 912 90 97 **Fax:** 0221 – 912 90 98
Web: www.gude.info **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
89/336/EWG / 89/336/EEC	Elektromagnetische Verträglichkeit / Electromagnetic Compatibility
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	Einrichtungen der Informationstechnik: Funkstöreigenschaften – Grenzwerte und Messverfahren
EN 55022:1998 + A1, A2	Information technology equipment: Radio disturbance characteristics - Limits and methods of measurement
EN 55024:1998 + A1, A2	Einrichtungen der Informationstechnik: Störfestigkeitseigenschaften – Grenzwerte und Prüfverfahren
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

Dr. Michael Gude, Geschäftsführer / CEO

GUDE ANALOG – und DIGITALSYSTEME GmbH
Eintrachtstr. 113, 50668 Köln
Tel.: 0221 / 912 90 97
Fax: 0221 / 912 90 98
www.gude.info - info@gude.info

Contact

Gude Analog- und Digitalsysteme GmbH
Eintrachtstrasse 113
50668 Koeln

Tel.: +49-221-912 90 97
Fax: +49-221-912 90 98

E-Mail: info@Gude.info
Web: www.Gude.info