

# HWg-PWR 3/12/25

## MANUAL



## Package contents

A complete shipment contains the following items:

- HWg-PWR25 (HWg-PWR12) unit
- Printed manual + datasheet

## Safety information

The device complies with regulations and industrial standards in force in the Czech Republic and the European Union. The device has been tested and is supplied in working order. To keep the device in this condition, it is necessary to adhere to the following safety and maintenance instructions.

**HWg-PWR connects directly to a 230VAC supply; therefore, it should be installed by qualified personnel only!**

**Using the device in a manner other than prescribed by the manufacturer may cause its safeguards to fail!**

**The power supply outlet or disconnection point must be freely accessible.**

**The device must not be used under any of the following conditions:**

- The device is noticeably damaged
- The device does not function properly
- Unfastened parts can move inside the device
- The device has been exposed to moisture or rain
- The device has been serviced by unauthorized personnel
- The power adapter or power supply cable are noticeably damaged
- If the device is used in a manner other than designed for, the protection provided by the device may fail.
- The local electrical system must include a power switch or a circuit breaker and overcurrent protection.

If you have any problems with installing or operating the device, please contact technical support:

**HW group s.r.o.**

<http://www.hw-group.com>

Email: [support@HWg.cz](mailto:support@HWg.cz)

U Pily 3

143 00 Praha 4

Czech Republic

Tel. +420 222 511 918

When contacting technical support, please keep at hand the exact type of your device (at the type plate) and, if possible, the firmware version (see later in this manual).

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## What is HWg-PWR 3 / 12 / 25

The HWg-PWR is an Ethernet-enabled device for remote monitoring and metering of electricity, heat, water or gas consumption using electricity, water, gas, heat, or other meters equipped with the M-Bus interface. In addition to metering, the device also supports alarming through e-mail or SNMP traps whenever allowed values are exceeded.

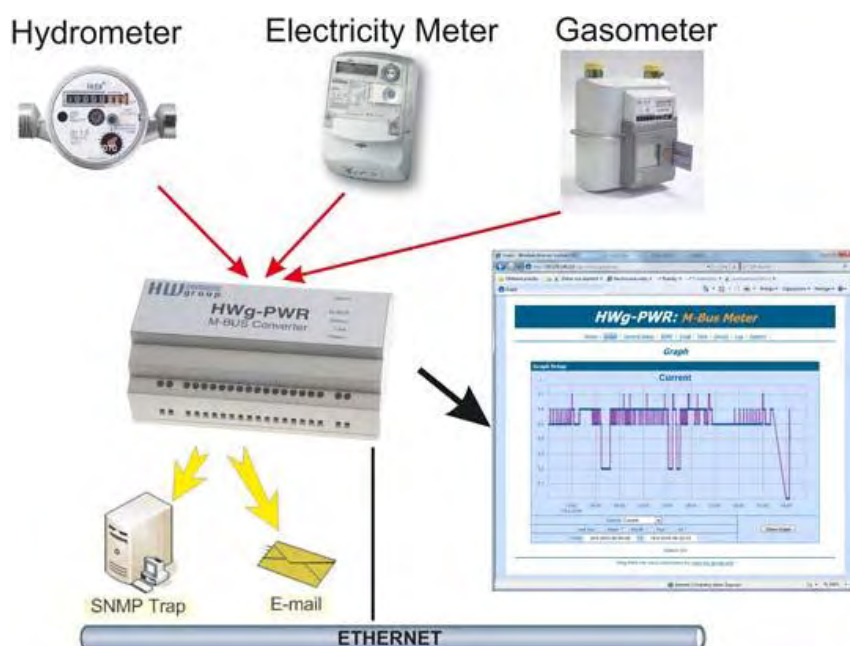
HWg-PWR is designed for remote reading of values from meters equipped with the M-Bus interface. Each meter can provide multiple variables, depending on the meter type and model. Typically, electricity meters provide the total electricity consumption and also the immediate value at the time of reading, line voltage and/or line current; water meters indicate total water consumption as well as immediate consumption or liquid flow rate; and so on.

**Note:** HWg-PWR is designed to be universal; hence, all discovered values are read out from every connected meter, until a specified limit is reached. To improve user comfort, it is possible to enable or disable each discovered value (disabled value is hidden from view), and to turn on or off the recording of measured readings for each enabled value (in order to increase the available recording time for the remaining values).

The M-Bus protocol also allows reading value names, units of measurement, or tariff information from the meters. The user can customize all of these data (e.g. change the unit of measurement or its exponent).

### Usage examples

- Remote monitoring of electricity meters in small server rooms and BTS
- Monitoring of energy consumption in rented premises
- Reading out energy consumption in remote or inaccessible areas
- Control over energy costs
- Checking for individual line overloads in three-phase wirings
- Checking for undervoltage in electric wirings
- Monitoring the flow of liquids

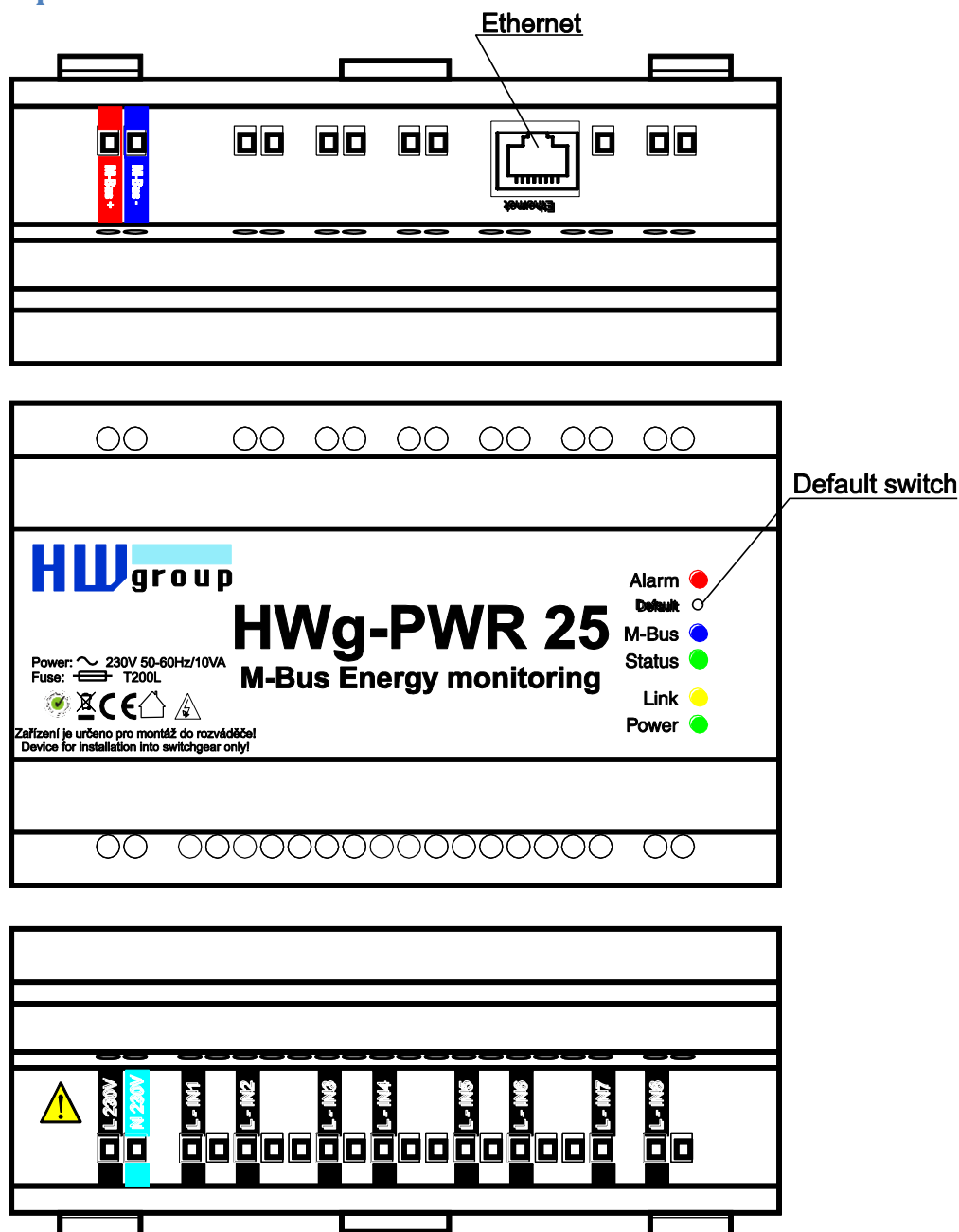


## Basic features of HWg-PWR 3 / 12 / 25

- **Ethernet:** RJ45 (100BASE-TX)
- **WEB:** Embedded WEB server / GUI
- **M-Bus meters:** up to 3 / 12 / 25 M-BUS meters (electricity, gas, ...)
- **Various values:** up to 100 various values (independent from the connected meters)
- Automatic detection of meters and supported values
- **8x 110/230V voltage inputs** (phase detection - common PE) for any use
- **Logging of measured values & plot charts:** Logs up to 170,000 values
- Configuration of allowed ranges for measured values
- Configuration of the unit of measurement and the exponent
- Conversion of measured values to currency
- Supports M-Bus primary and secondary addressing
- Configuration of remote primary M-Bus address
- **Periodic submission of measured values** over HTTP (HWg-PUSH)
- **Periodic submission of measured values** by e-mail
- **Periodic e-mailing of differences in measured values** (day, week, month, year)
- Periodic e-mailing of **differences** in measured values
- **DIN rail mount** with a power supply for M-BUS
- **M2M communication protocols:** SNMP, XML, Modbus/TCP
- **Support for sending alarm SMS through Poseidon SMS GW** (netGSM)
- **Response to thresholds:** SNMP trap, Email, netGSM
- **Support for programmers:** [HWg SDK](#)
- **Supported software**
  - **HWg-PD Trigger:** Control of other IP devices, alarm redirection to SMS
  - **HWg-PDMS:** Logging, export to MS Excel
  - [>> Third-party SNMP software](#)  
(HP OpenView, IBM Tivoli, Nagios, Zabbix, Monitor one, The Dude, Paessler IPCheck, Ipswitch WhatsUp, Axence nVision, CBR little:eye, LorientPro, GFI NSM, SNMPc 7, CA NSM, ActiveXperts NM, Intellipool NM, MSC Operations Manager 2007)

\* *Displayed variables depend on the actual meter*

## Description of connectors and connections



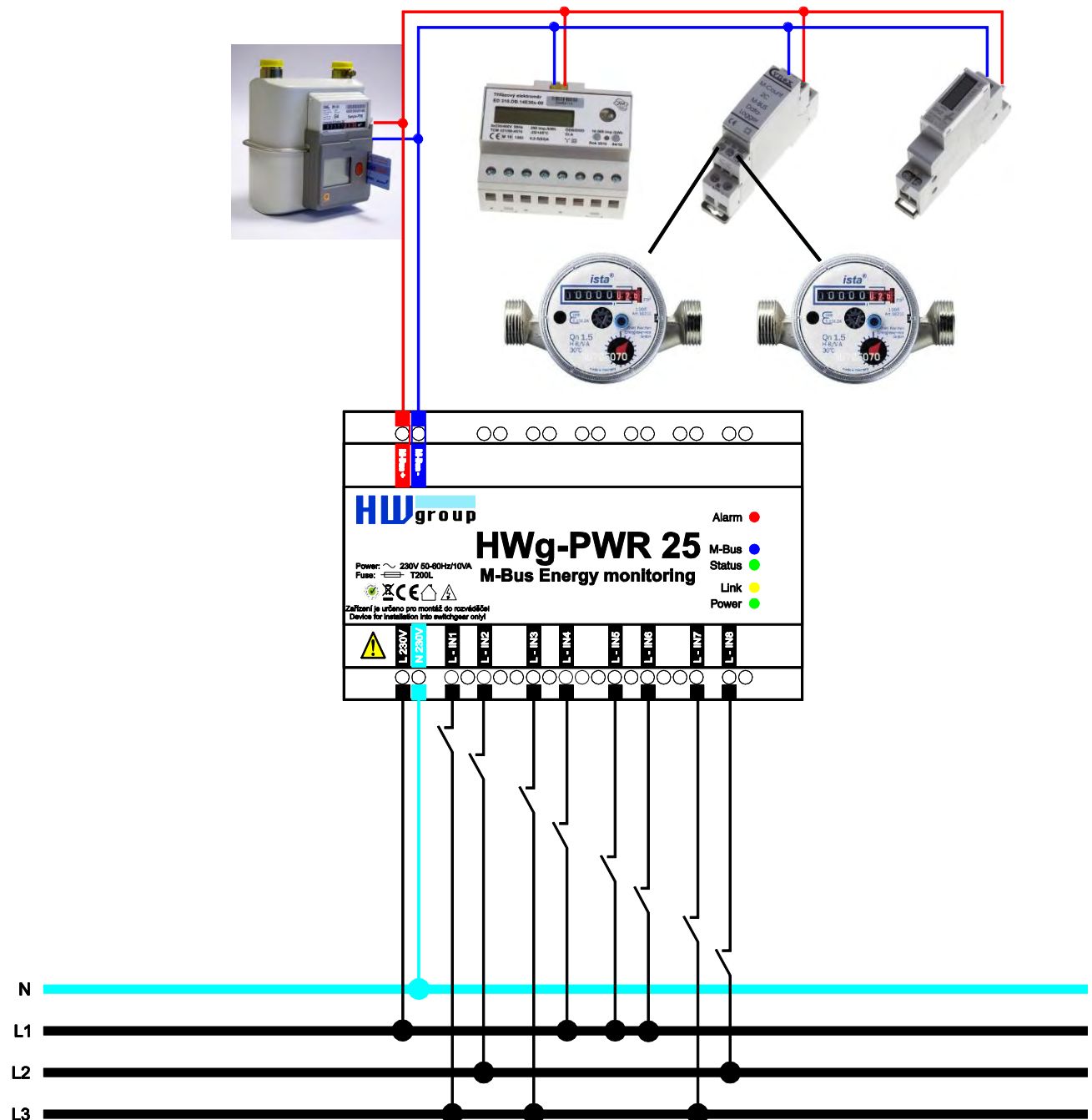
### LED indicators

- Power (green) – lights up when the device is powered.
- Alarm (red) – lights up whenever a monitored variable is in alarm.
- M-Bus (blue) – flashes whenever M-Bus communication takes place.
- Status (green) – HWg-PWR status.
  - Solid on – HWg-PWR is in regular operation.
  - Slowly flashing – HWg-PWR is starting up.
  - Rapid flashing – firmware is being uploaded.
- Link (amber) – flashes whenever communication takes place over the Ethernet interface.

## Restoring factory defaults

Press and hold the Default switch, connect power, and hold the switch pressed for 10 more seconds. HWg-PWR resets itself to factory defaults. Be careful when working with HWg-PWR in a distribution box.

## HWg-PWR wiring



## Technical specifications

Ethernet port	
+ Interface	RJ45 (10BASE-T / 100BASE-Tx)
+ Compatibility	Ethernet: Version 2.0/IEEE 802.3
+ Supported protocols	IP: ARP, TCP/IP (HTTP, SMTP, Modbus/TCP), UDP/IP (SNMP, SNMP Traps, DHCP, SNTP)
+ SNMP	Ver:1.00 compatible, partial ver. 2.0 implementation
M-Bus	
+ M-Bus meters	HWg-PWR 3 = Max 3 meters HWg-PWR 12 = Max 12 meters HWg-PWR 25 = Max 25 meters
+ M-Bus power load	Max. 25 connected meters (EN 13757-2)
Environment	
+ Operating	-5 to +50 °C (+23 to +122 °F) / 5 to 95 %RH
+ Storage	-5 to +75 °C (+23 to +167 °F) / 5 to 95 %RH
LED indicators	
+ POWER (green)	lights up when the device is powered
+ LINK (red)	flashes whenever communication takes place over the Ethernet interface
+ Status (red)	HWg-PWR status: <ul style="list-style-type: none"> <li>- Solid on – HWg-PWR is in regular operation</li> <li>- Slowly flashing – HWg-PWR is starting up</li> <li>- Rapidly flashing – firmware is being uploaded</li> </ul>
+ Alarm (red)	lights up whenever a monitored variable is in alarm
+ M-Bus (amber)	flashes whenever communication takes place over M-Bus
Buttons	
+ Default switch	When depressed at power up, resets the device to factory defaults
Digital Inputs	
+ Ports	L IN1 – L IN8
+ Type	110/230V AC voltage input for the phase failure detection
+ Impedance	120kOhm
Miscellaneous	
+ Supply voltage	110/230 V AC - 10VA; terminal block
+ Dimensions	143 x 90 x 57 [mm]
+ Fixing	DIN rail; device is intended for installation into a distribution box
+ Mass	390 g
+ Protection	200mA fuse – T200L



## First steps

### 1) Connecting the cables

**HWg-PWR connects directly to a 110/230VAC supply; therefore, it should be installed by qualified personnel only!**

- Connect the unit to the Ethernet (a patch cable to a switch, or a cross-over cable to a PC).
- Connect the M-Bus with meters. Pay attention to the polarity!
- Connect HWg-PWR to the electrical network.
- The green Power LED lights up.
- If the Ethernet connection works properly, the LINK (amber) LED lights up after a short while, and then flashes whenever data transfer takes place (activity indication).
- After power up, the amber LINK LED flashes rapidly to indicate IP address negotiation over DHCP.
- The blue M-Bus LED indicates communication over the M-Bus.

### 2) Configuring the IP address – UDP Config

**UDP Config** utility – root directory of the supplied CD (Windows and Linux versions).

Available for download at [www.HW-group.com](http://www.HW-group.com)

Software > UDP Config.

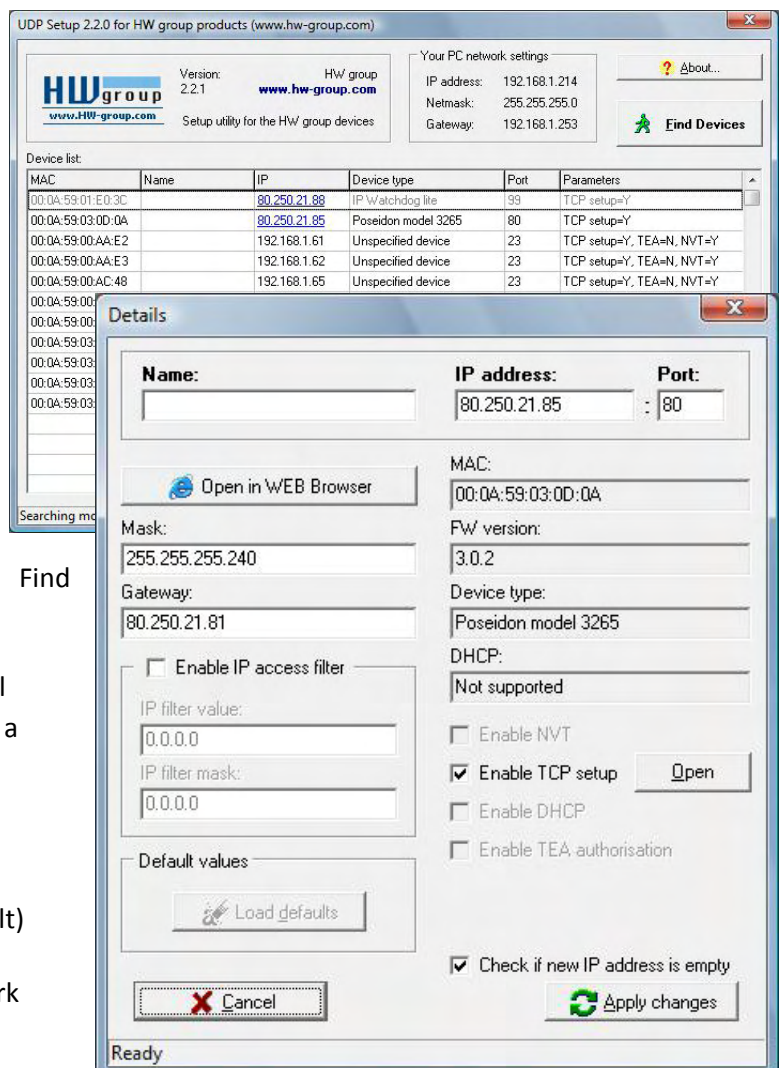
- Click the icon to launch UDP Config. The program automatically looks for connected devices.
- To search for devices, click the Find Devices icon.

The program searches for devices in your local network. Double-click a MAC address to open a basic device configuration dialog.

#### Configure the network parameters

- IP address / HTTP port (80 by default)
- Network mask
- Gateway IP address for your network
- Device name (optional)

Click the **Apply Changes** button to save the settings.



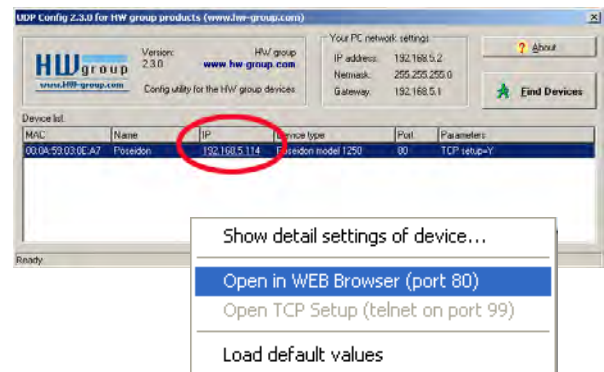
### Restoring factory defaults

- Right-click a device MAC address. Within 60 seconds after powering up the unit, factory defaults can be restored using UDP Config.
- Disconnect power, press the Default switch, power up the device and wait for 10 seconds. Release the switch. The device is ready in the factory default configuration.

### 3) WWW interface of the device

To open the WWW interface of the device:

- Enter the IP address into a web browser
- Click the IP address in UDP Config
- Click the underlined IP address in UDP SETUP

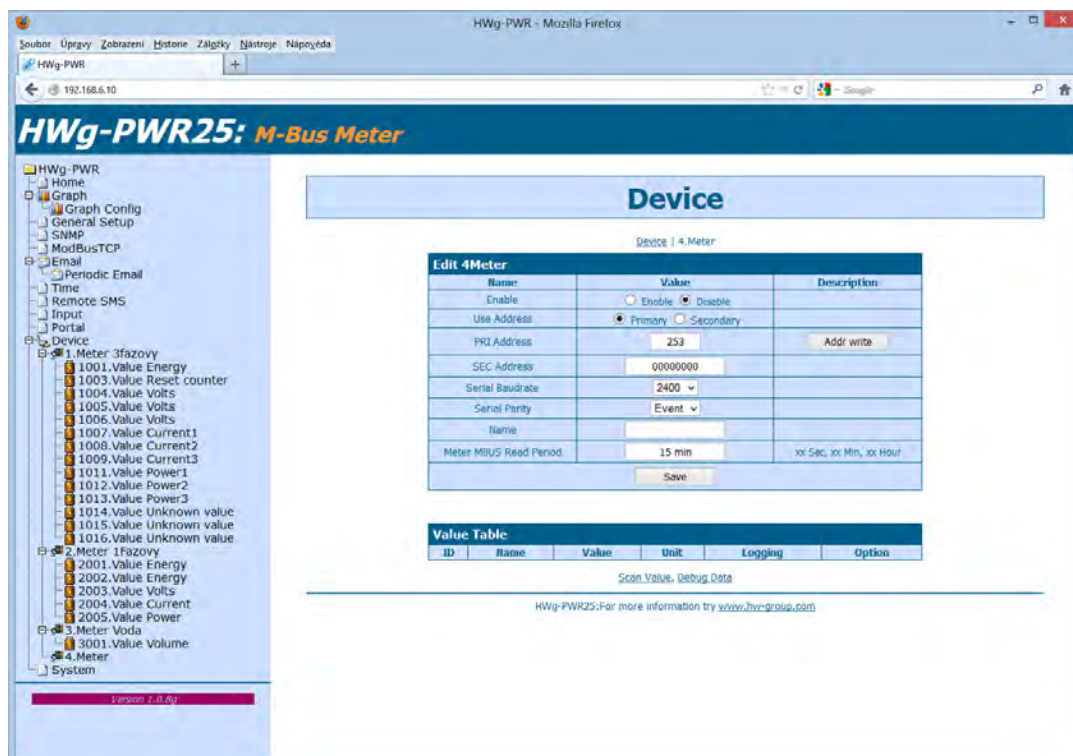


## Adding connected meters and measured values

Start the WWW interface of HWg-PWR and go to the *Device* menu. The list of detected meters **is empty**. Individual meters are always added to HWg-PWR manually. A tool for automatic discovery of meter addresses (only finds meter addresses, does not add them to the system) is also available in the *Mbus Scan* submenu:



**Note:** If you know your meter parameters, add the meters directly using Manual Add.



## Automatic discovery of meters:

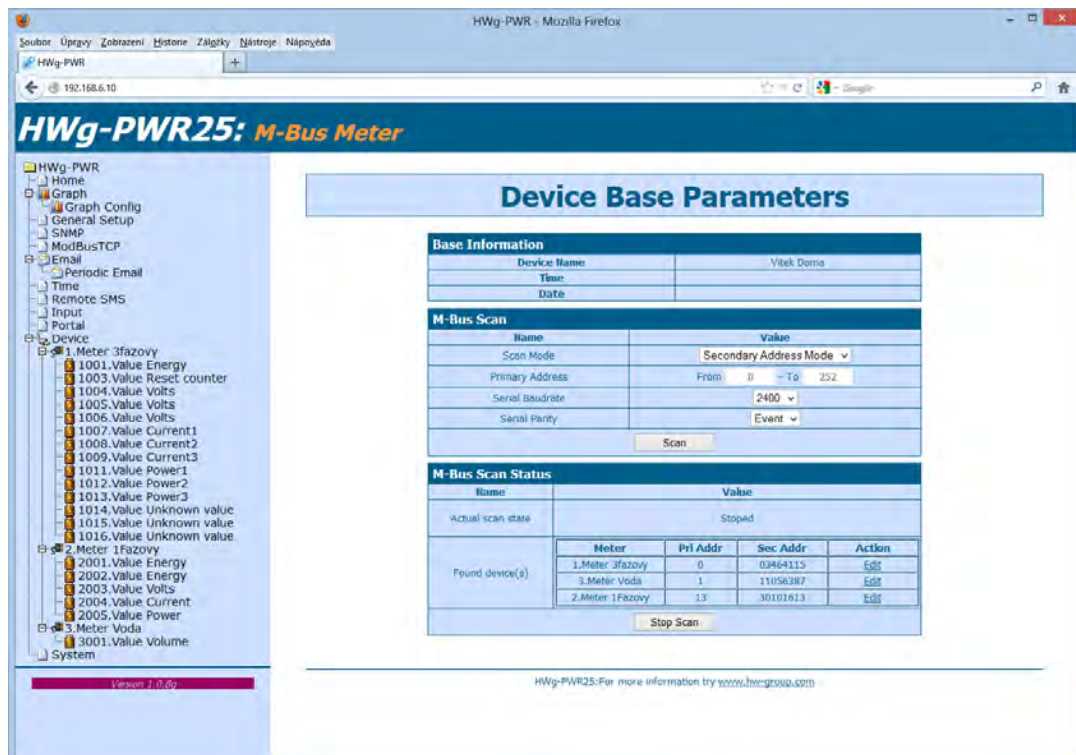
1. At the **Device Base Parameters** page, fill in the **M-Bus Scan** section:

The screenshot shows the HWg-PWR25: M-Bus Meter web interface. The left sidebar contains a tree view with categories like Home, Graph, General Setup, SNMP, ModBusTCP, Email, Time, Remote SMS, Input, Portal, and Device. The main content area is titled "Device Base Parameters" and contains three sections:

- Base Information:** A table with fields for Device Name (Vitek Doma), Time, and Date.
- M-Bus Scan:** A table with fields for Name, Scan Mode (Secondary Address Mode), Primary Address (From 0 To 252), Serial Baudrate (2400), and Serial Parity (Even). A "Scan" button is located below the table.
- M-Bus Scan Status:** A table with fields for Name, Actual scan state (Stopped), and Found device(s). Below the table is a "Stop Scan" button.

At the bottom of the page, there is a footer that reads: "HWg-PWR25: For more information try [www.hw-group.com](http://www.hw-group.com)".

- **Serial Baudrate** – Communication speed. The default is 2400 but this can differ for various meters – see the meter documentation.
  - **Serial Parity** – Communication parity. The default is Even but this can differ for various meters – see the meter documentation.
2. Click **Scan**.
  3. The **M-Bus Device Scan Status** section displays the discovery progress (*Actual scan state*) and discovered meters (*Found Device*).
  4. After the scan is complete, *Actual scan state* changes to *Stopped*.
  5. Discovered meters can be immediately activated and further configured using the *Edit* or *Add* button in the *Action* column.
  6. Repeat the action to add more meters.



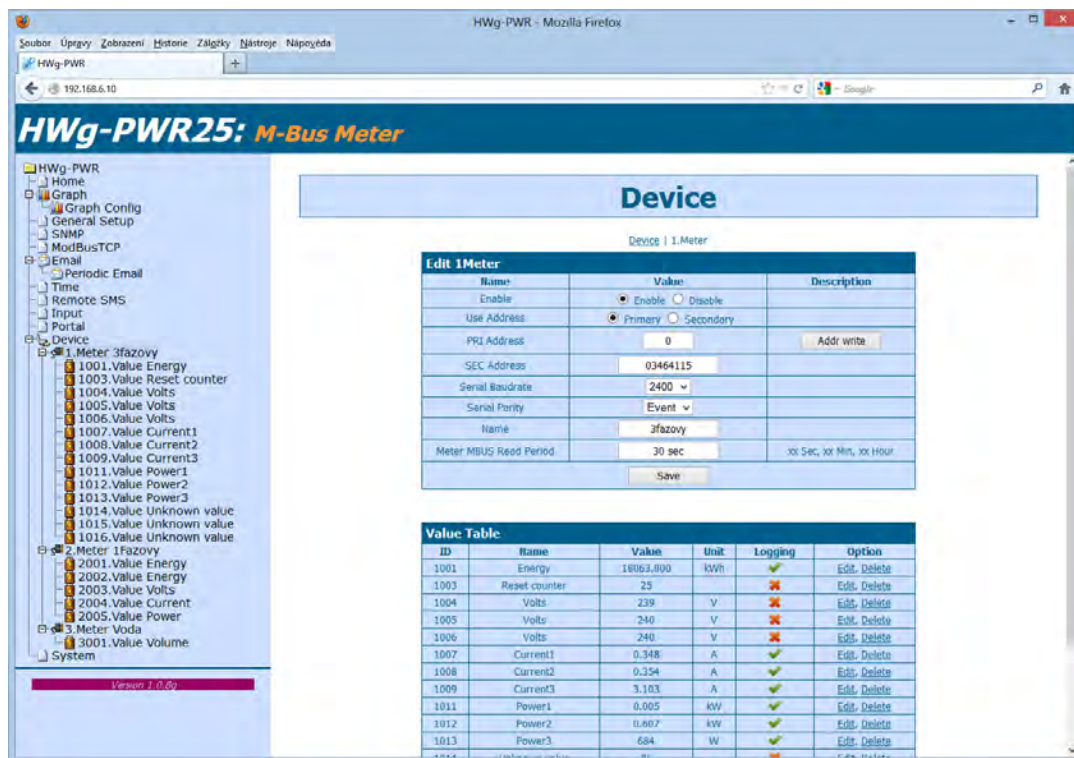
**Note:** If HWg-PWR does not find any connected meters, re-check the M-Bus connection (in particular its polarity) and the baudrate and parity configuration, or try to look up these values in the documentation of your meter. Repeat the search until you find all meters.

When only some of the meters are found but not all, the problem may be in different communication parameters. Repeat the search with other Serial Baudrate and Serial Parity settings.

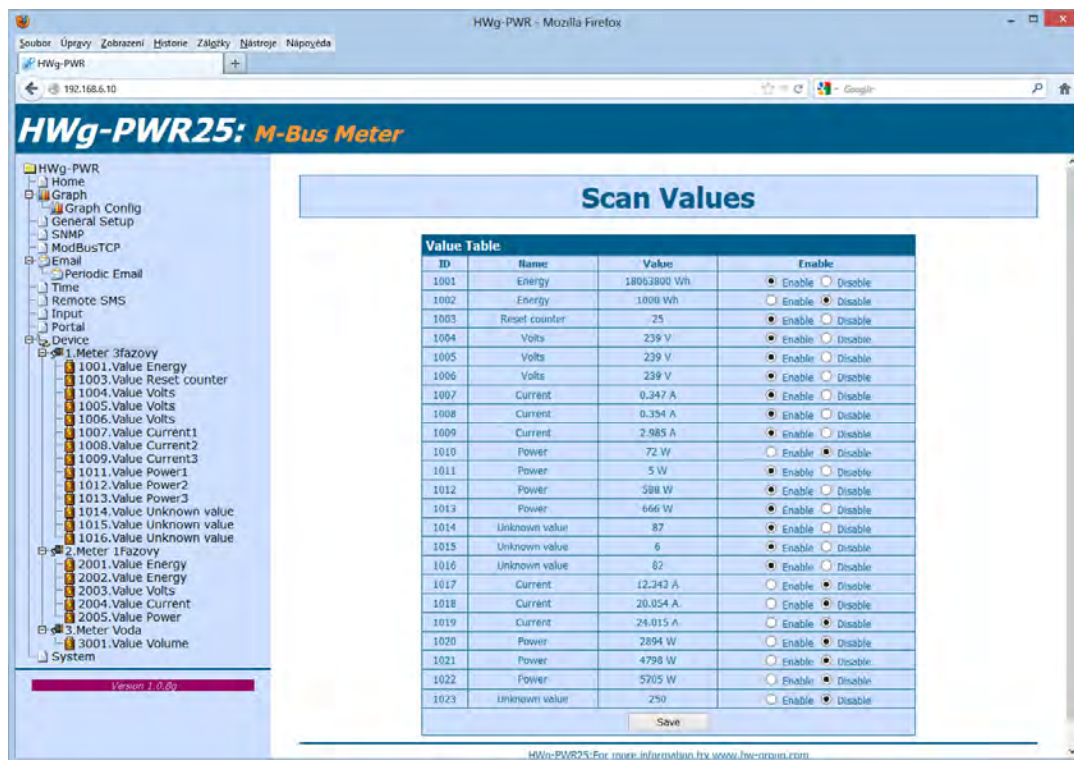


## Activating and adding discovered meters to HWg-PWR

1. In the Device menu, select the desired meter. The *Edit xMeter* section displays.



2. Turn on the meter in the system (change *Enable* to *Enable*).
3. Click *Save* to save your changes.
4. The *PRI Address*, *SEC Address*, *Medium* and *Manufacturer* fields are retrieved automatically and displayed when the page is refreshed.
5. The *Use Address* option configures the addressing mode (*Primary* – shorter primary M-Bus address; *Secondary* – unique secondary address). For battery-powered meters, we recommend to use the primary address.
6. Meters of the same type and by the same manufacturer are often supplied with the same Primary address, which therefore cannot be used for addressing. The *PRI address* field allows changing the primary address – useful for battery-powered meters.
7. The *Name* field allows assigning a custom name to the meter (Home, Office, RACK1, etc.)
8. *Meter M-Bus Read period* sets the interval for reading out the values from the meter. The default is 30s. For battery-powered meters, it might be advisable to set a longer period. For details, see *Meter types*.
9. Now select the *Scan Value* submenu of the corresponding meter (from the menu).
10. A list of values provided by the meter is displayed. Individual values can be turned on (*Enable*) and off (*Disable*):



11. Click **Save** to save your changes.

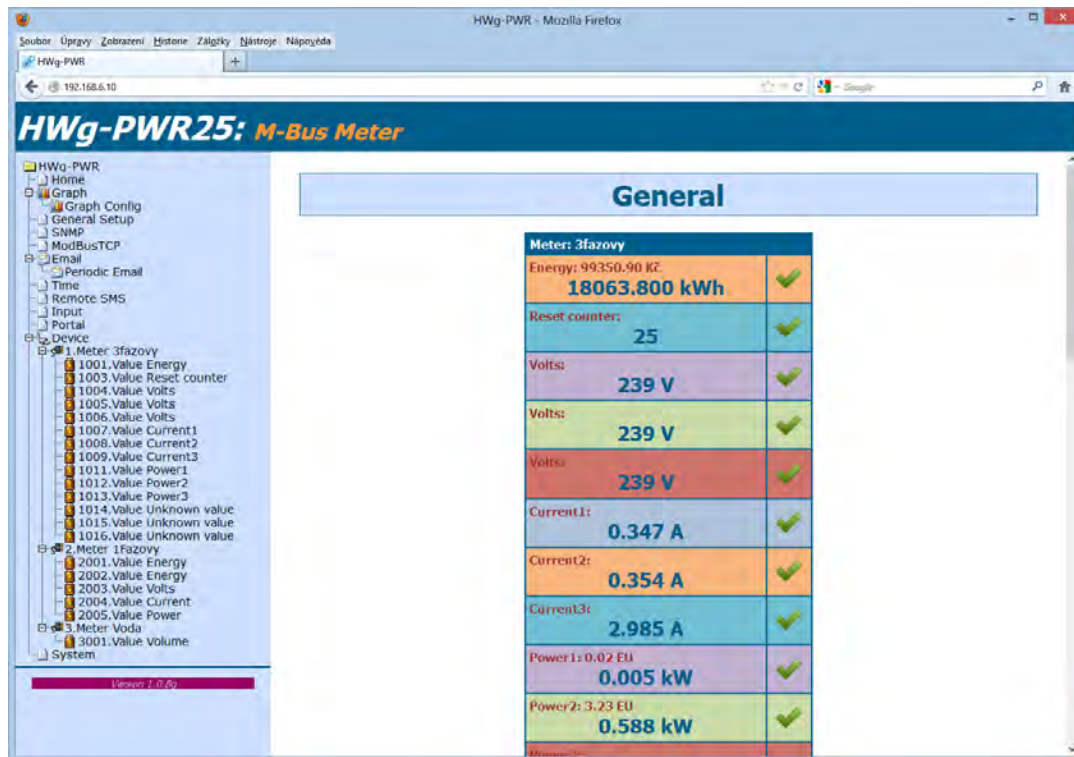
**Important:** In order to find meter variables, the meter must be enabled and saved. It is not possible to scan values without saving the meter configuration first!

Repeat steps 1 to 3 to add all required meters.

## WWW interface

### Home tab

The Home tab displays current readouts of all enabled values of a meter, together with status symbols.



The value is within its allowed range (Saferange)



The value is out of its allowed range (Saferange)



M-Bus communication error – meter stopped responding

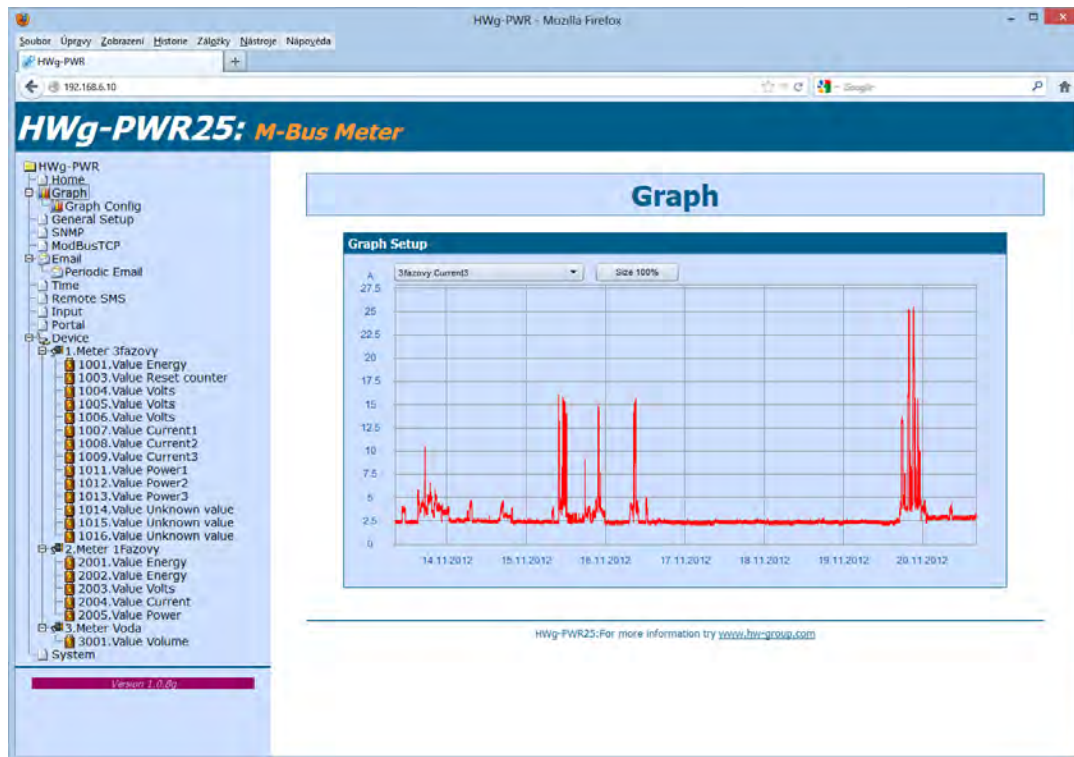


## Graph tab

The *Graph* tab lets you plot a graph of the measured values.

When this function is selected, all stored data from the device are read into the web browser. This operation can take some time.

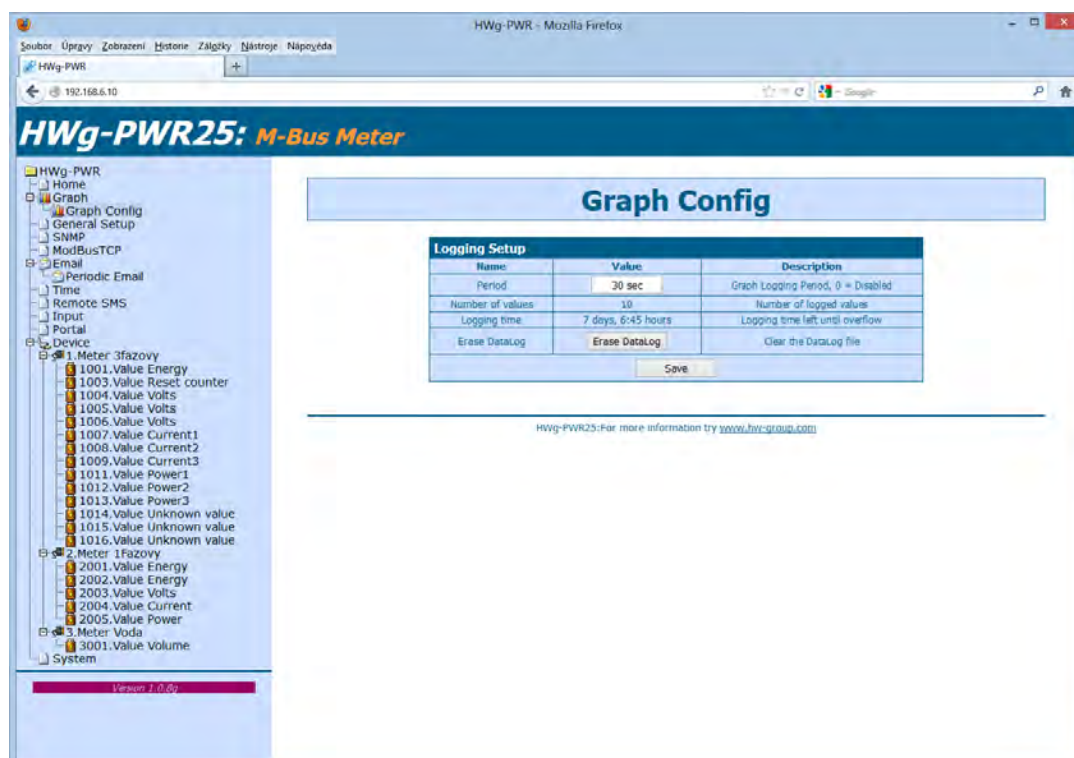
Click and drag inside the graph to see a selected portion. To restore, use the 100% button or the mouse wheel.



### Graph Config tab

Configures the logging parameters common for all measured values.

- **Period** – Period for storing to the memory. If the *Period* is shorter than the *Meter M-Bus Read period*, the most recently retrieved data are stored multiple times.
- **Number Of Values** – Number of currently logged values. The more values, the shorter log capacity.
- **Logging time** – Shows the log capacity (as time) according to current settings. Useful for log configuration or downloading.
- **Erase datalog** – Erases all measured data. All logged history is lost.



## General Setup tab

The General Setup tab is used to configure basic operating parameters of HWg-PWR.

**General Setup**

Name	Value	Description
Device Name	Vitek Doma	0 to 16 characters
WWW Info Text	HWg-PWR25: For more information try <a href="http://www.hw-group.com">www.hw-group.com</a>	
Periodic restart	Off	Periodic restart time
MBUS Debug	<input type="checkbox"/>	Enable or disable MBUS Debug in TCP port 99

Save

Name	Value	Description
DHCP	<input checked="" type="checkbox"/>	DHCP Enable/Disable
IP Address	192.168.6.10	A.B.C.D
Network Mask	255.255.255.0	A.B.C.D
Gateway	192.168.6.1	A.B.C.D
DNS Primary	192.168.1.253	A.B.C.D
DNS Secondary	10.38.0.4	A.B.C.D
HTTP Port	80	Default 80

Save

Name	Value	Description
Username		Admin username/password for device configuration changes (0 to 16 characters)
Password		

Save

HWg-PWR25: For more information try [www.hw-group.com](http://www.hw-group.com)

### Base section

- **Device Name** – Custom name for the HWg-PWR unit. Allows distinguishing individual units in a network. Maximum device name length is 16 characters.
- **WWW Info Text** – Custom text in the WWW interface footer. Useful for contact information about the operator of that particular HWg-PWR, if the device is accessible on a public IP.
- **Periodic restart** – Enables periodic restart of HWg-PWR to prevent problems in noisy Ethernet networks or to limit the consequences of hacker attacks.

### Network section

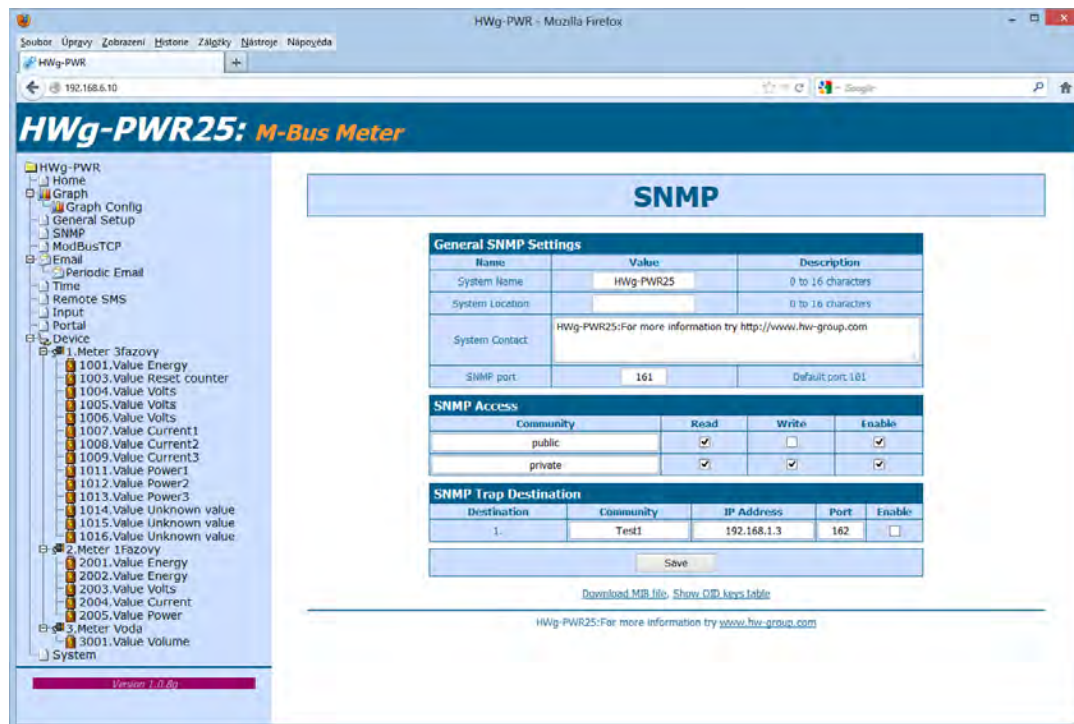
- **DHCP** – Enables IP address assignment by a DHCP server, if available. Ask your network administrator if unsure about the correct setting.
- **IP Address** – IP address of HWg-PWR. Assigned by your network administrator.
- **Network Mask** – Network mask. Assigned by your network administrator.
- **Gateway** – IP address of the default gateway. Assigned by your network administrator.
- **DNS Primary / DNS Secondary** – IP address of your DNS server. Assigned by your network administrator.
- **HTTP Port** – Port number where the built-in WWW server listens. Changing the port number is useful in situations where multiple HWg-PWR units need to be accessible from an external network through a router. Ask your network administrator if you need to change this value. The default port is 80.

### Security: Device Admin section

- **Username / Password** – User name and password for securing access to HWg-PWR.

## SNMP tab

The SNMP tab is used to configure SNMP communication parameters and target destinations for SNMP Trap alarms.



### General SNMP Settings section

- **System Name** – Name of HWg-PWR within SNMP.
- **System Location** – Location of HWg-PWR within SNMP.
- **System Contact** – Contact info of the HWg-PWR administrator within SNMP.
- **SNMP port** – Port number for SNMP communication. The default is 161.

### SNMP Access section

- **Community** – Name of the SNMP community for accessing HWg-PWR over SNMP. Two communities can be defined. Each *Community* can have the following permissions defined:
  - Read
  - Write

### SNMP Trap Destination section

- **Destination** – Index of the target destination for SNMP traps. Only A can be set, other indexes are reserved for future use.
- **Community** – Name of the Community where the SNMP trap is sent.
- **IP Address** – Target IP address for SNMP Traps.
- **Port** – Target port for SNMP Traps. Default is 162.
- **Enable** – Activation of the target destination. Useful for disabling all SNMP traps without regard to the settings for individual values.



### Show OID keys table

This function prints the entire tree of variables with their full SNMP OID and type explanation. The MIB file for connecting the HWg-PWR to third-party monitoring systems is available under the *Download MIB file* link.

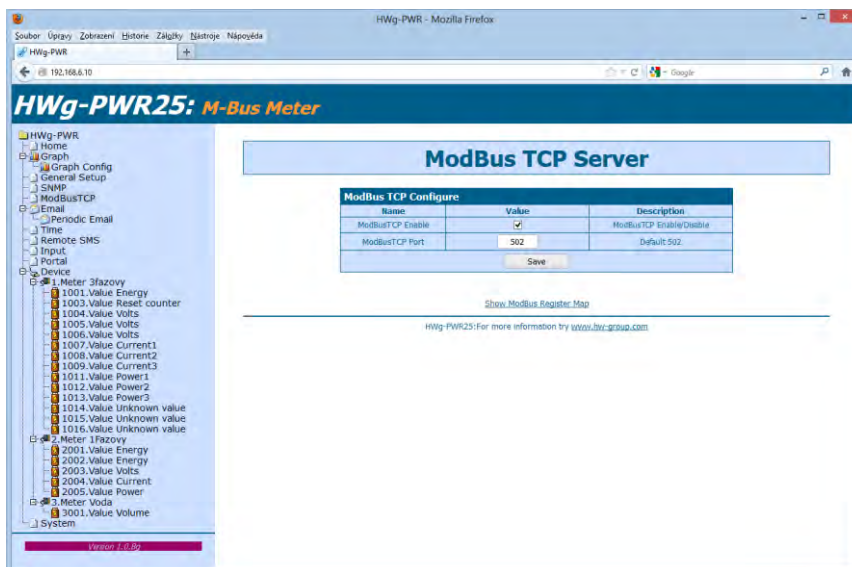
The screenshot shows the HWg-PWR25: M-Bus Meter web interface in a Mozilla Firefox browser. The left sidebar displays a tree of variables under the 'Device' section, including 'Meter 3fazovy', 'Meter 1fazovy', and 'Meter Voda'. The main content area is titled 'SNMP OID' and contains a table with the following columns: 'OID Key', 'Value', 'Description', 'Data Type', and 'Access'.

OID Key	Value	Description	Data Type	Access
1.3.6.1.2.1.1.0	HWg-PWR	System Description	string	RO
1.3.6.1.2.1.1.2.0	1.3.6.1.4.1.21796.4.6.	System ObjectID	objid	RO
1.3.6.1.2.1.1.3.0	11266700	System UpTime	timeTicks	RO
1.3.6.1.2.1.1.4.0	HWg-PWR25: For more information by <a href="http://www.hw-group.com">http://www.hw-group.com</a>	System Contact	string	RO
1.3.6.1.2.1.1.5.0	HWg-PWR25	System Name	string	RO
1.3.6.1.2.1.1.6.0		System Location	string	RO
1.3.6.1.2.1.1.7.0	72	System Services	integer	RO
1.3.6.1.4.1.21796.4.6.1.1.0	3	Meters Number	integer	RO
1.3.6.1.4.1.21796.4.6.1.2.1.1	1	1. Meter Index	integer	RO
1.3.6.1.4.1.21796.4.6.1.2.1.2	2	2. Meter Index	integer	RO
1.3.6.1.4.1.21796.4.6.1.2.1.3	3	3. Meter Index	integer	RO
1.3.6.1.4.1.21796.4.6.1.2.1.2.1	3fazovy	1. Meter Name	string	R/W
1.3.6.1.4.1.21796.4.6.1.2.1.2.2	1fazovy	2. Meter Name	string	R/W
1.3.6.1.4.1.21796.4.6.1.2.1.2.3	Voda	3. Meter Name	string	R/W
1.3.6.1.4.1.21796.4.6.1.2.1.3.1	0	1. Meter Address	integer	RO
1.3.6.1.4.1.21796.4.6.1.2.1.3.2	13	2. Meter Address	integer	RO
1.3.6.1.4.1.21796.4.6.1.2.1.3.3	1	3. Meter Address	integer	RO
1.3.6.1.4.1.21796.4.6.1.2.1.4.1	3464115	1. Meter Sec Address	integer	RO
1.3.6.1.4.1.21796.4.6.1.2.1.4.2	30101613	2. Meter Sec Address	integer	RO
1.3.6.1.4.1.21796.4.6.1.2.1.4.3	11056387	3. Meter Sec Address	integer	RO
1.3.6.1.4.1.21796.4.6.1.2.1.5.1	14	1. Meter Values number	integer	RO
1.3.6.1.4.1.21796.4.6.1.2.1.5.2	5	2. Meter Values number	integer	RO
1.3.6.1.4.1.21796.4.6.1.2.1.5.3	1	3. Meter Values number	integer	RO
1.3.6.1.4.1.21796.4.6.1.3.1.1.1.1001	1001	1001. Value Valid	integer	RO
1.3.6.1.4.1.21796.4.6.1.3.1.1.1.1003	1003	1003. Value Valid	integer	RO
1.3.6.1.4.1.21796.4.6.1.3.1.1.1.1004	1004	1004. Value Valid	integer	RO
1.3.6.1.4.1.21796.4.6.1.3.1.1.1.1005	1005	1005. Value Valid	integer	RO
1.3.6.1.4.1.21796.4.6.1.3.1.1.1.1006	1006	1006. Value Valid	integer	RO
1.3.6.1.4.1.21796.4.6.1.3.1.1.1.1007	1007	1007. Value Valid	integer	RO
1.3.6.1.4.1.21796.4.6.1.3.1.1.1.1008	1008	1008. Value Valid	integer	RO
1.3.6.1.4.1.21796.4.6.1.3.1.1.1.1009	1009	1009. Value Valid	integer	RO
1.3.6.1.4.1.21796.4.6.1.3.1.1.1.1011	1011	1011. Value Valid	integer	RO
1.3.6.1.4.1.21796.4.6.1.3.1.1.1.1012	1012	1012. Value Valid	integer	RO
1.3.6.1.4.1.21796.4.6.1.3.1.1.1.1013	1013	1013. Value Valid	integer	RO
1.3.6.1.4.1.21796.4.6.1.3.1.1.1.1014	1014	1014. Value Valid	integer	RO
1.3.6.1.4.1.21796.4.6.1.3.1.1.1.1015	1015	1015. Value Valid	integer	RO
1.3.6.1.4.1.21796.4.6.1.3.1.1.1.1016	1016	1016. Value Valid	integer	RO
1.3.6.1.4.1.21796.4.6.1.3.1.2.2.2001	2001	2001. Value Valid	integer	RO
1.3.6.1.4.1.21796.4.6.1.3.1.2.2.2002	2002	2002. Value Valid	integer	RO
1.3.6.1.4.1.21796.4.6.1.3.1.2.2.2003	2003	2003. Value Valid	integer	RO
1.3.6.1.4.1.21796.4.6.1.3.1.2.2.2004	2004	2004. Value Valid	integer	RO

## Modbus TCP Server

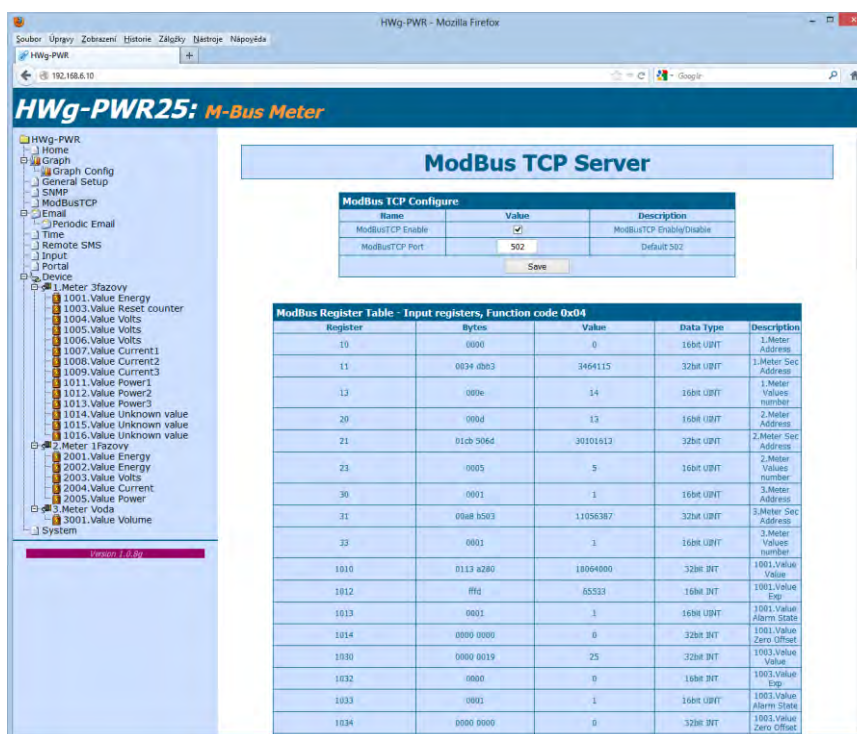
HWg-PWR can supply data to SCADA systems using the ModBus/TCP protocol.

- *ModbusTCP Enable* – Enables the ModBus/TCP protocol.
- *ModbusTCP Port* – Port for the Modbus/TCP protocol (default is 502).



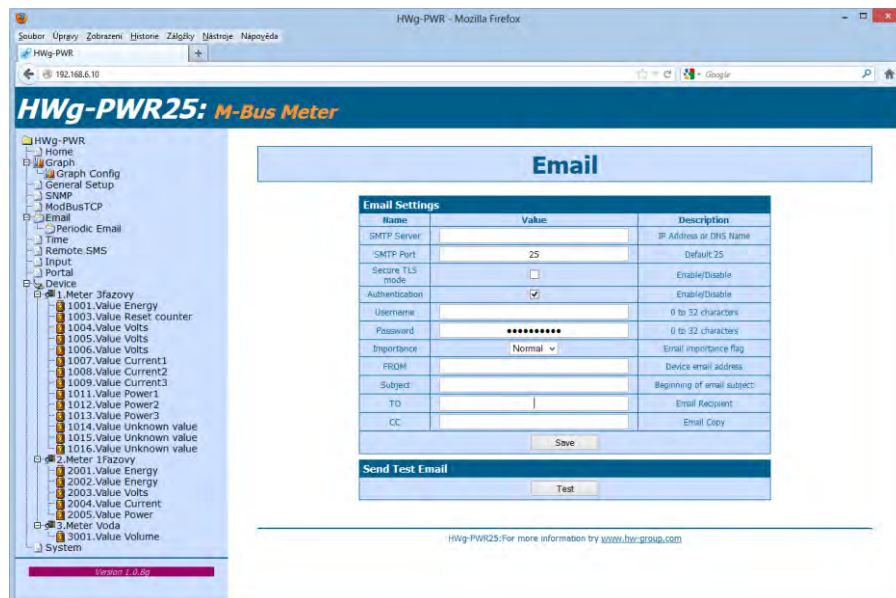
### Show Modbus Register Map

This function prints the entire tree of variables with all individual ModBus registers and data types.



## E-mail tab

The *E-mail* tab is used to define the e-mail server and the parameters for sending alarm e-mails (beginning or end of an alarm). HWg-PWR only supports unencrypted SMTP connections.



### Email Settings section

- **SMTP Server** – IP address or domain name of your SMTP server.
- **SMTP port** – Port number where the SMTP server listens. The default is 25.
- **Authentication** – Enables authentication. Check this box if your SMTP server requires authentication.
- **Username** – Username for authentication to the SMTP server. If the Authentication box is not checked, this field is irrelevant.
- **Password** – Password for authentication to the SMTP server. If the Authentication box is not checked, this field is irrelevant.
- **Importance** – Sets the e-mail message priority. This is important for filtering and further processing of alarm messages.
- **FROM** – E-mail address of the sender, that is, the HWg-PWR unit. The address may be necessary for the SMTP server and can be used to identify the HWg-PWR unit, or for filtering and further processing of alarm messages.
- **Subject** – E-mail subject. Contents of this field can be used to identify the HWg-PWR unit, or for filtering and further processing of alarm messages.
- **TO** – E-mail address of the recipient of alarm messages. Only one e-mail address can be entered.
- **CC** – E-mail address of the recipient of a copy of the alarm message. Only one e-mail address can be entered.

The *To* and *CC* fields cannot accept distribution lists or multiple e-mail addresses. If you need to send alarm messages to more recipients, ask your SMTP server administrator to create a distribution list accessible through a single e-mail address.

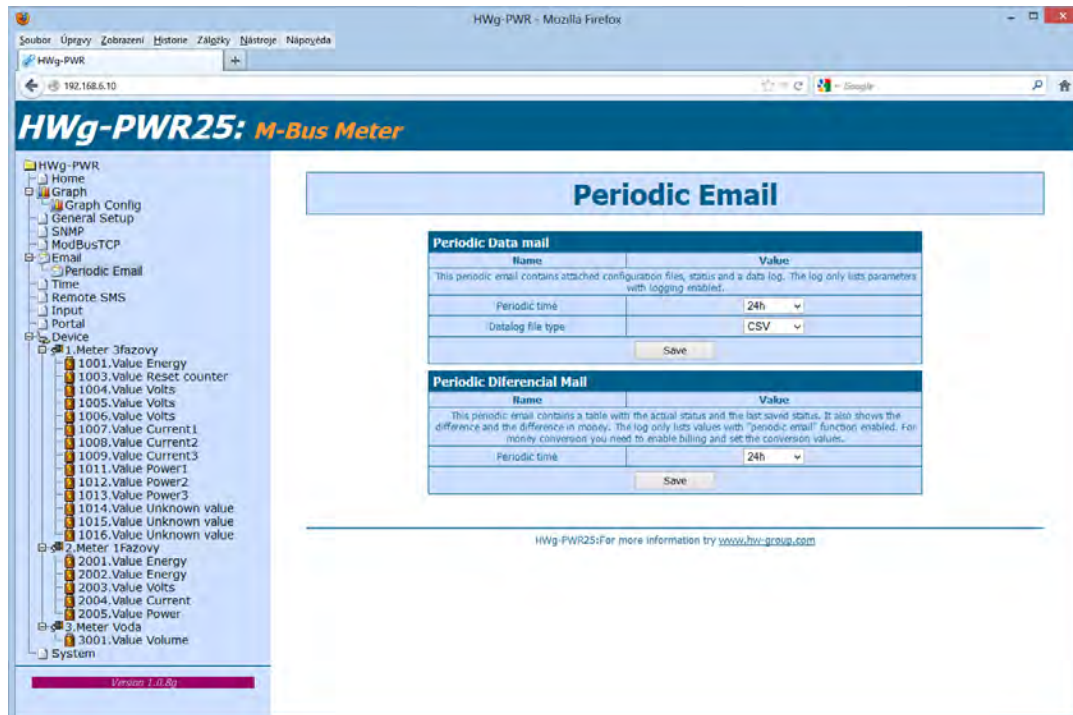
### Send Test Email section

After configuring *Email Settings*, use this button to send a test e-mail.

## Periodic Email

Configures the period for sending non-alarm messages.

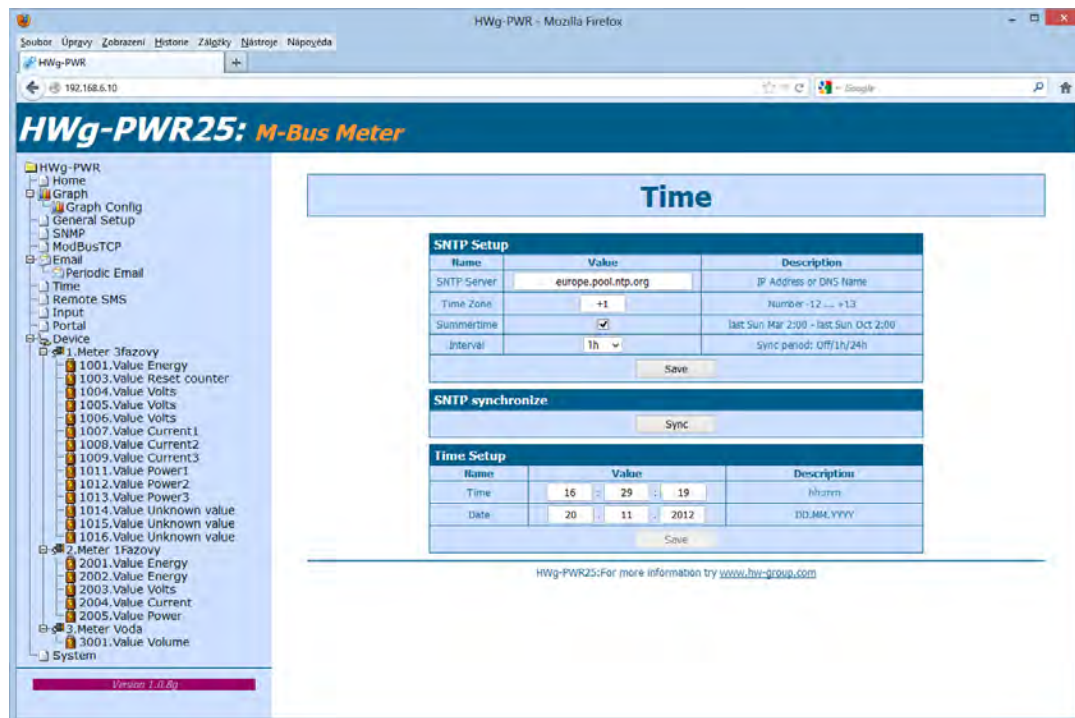
- **Periodic Data mail** – Periodically e-mails the log of measured values. The log only contains values which have logging enabled!
  - **Datalog file type** – Select datalogs type – CSV or BIN (Binary – see chapter Datalog format )
- **Periodic Diferencial Mail** – Periodically e-mails the differences of the measured values for the given interval, that is, daily, weekly or monthly consumption. Warning – only values with enabled periodic e-mailing are sent.





## Time tab

The *Time* tab is used to configure system time and automatic synchronization with a timeserver.



### SNTP Setup section

- **SNTP Server** – IP address or host name of the time synchronization server. Default is *time.nist.gov*.
- **Time Zone** – Timezone where HWg-PWR is located. Used to set correct system time. Necessary for correct logging of measured values.
- **Summertime** – Enables daylight savings time. Used to set correct system time. Necessary for correct logging of measured values.
- **Interval** – The period for synchronizing time with the server.

### SNTP Synchronize section

The *Sync* button immediately synchronizes time with the time server. Can be used to test the settings.

### Time Setup section

The *Time Setup* section lets you enter current date and time manually, when synchronization with a time server is unavailable.

## Remote SMS tab

This tab is used to setup the alarm SMS parameters. The SMS messages are sent through a remote SMS gateway with the netGSM protocol support.

**HWg-PWR25: M-Bus Meter**

**Remote SMS**

Name	Value	Description
Remote SMS Gateway	Disable	Target device with GSM modem for sending SMS
IP Address		A.B.C.D
Port	80	Default 80
Target Number		Target Phone Number
Username		Remote Device Username
Password		Remote Device Password
SMS Normal Text	%DEV_NAME% Normal: %SRC_NAME% = %SRC_VALUE% %	%DEV_NAME% = Device Name %SRC_NAME% = Meter Name %SRC_VALUE% = Meter Value
SMS Alarm Text	%DEV_NAME% Alarm: %SRC_NAME% = %SRC_VALUE% %	%SRC_UNIT% = Meter Unit

Save

**Send Remote SMS testing messages**

Test Normal Test Alarm

HWg-PWR25: For more information try [www.hw-group.com](http://www.hw-group.com)

## Remote SMS setup section

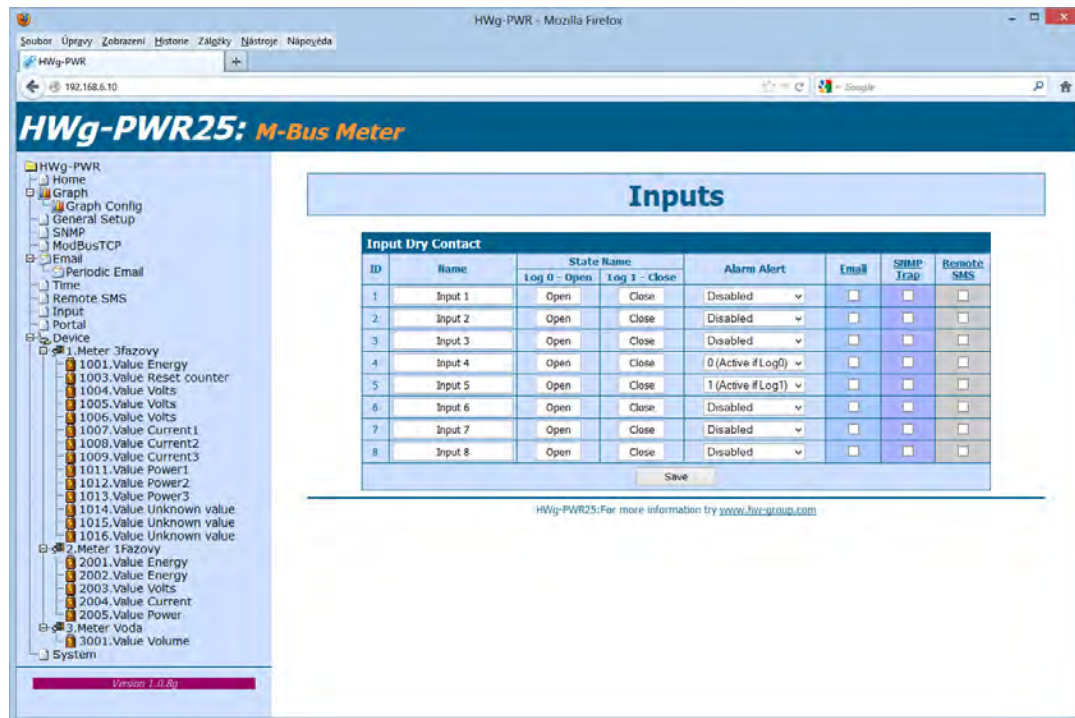
- **Remote SMS Gateway** – Enables / disables this function
- **IP Address** – Remote gateway IP address
- **Port** – TCP port that the gateway listens to
- **Target number** – SMS phone number
- **Username** – Username for the remote gateway, can be skipped
- **Password** – Password for the remote gateway, can be skipped
- **SMS Normal Text** – Macro to create the SMS that announces an end of alarm
- **SMS Alarm text** – Macro to create the SMS that announces an alarm

## Send Remote SMS testing messages section

- **Test Normal** – Sends a test SMS announcing the end of alarm
- **Test Alarm** – Sends a test SMS announcing an alarm

## Input tab

This tab is used to configure the parameters of dry contact inputs.



## Input Dry Contacts section

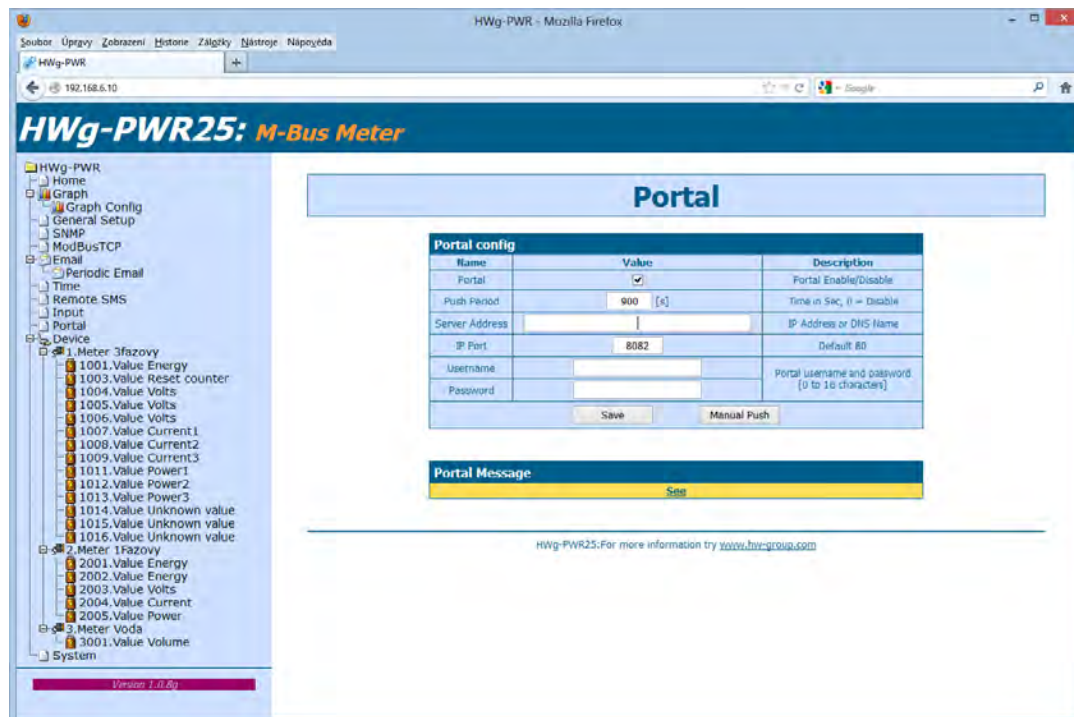
For each input, you can define:

- **Name** – Name of the input, shown at the homepage and in alarm messages.
- **State Name** – Name of the respective dry contact state at the homepage and in alarm messages.
  - **Log. 0 – Open** – Name of the logic low (contact open, idle) state.
  - **Log. 1 – Close** – Name of the logic high (contact closed) state.
- **Alarm Alert** – Defines the alarm state.
  - **Disabled** – Alarm function is disabled.
  - **0 (Active if Log.0)** – Alarm when the contact is open.
  - **1 (Active if Log.1)** – Alarm when the contact is closed.
- **E-mail** – Determines if an e-mail is sent when the Alarm state is activated or deactivated for the respective input.
- **SNMP Trap** – Determines if a SNMP Trap is sent when the Alarm state is activated or deactivated for the respective input.

## Portal

This tab is used to setup parameters to send the data to a remote portal using HWg-PUSH. You can find out more about the protocol and portal solution support here:

<http://www.hw-group.com>



### Portal Config section

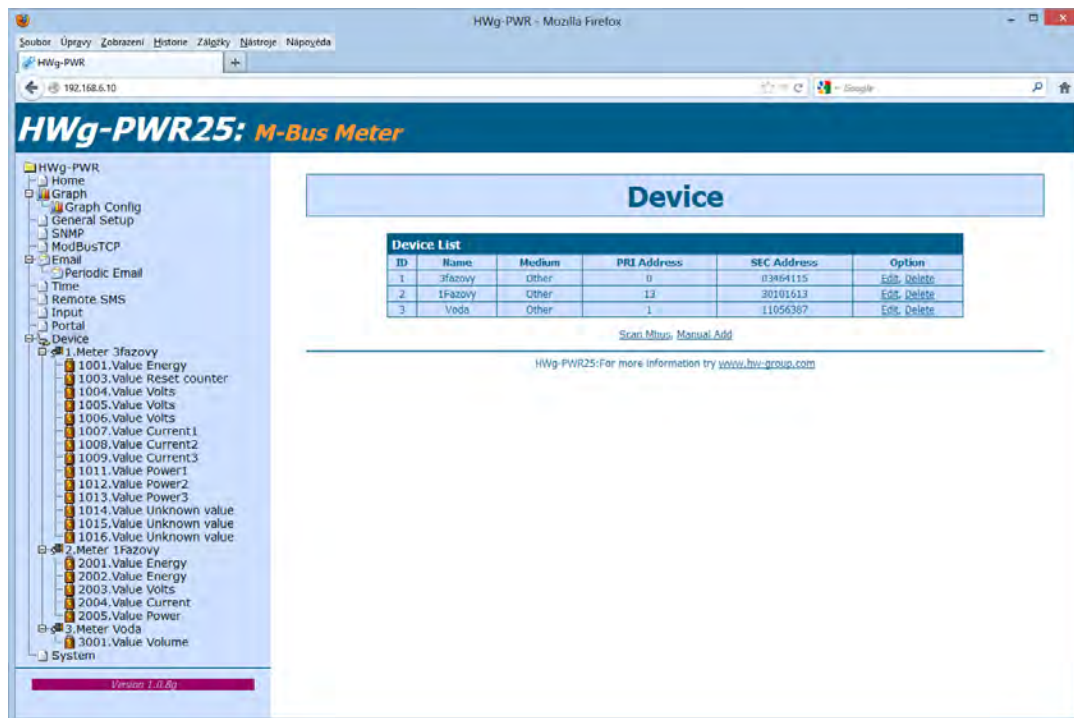
- **Portal** – Enables / disables this function
- **Push Period** – Period in which the data is pushed to the remote server. This is received from the portal.
- **Server address** – Complete URL of the remote server
- **IP Port** – Port that the portal listens to
- **Username** – Username to assign the HWg-PWR to a user. You will get this from the portal administrator.
- **Password** – Password to assign the HWg-PWR to a user. You will get this from the portal administrator.

### Portal Message section

Information from the portal such as links to graphs etc... This depends on the type of portal you are using.

## Device tab

This tab is used to discover connected meters (Device), set their parameters, and to subsequently find and configure the values provided by individual meters.

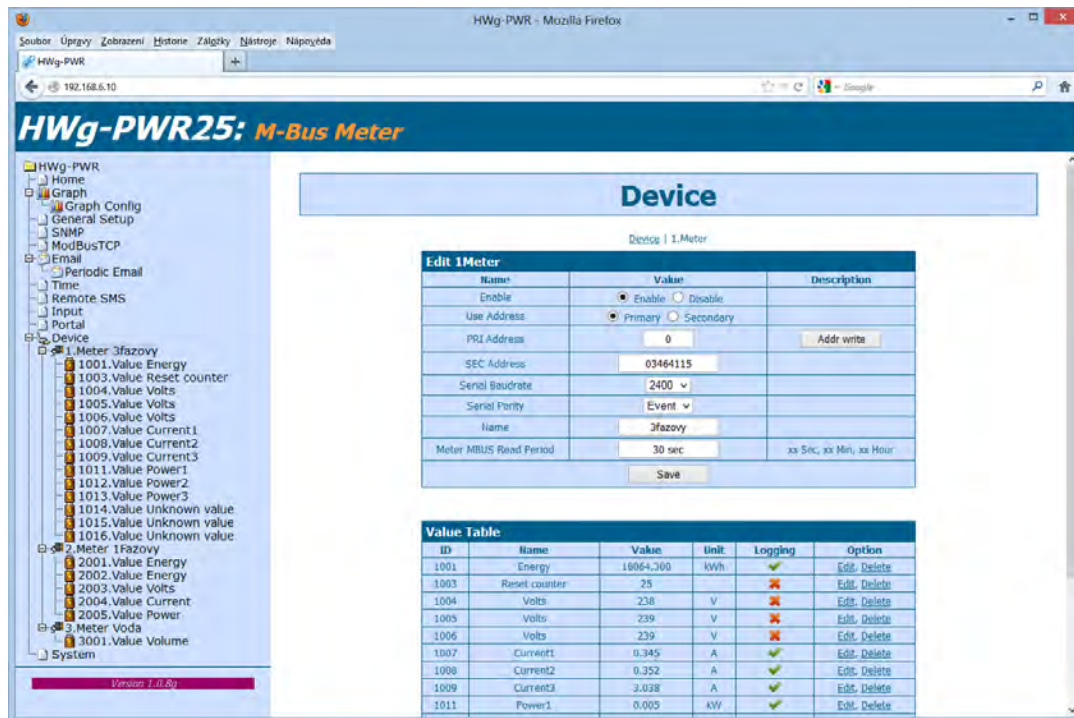


## Device List section

The Device List section lists all connected meters together with their type (*Medium*) and M-Bus address (*Address*). To edit a meter, click "Edit" on the corresponding line. Each meter is assigned a unique *ID* within HWg-PWR for use in XML and SNMP communication.



## Edit xMeter section



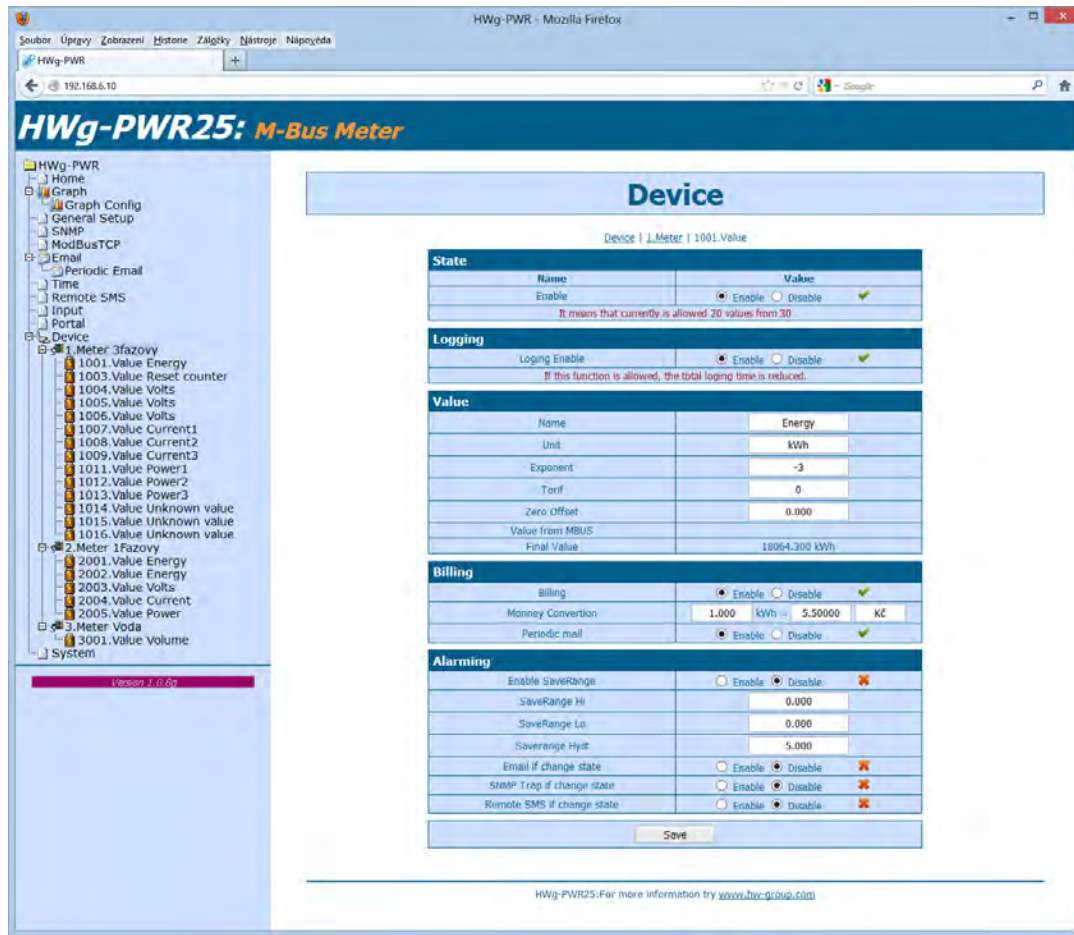
- **Enable** – Enables or disables the meter within HWg-PWR. When a meter is disabled, values are not detected or read but the configured parameters remain stored. This can be used to temporarily turn off the reading and recording for a particular meter (during maintenance etc.)
- The **Use Address** option configures the addressing mode (*Primary* – shorter primary M-Bus address; *Secondary* – unique secondary address). For battery-powered meters, we recommend to use the primary address.
- **PRI Address** – Primary address on the M-Bus. The address is entered as one byte (0-255). Meters of the same type and by the same manufacturer are often supplied with the same Primary address, which therefore cannot be used for addressing. The field allows changing the primary address as a convenience for battery-powered meters.
- **Secondary Address** – Secondary address on the M-Bus. This address is used to identify a meter if there are more meters with the same primary address (*Address* field) on the bus. Secondary address is not user-changeable.
- **Serial Baudrate** – M-Bus communication speed for the particular meter. By default, 2400 Baud is configured. Meters with different communication speeds can coexist on a single bus; this parameter sets the speed for the particular meter.
- **Serial Parity** – M-Bus communication parity. As with the baudrate, parity can be specified individually for each meter.
- **Meter M-Bus Read period** sets the interval for reading out the values from the meter. The default is 30s. For battery-powered meters, it might be advisable to set a longer period. For details, see *Meter types*.
- **Name** – Meter name. Identifies the meter within HWg-PWR – in graphs, XML and SNMP – using a custom name (Home, Office, RACK1, etc.).

- *Scan Value* – Reads the values and their parameters from the meter. See *First Steps*.

### *Value Table section*

The *Value Table* section displays information about discovered values from a particular meter – their names (*Name*), units of measurement (*Unit*), current readings (*Value*), and whether logging is enabled. Each value is assigned a unique ID within HWG-PWR for use in XML and SNMP communication. To edit a variable, its parameters and properties, click “*Edit*” on the corresponding line.

## Edit y.Value on x.Meter tab



### State section

- **State** – Turns on/off the respective variable.

### Logging section

- **Logging** - Enables logging of values into the internal memory, at intervals specified at the Log tab. When logging is enabled for fewer variables, more records can be stored.

### Value section

- **Name** – Value name. Identifies the value (variable).
- **Unit** – Physical unit of measurement. Identifies the unit of the value being measured. Together with its exponent, it can be used to convert the value to a custom format and unit (W/kW, kWh/MWh, dm<sup>3</sup>/l and so on).
- **Exponent** – Allows you to change the order of the displayed unit of measurement.
- **Tariff** – Identifies the tariff in multi-tariff meters.
- **Zero Offset** – Bias. Allows a modification of the displayed value by adding (subtracting) a fixed number. Typically used to monitor differences for a given time period.
- **Value From MBUS** – RAW data received over M-BUS.
- **Final Value** – Resulting value after processing the received data, exponent and unit of measurement.



### *Billing section*

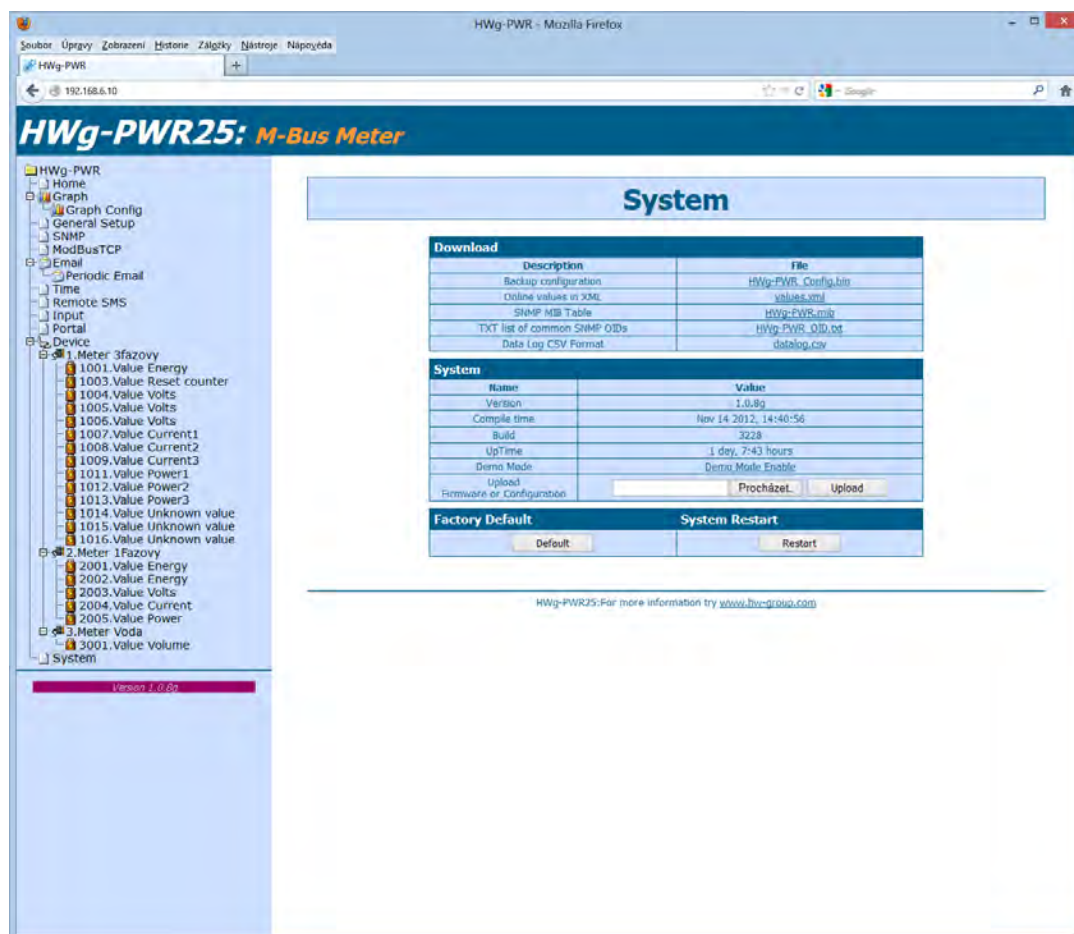
- *Billing* – Enables conversion of the measured value to currency (creating a virtual value tied to the actual value). Further on, this variable will be reported in terms of the measured quantity as well as its monetary equivalent. This conversion will be included in alarm and periodic messages as well as in XML files and the device homepage.
- *Money Conversion* – Sets the conversion factor and currency for conversion of values to money.
- *Periodic Diferencial Mail* – Enables inclusion of the value to the periodic e-mail with differences.

### *Alarming section*

- *Enable SaveRange* – Enables the monitoring function for the current value and its allowed range. This can be used to monitor if a value (line current, flow rate, etc.) exceeds the allowed range, and alert to excessive (or suspiciously low) energy consumption in order to avoid more serious problems.
- *SafeRange Hi* – Upper limit. Alarm occurs if the measured value exceeds the value specified here.
- *SafeRange Lo* – Lower limit. Alarm occurs if the measured value falls below the value specified here.
- *Saferange Hyst* – Allowed hysteresis. Suppresses false alarms if the measured value oscillates near the threshold. The hysteresis only applies in the direction into the *SafeRange*. That is, alarm always starts when *SafeRange Hi* or *SafeRange Lo* is crossed but only ends when the threshold plus (or minus) *Saferange Hyst* is reached.
- *E-Mail if Change State* – Specifies whether an e-mail should be sent whenever an Alarm begins or ends.
- *SNMP Trap if change state* – Specifies whether a SNMP Trap should be send whenever an Alarm begins or ends.

## System tab

The *System* tab is used to access the most important system information, such as uptime or firmware version, and to perform operations such as HWg-PWR restart or firmware update.



## Download section

- *Backup configuration* – Click to save the current HWg-PWR configuration. Saved configuration can be later restored. ([http://hwg-pwr.hwg.cz/HWg-PWR\\_Config.bin](http://hwg-pwr.hwg.cz/HWg-PWR_Config.bin))
- *Online values in XML* – Address of a XML file with current readouts. Intended for automated processing at remote servers. (<http://hwg-pwr.hwg.cz/values.xml>)
- *SNMP MIB Table* – Address of the MIB file that contains the definitions of SNMP variables. (<http://hwg-pwr.hwg.cz/HWg-PWR.mib>)
- *TXT list of common SNMP OIDs* – Overview of the most important OIDs from the MIB table. ([http://hwg-pwr.hwg.cz/HWg-PWR\\_OID.txt](http://hwg-pwr.hwg.cz/HWg-PWR_OID.txt))
- *Data Log CSV Format* – Address of a CSV file with a logged history of readouts. Intended for automated processing at remote servers. (<http://hwg-pwr.hwg.cz/log.csv>)

## Factory Default section

Restores factory default settings. The default IP address is 192.168.1.99 and no user name or password is defined.

## Meter types

With respect to the mode of operation, meters can be classified as:

- Mains-powered (electricity meters)
- Battery-powered (heat meters, water meters, gas meters etc.)

Manufacturers of battery-powered meters may restrict the number of read operations within a certain time interval in order to maintain battery life. Typically, one can encounter meters that allow, for instance, only up to 15 reads/day, 2 reads/hour, etc. These limits differ by meter type and by manufacturer, and should be specified in the meter documentation.

With the default reading period in HWg-PWR (30s), it is easy to exceed these limits. Then, the meter stops responding in order to maintain its declared battery life. Exceeding these limits cannot be considered a defect of HWg-PWR.

## Internal memory size

HWg-PWR equipped with 2MB internal memory for storing measured values. The available recording time depends on the number of values being stored. One value occupies 12 bytes of memory.

Therefore,  $2048\text{kB} \cdot 1024 = 2,097,152\text{B} / 12\text{B} =$  approximately 170,000 records (due to the internal memory organization, the actual number is slightly smaller).

### *Examples:*

*8 values*

*Recorded once in 5 minutes*

$170,000 / 8 = 21,250$  records = 1770 hours = 73 days

*5 values*

*Recorded once per 60 s*

$170,000 / 5 = 34,000$  records = 566 hours = 23 days

*25 values*

*Recorded once per 60 min.*

$170,000 / 25 = 6,800$  records = 283 days

## Datalog format of devices HWg-PWR and HWg-Ares

The data is stored in a simple binary format:

<record1>< record2>< record3><record4><record5>...<recordN>

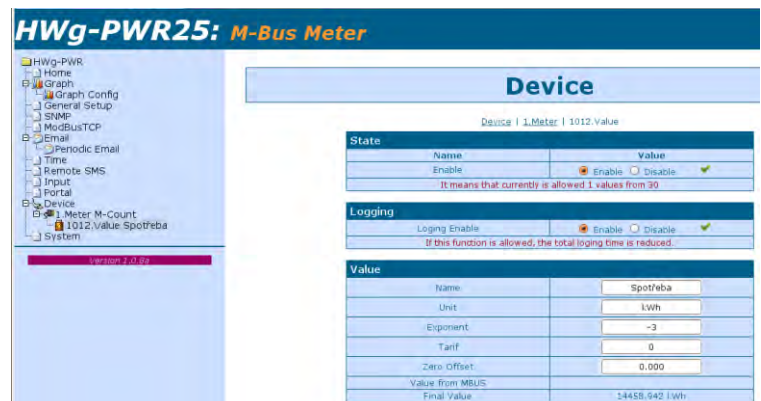
The record format is following:

- Sensor ID (2 bytes)
- TimeStamp (4 bytes)
- Value (4 bytes)

The TimeStamp is stored in Unix time format (time\_t). More information about the format you can find for example here

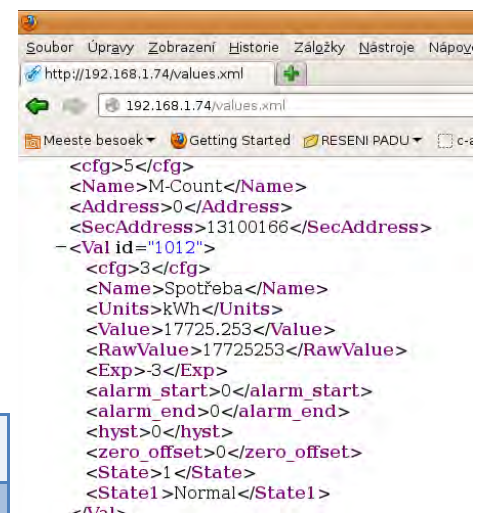
[http://en.wikipedia.org/wiki/Unix\\_time](http://en.wikipedia.org/wiki/Unix_time). The

Value is stored without decimal point. An exponent tells you where you have to move decimal point to get real value (mathematical expression:  $\text{right\_value} = \text{value} * 10^{\text{EXP}}$ ). On screen shot you can see an example of sensor with ID = 1012 and exponent -3.



The exponent you can get from values.xml too. On following screen shot there is the same information about the the same sensor you can see in values.xml file.

But there is a few little differences between these devices. Some of them store data in little endian format and others in big endian. More information about endianness you can see for example here <http://en.wikipedia.org/wiki/Endianness>. And some of them store timestamp in local and others in universal time.



	Endiannes	TimeStamp
HWg-PWR	big	devices's local time
HWg-PWR 25	little	devices's local time
HWg-Ares	little	universal time (UTC)

```

/* hwg pwr datalog.c
 *
 * Default is datalog written on standard output.
 * Command "hwg pwr datalog.exe > out.txt" writes the records into file.
 */

#include <stdio.h>
#include <time.h>
#include <winsock.h>

/* For device HWg-PWR 25 and HWg-Ares uncomment next line */
/* #define ARES */

#ifdef ARES
#define _HTONS_(VAL) ( VAL )
#define _HTONL_(VAL) ( VAL )
#else
#define HTONS(VAL) ( htons(VAL) )
#define _HTONL_(VAL) ( htonl(VAL) )
#endif

```

```
/* Special pragma for Borland C++ Builder - other compilers probably use a different
way
 * how to say to compiler an information about structures packing
 */
#pragma pack(push)
#pragma pack(1)
typedef struct {
    unsigned    int16 val id; /* Value ID */
    unsigned    int32 time; /* Unix time format time t */
    int32 value; /* Value = value * 10^EXP, where EXP is exponent */
} HWG_PWR_LOG_ENTRY;
#pragma pack(pop)

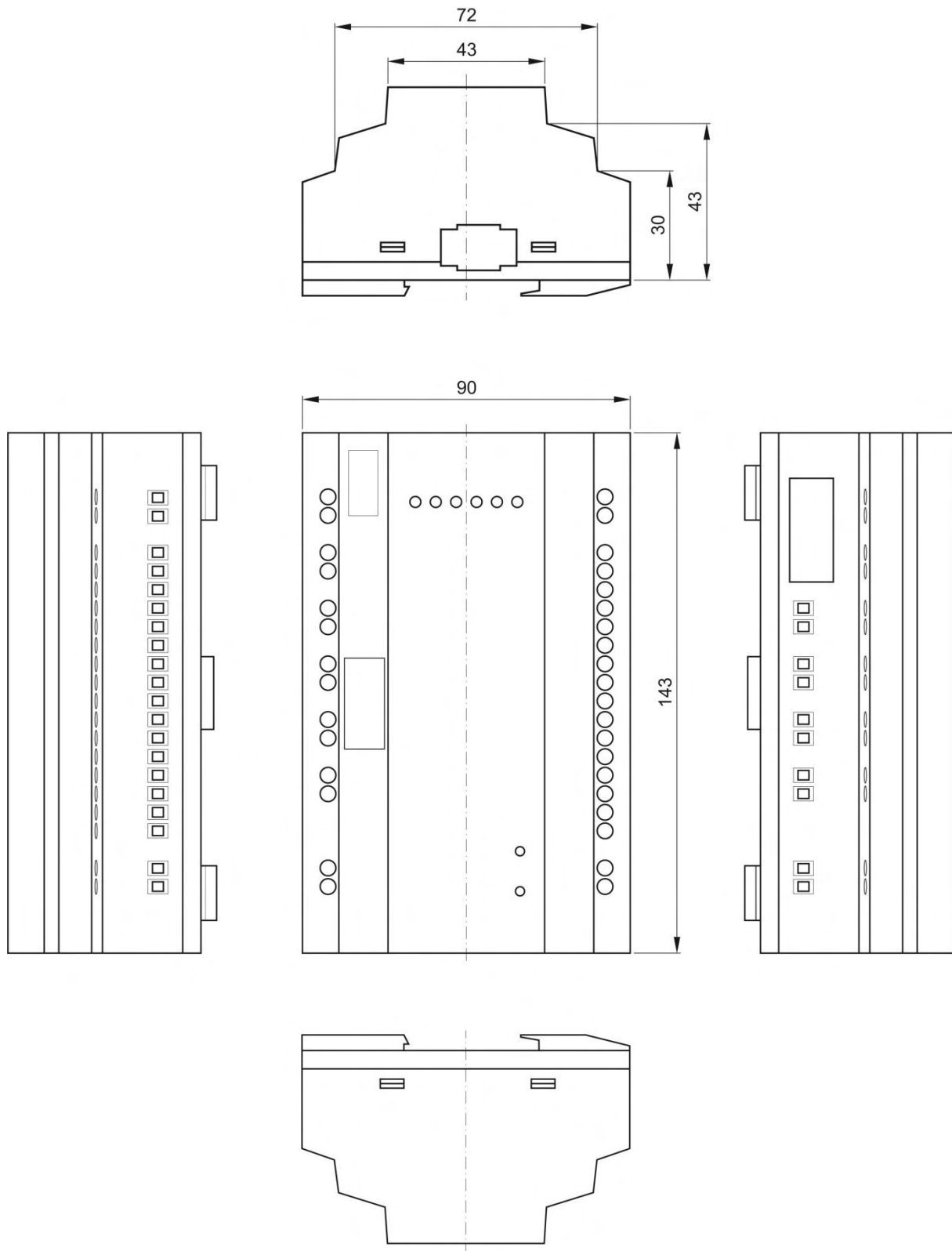
int main(int argc, char* argv[])
{
    FILE *InFile;
    HWG_PWR_LOG_ENTRY Entry;
    time_t t;

    InFile = fopen("datalog.bin", "rb");
    if (!InFile) {
        fprintf(stderr, "File 'datalog.bin' could not open!");
        return 1;
    }

    printf("-----\n");
    printf(" ID      | VALUE      | TIME\n");
    printf("-----\n");
    while (fread(&Entry, sizeof(HWG_PWR_LOG_ENTRY), 1, InFile)) {
        t = _HTONL_(Entry.time);
        printf(" %5d | %10d | %s",
            HTONS (Entry.val id),
            _HTONL_(Entry.value),
            asctime(gmtime(&t))
        );
    }
    printf("-----\n");
    printf(" ID      | VALUE      | TIME\n");
    printf("-----\n");

    fclose(InFile);

    return 0;
}
```

**Mechanical**



## Accessories

<b>DHZ 5/63-M-BUS</b>	Single-phase 63A electricity meter with M-Bus
<b>ED 310.DB HWG</b>	Three-phase, two-tariff, 63A electricity meter with M-Bus and S0
<b>M-Count 2C</b>	Converter and datalogger, 2x pulse output (S0) / M-Bus



DHZ 5/63-M-BUS



ED 310.DB HWG



M-Count 2C



## Manufacturer

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<http://www.HW-group.com>

