http://www.hms-networks.com/about/labs/smart-grid/labline-sg/sg-10

LABLINE SG gateway manual

History

Revision	Date	Description	Responsible
1.0	October 24th, 2014	WEB-PLC manual	David Garcés

Contents

1 Introduction 5

2 LABLINE SG family 6

2.1 Programming the WEB-PLC 6

2.1.1 System requirements 6

2.1.2 Cable the device 6

2.1.3 Configure the network settings 6

2.1.4 Access the embedded webserver 8

2.1.5 Create your application 8

2.1.6 Run your application 11

2.1.7 Configure the device settings 11

2.1.7.1 Network settings 12

2.1.7.2 DHCP 13

2.1.7.3 Login 14

2.1.7.4 Firewall 14

2.1.7.5 NAT 15

2.1.7.6 openVPN 16

2.1.7.7 Cellular modem settings 18

2.1.7.8 SMS messaging 19

2.1.8 Protocol settings 20

2.1.8.1 Modbus 20

2.1.8.2 M-Bus 21

2.1.8.3 IEC60870-5-104 22

2.2 Programming on C/C++ 23

3 SG10 24

3.1 General Data 24

3.2 Electrical Data 24

3.3 Power Supply 24

3.4 Digital I/Os 24

3.5 Serial Interface 24

3.6 Ethernet Interface 25

3.7 LEDs 25

3.8 Other Interfaces 25

3.9 SD card 25

3.10 SIM card 26

3.11 Reset button 26

3.12 Commissioning 26

4 SG11 27

4.1 General Data 27

4.2 Electrical Data 27

4.3 Power Supply 27

4.4 Digital I/Os 27

4.5 Serial Interface 28

4.6 Ethernet Interface 28

4.7 LEDs 28

4.8 Other Interfaces 28

4.9 SD card 28

4.10 SIM card 29

4.11 Reset button 29

4.12 Commissioning 29

4.13 M-Bus compatible devices.....30

1 Introduction

This document describes the LABLINE SG gateway family. The target audience for this document are users that work with the devices during commissioning, configuration, programming and operation phases.

The LABLINE SG gateway family currently consists on two devices, the SG-10 and the SG-11 gateways. Both of them share many features, next chapter describes the common functionality, e.g. programming the WEB-PLC.

Chapter 3 describes the LABLINE SG-10 gateway's hardware features.

Chapter 4 describes the LABLINE SG-11 gateway's hardware features.

2 LABLINE SG family

2.1 Programming the WEB-PLC

WEB-PLC is a simple PLC (Programmable Logic Controller) software with a web-browser-based programming interface. WEB-PLC's graphical editor lets you edit function diagrams similar to the well known CFCs (Continuous Function Charts).

2.1.1 System requirements

The following features are needed on your local computer:

- Ethernet network interface
- Microsoft Windows XP/Vista/7
- Internet connection
- Web-browser:
  - Mozilla Firefox (recommended)
  - Microsoft Internet Explorer 8 or later (version 9 or later recommended)
  - Google Chrome
  - Apple Safari
  - Opera
- Chiptool (can be downloaded at http://www.hms-networks.com/labs/smart-grid/labline-sg)

The WEB-PLC software should run on any up-to-date web-browser on any PC operating system. However to determine/configure your device's IP address, the IP-Tool is needed, which only runs on Windows.

2.1.2 Cable the device

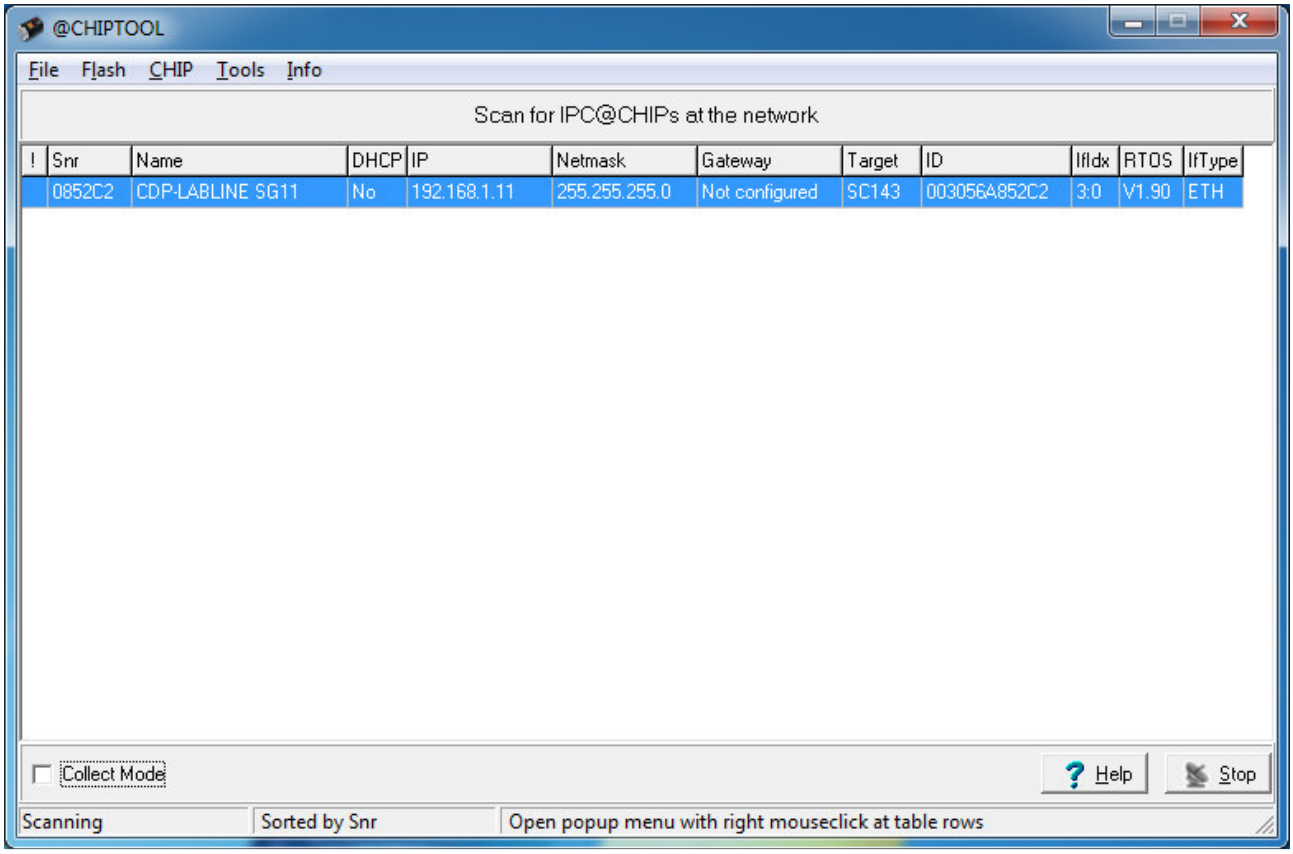
Use an Ethernet cable to connect the SG device to your PC. If you have an existing network infrastructure, use a patch cable to connect the SG device to your hub or switch. If not, use a crossover cable to directly connect the SG's Ethernet jack to your PC's Ethernet jack. Now connect the power supply unit to the SG's power supply jack to power the device.

2.1.3 Configure the network settings

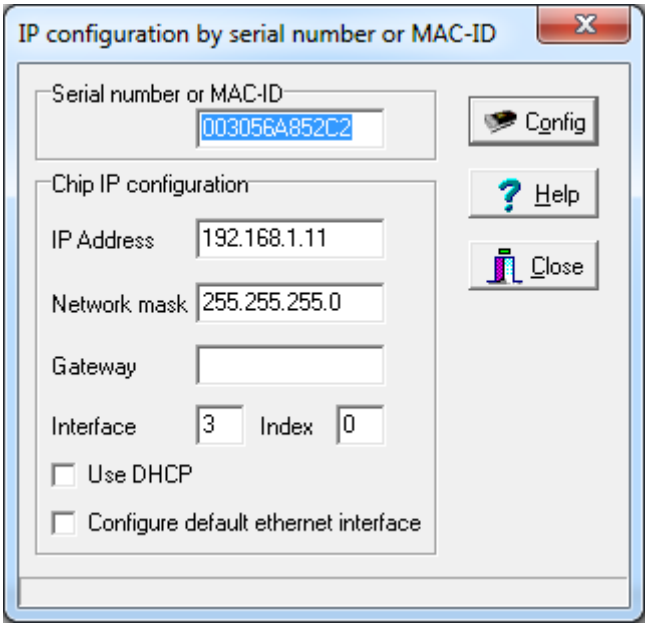
To be able to access the embedded website, the device must have a valid IP address and we have to know it. Therefore we will use the IP-Tool.

When you start the IP-Tool it will scan for SG devices on the local network. The MAC IDs of the devices will be displayed in a list. Select the MAC ID of your device from the list. The MAC ID can be found on the label on the device's housing.

You'll now be shown the current IP configuration of the device. By default the device will try to get an IP address from a DHCP server at start. If this does not work, an auto IP will be activated. Check if the current settings match the needs of your network. If you are in doubt, ask you network administrator.

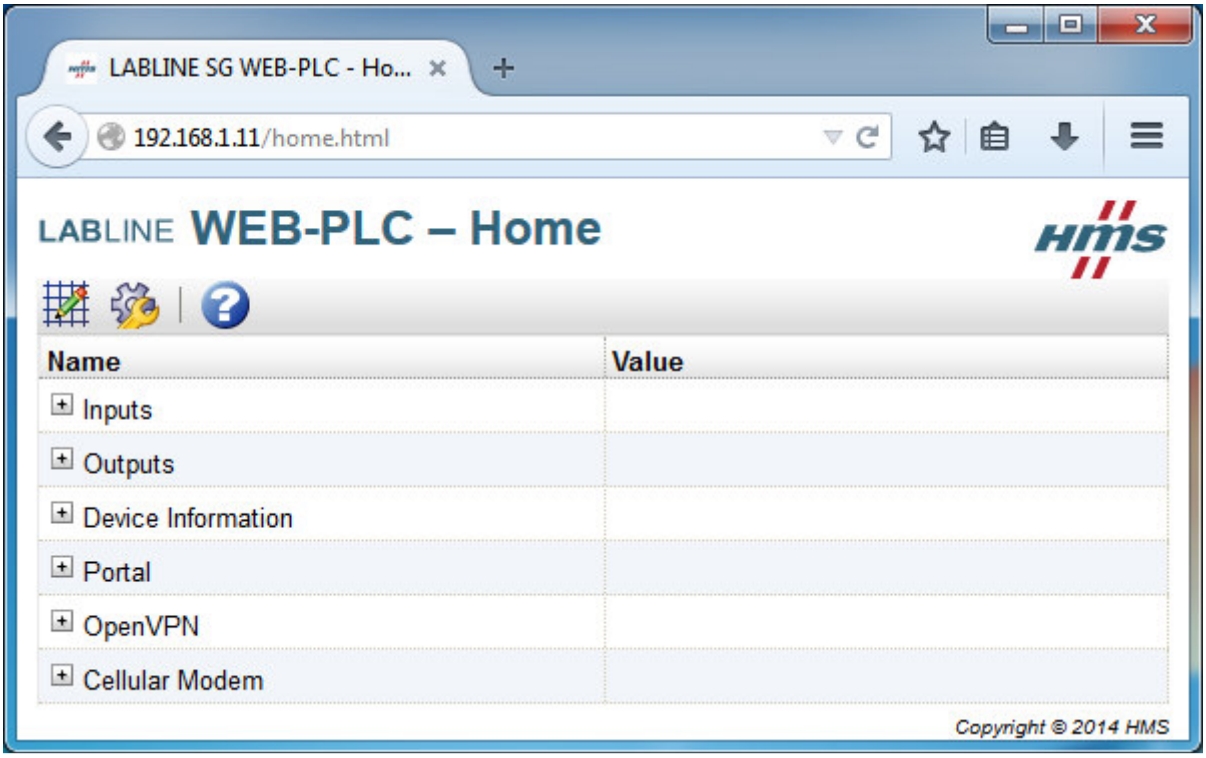


If the configuration does not match, you may change it. Change the addresses as required and finally click the Config button. The IP-Tool will ask for a password. **By default this password is *hms***. If you're running a firewall, make sure that it does not block any network functions of the IP-Tool.

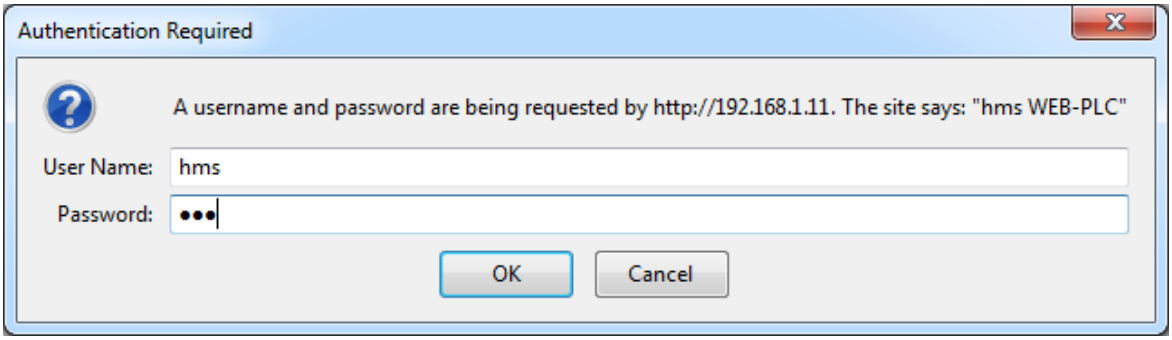


2.1.4 Access the embedded webserver

Now enter the device's IP address into your webbrowser. An intro page will be shown shortly and then you will be forwarded to the WEB-PLC's home page. The home page provides an overview of the device's status. Besides the current values of the I/Os it shows information on the device hardware and software and on special components such as the cellular modem or OpenVPN.



Use the *Editor* icon to go to the WEB-PLC editor.



The website will request a username and password. **Both are *hms* by default**. Now the WEB-PLC editor page will appear.

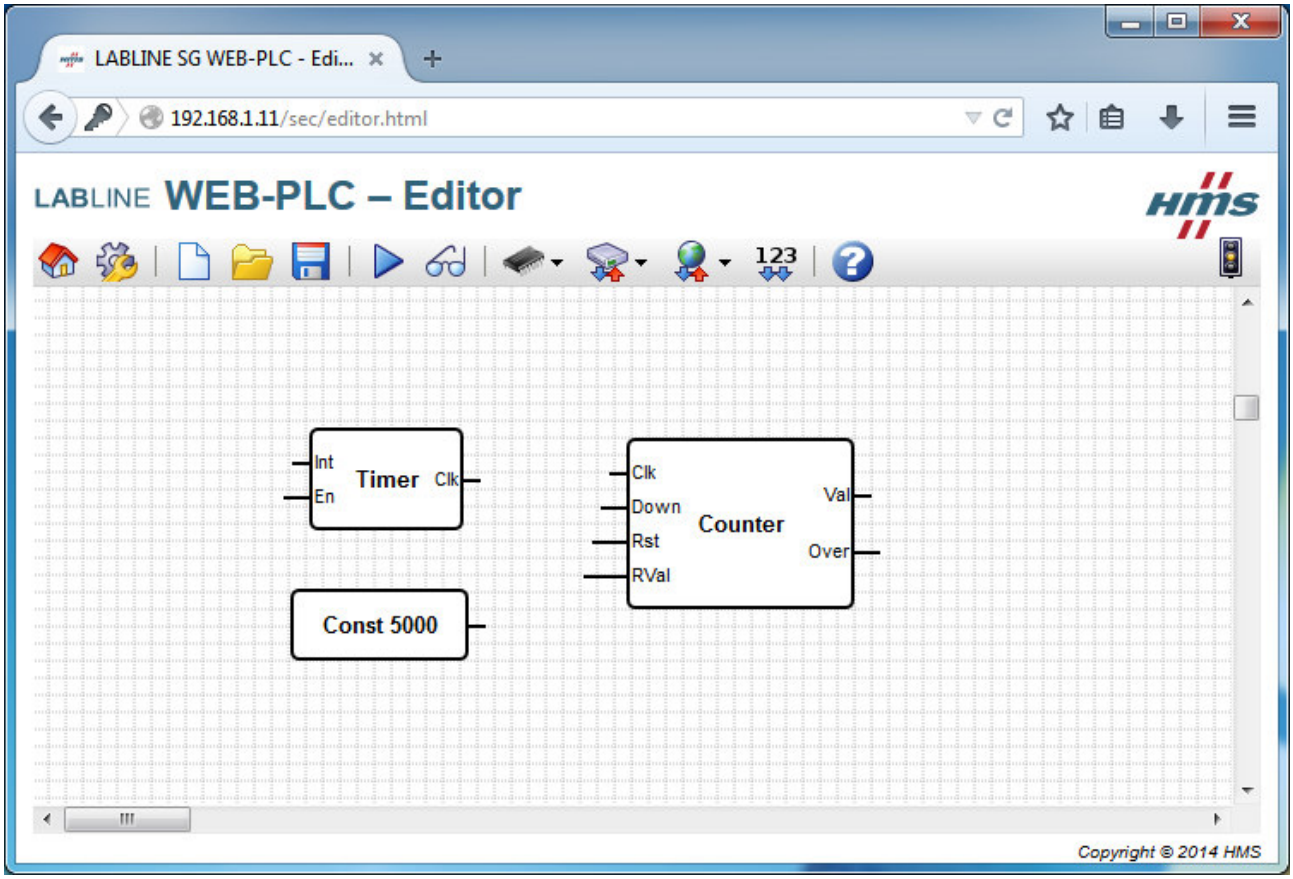
2.1.5 Create your application

Now let us enter our first diagram with the WEB-PLC editor. We will create a simple counter. At first we need to add some elements to the empty diagram.

1. Use the *Add* *unit* icon to add a timer and a counter unit.

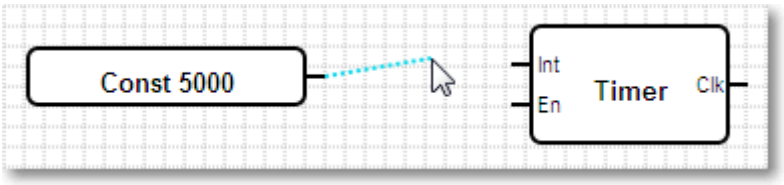
2. Click on the *Add constant* icon to add a constant. In the appearing dialog enter the value 5000 and press *OK*.

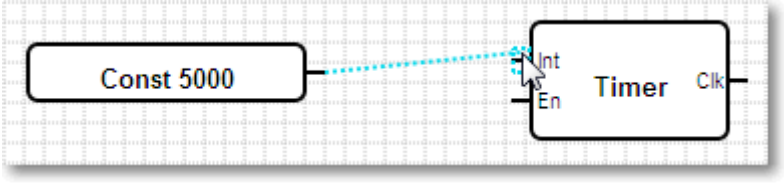
You can drag the elements on the diagram. Rearrange them so that they do not overlap. Now the diagram should look like this:



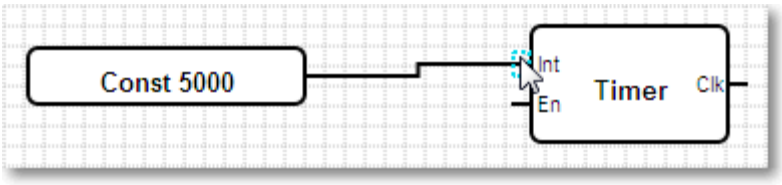
Next we will connect the elements. To create a connector between two ports press the left mouse button while the cursor is over one of the ports ...

... drag the appearing blue dotted line over another port ...



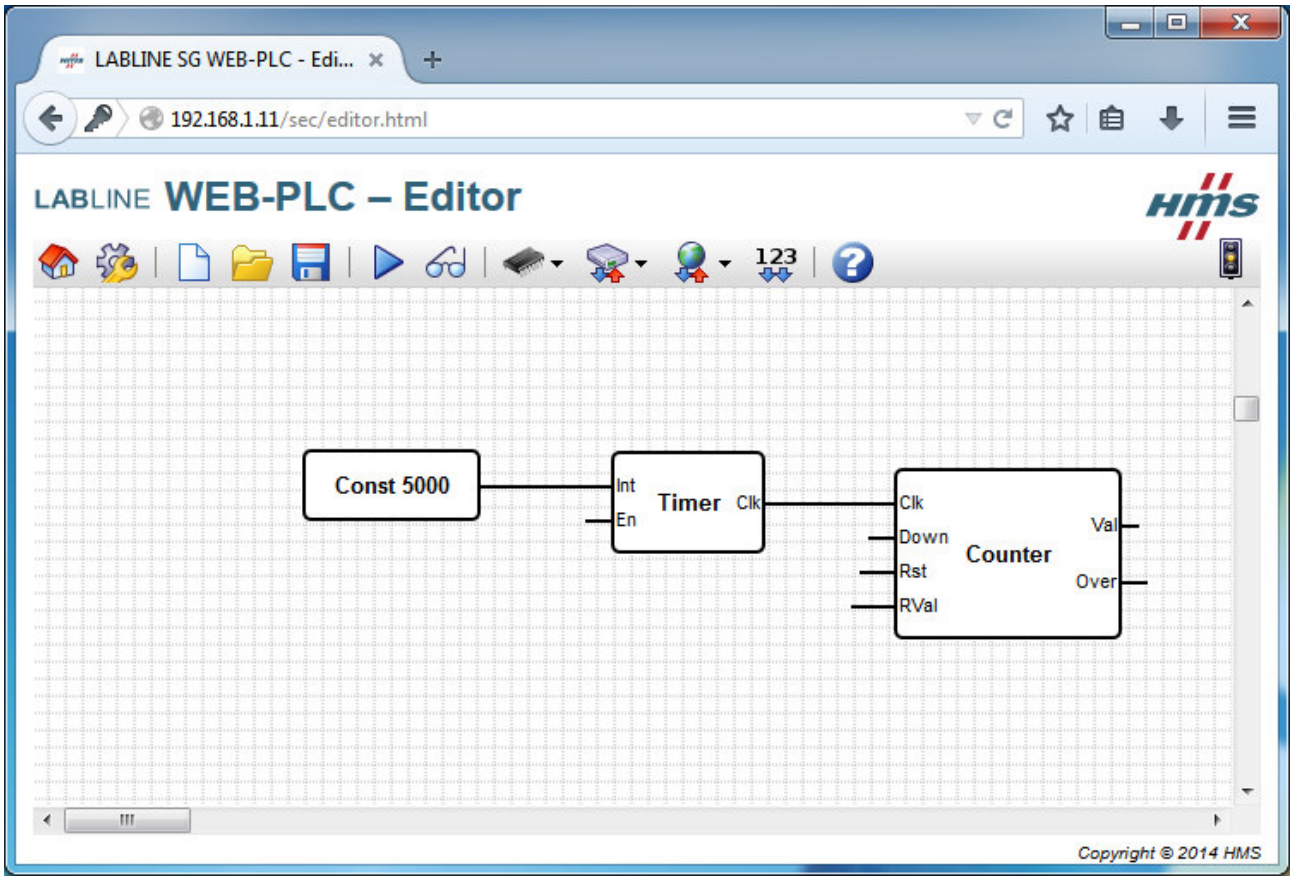


... and release the mouse button.

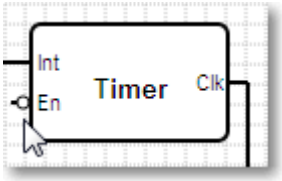


Use this method to connect the following ports:

- The port of the constant with the *Int* (interval) port of the timer unit
- The *Clk* (clock) port of the timer unit with the *Clk* port of the counter unit



The timer unit has an enable port (*En*), which must be unequal 0 to enable clock output. To achieve this, simply double-click on this port to negate it.



Now the timer unit will generate a clock signal with an interval of 5000 ms. The rising edge of the clock signal will trigger the counter unit to increment its value. Eventually the value will be stored into the portal variable.

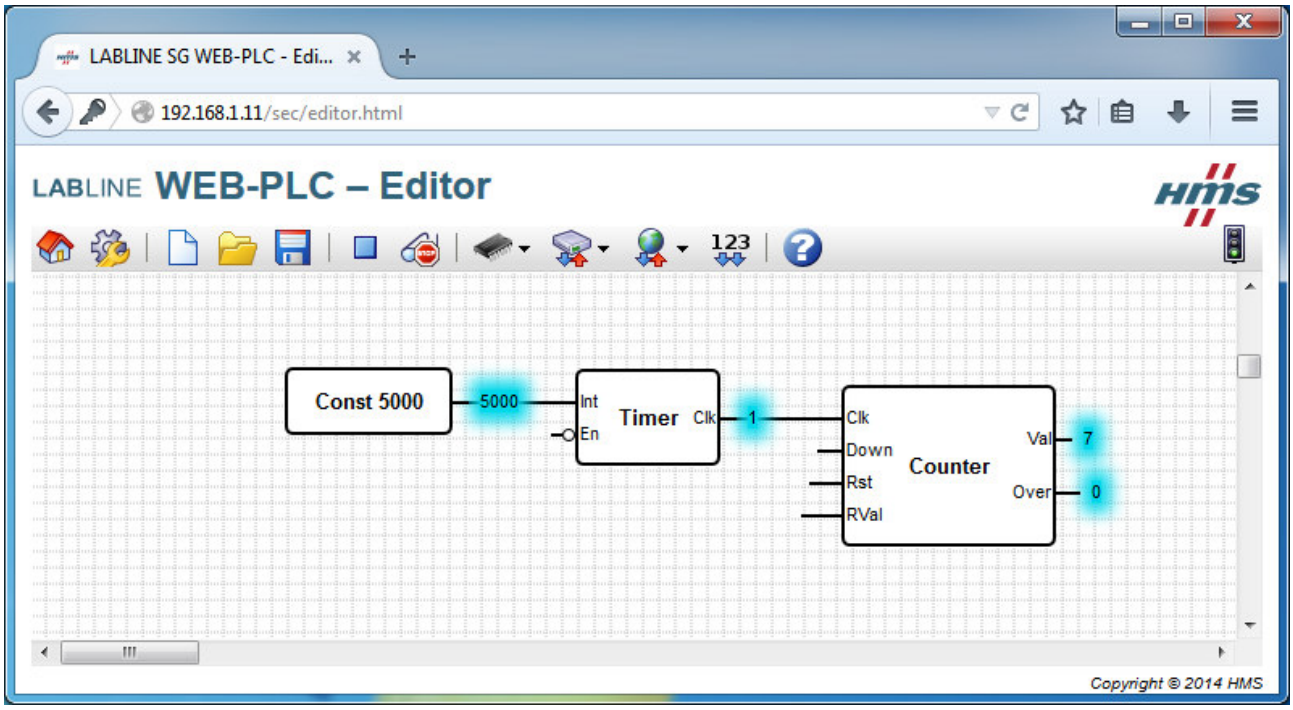
Press the *Save diagram* icon to store the diagram on the device.

Note that the traffic light in the toolbar has changed from red to amber. The device's status LED which indicates diagram execution (please refer to chapter 3.7) has been switched on.

2.1.6 Run your application

The diagram is now stored on the device but not being executed yet. To start execution, press the *Start* icon.

The traffic light in the toolbar changes to green and the status LED indicating diagram execution starts to blink. The diagram is now being processed and the counter value should be incrementing. But we don't see it. However there is a way to visualise the current status of the diagram in the editor. The function we need for this is called *Life View*. Press the *Start Life View* icon.



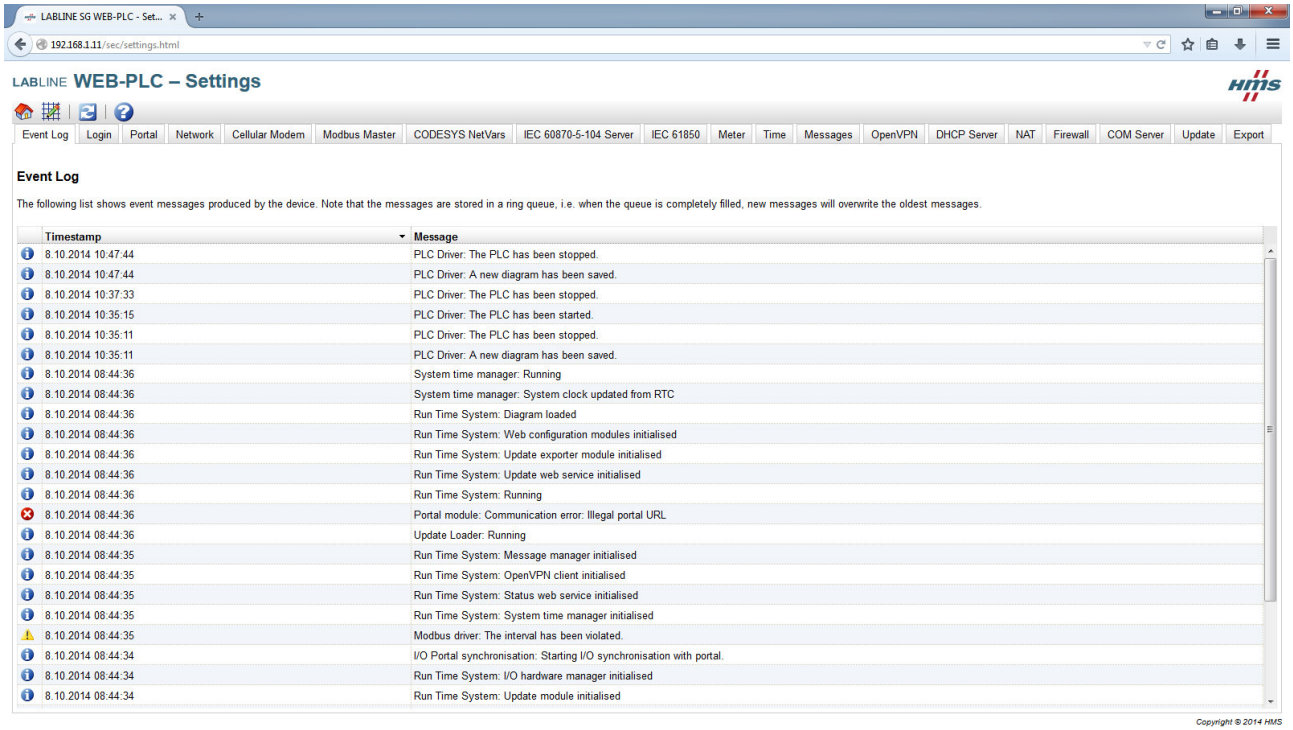
Now the value of each output port will be displayed next to the port. You can see that the value of the counter unit increments every 5 seconds.

2.1.7 Configure the device settings

Press the *Settings* icon to go to the settings page.

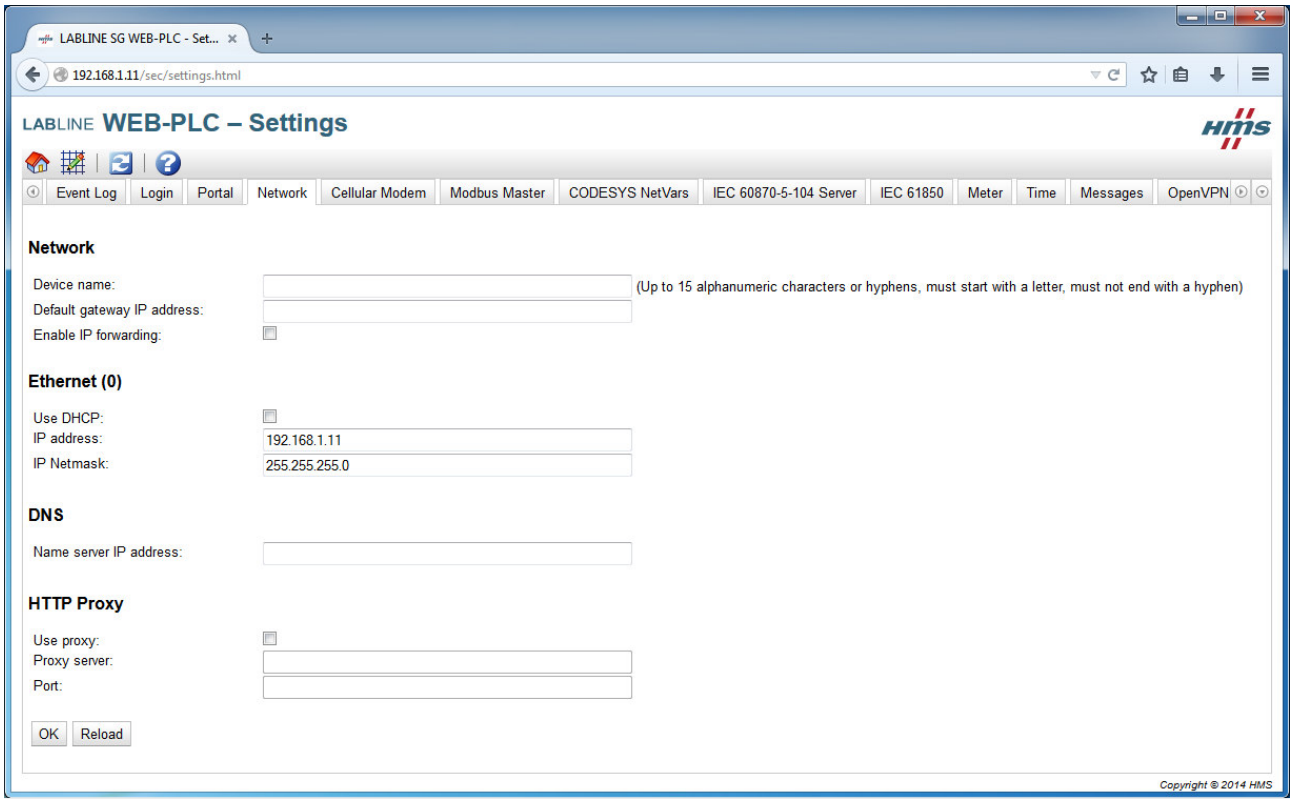
On the settings page there are several tabs on which you can adjust various configurations, e.g. login data, network settings (DHCP, firewall rules, NAT address translation, OpenVPN, etc…), cellular modem configuration, protocol settings (Modbus, IEC61850, IEC60870-5-104, M-Bus), and so on.

The first screen in the settings area is the event log, which displays all events (information messages, warnings and errors) generated by the device.



2.1.7.1 Network settings

In the Network tab you can enter or change the IP settings (IP address, network mask, activate/deactivate DHCP), as well as setting up a DNS server, a proxy server and internet gateway.



If you are in doubt regarding the settings on this tab, please ask your network administrator.

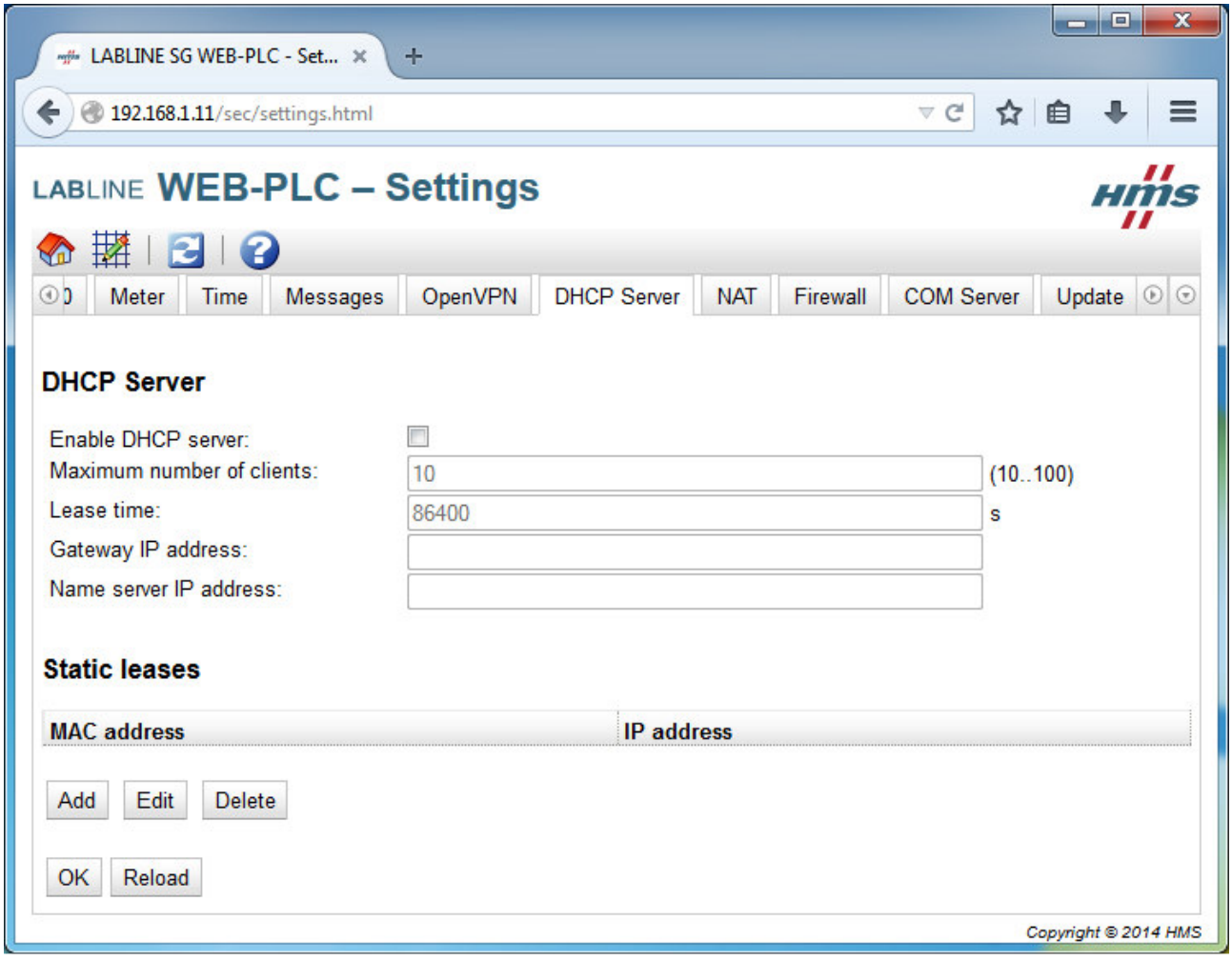
Press the *OK* button to store your changes. Then press the *Reboot* icon to restart your device in order to apply your changes.

2.1.7.2 DHCP

The WEB-PLC firmware features a Dynamic Host Configuration Protocol (DHCP) server, which you can activate and configure in this tab.

In the first section you have to configure the maximum number of clients that will be serviced (max. 100, including static mappings) and the leasing time. The server will lease IP addresses from the particular network except for his own. Additionally you can specify a gateway and name server IP addresses that will be distributed as well.

In the static leases section you can configure up to 10 static leases. A static lease will assure that a client with a special MAC address will be given a predefined IP address and that this IP address is not leased to another client. The MAC address of the client has to be noted without any delimiters (e.g. 003056A1DB30).



Press the *OK* button to store your changes. Then press the *Reboot* icon to restart your device in order to apply your changes.

2.1.7.3 Login

In this tab you can replace the default *hms* username/password combination with your own username/password. If you should ever forget the credentials, you can restore the factory settings by pressing the reset button (read chapter 3.11).

Press the *OK* button to store your changes. Then press the *Reboot* icon to restart your device in order to apply your changes.

2.1.7.4 Firewall

The firewall improves the device's security by analysing network traffic and blocking unallowed traffic. The firewall has a blocking policy, i.e. outgoing connections are generally allowed while incoming connections will be generally blocked except if there is a rule allowing this specific connection.

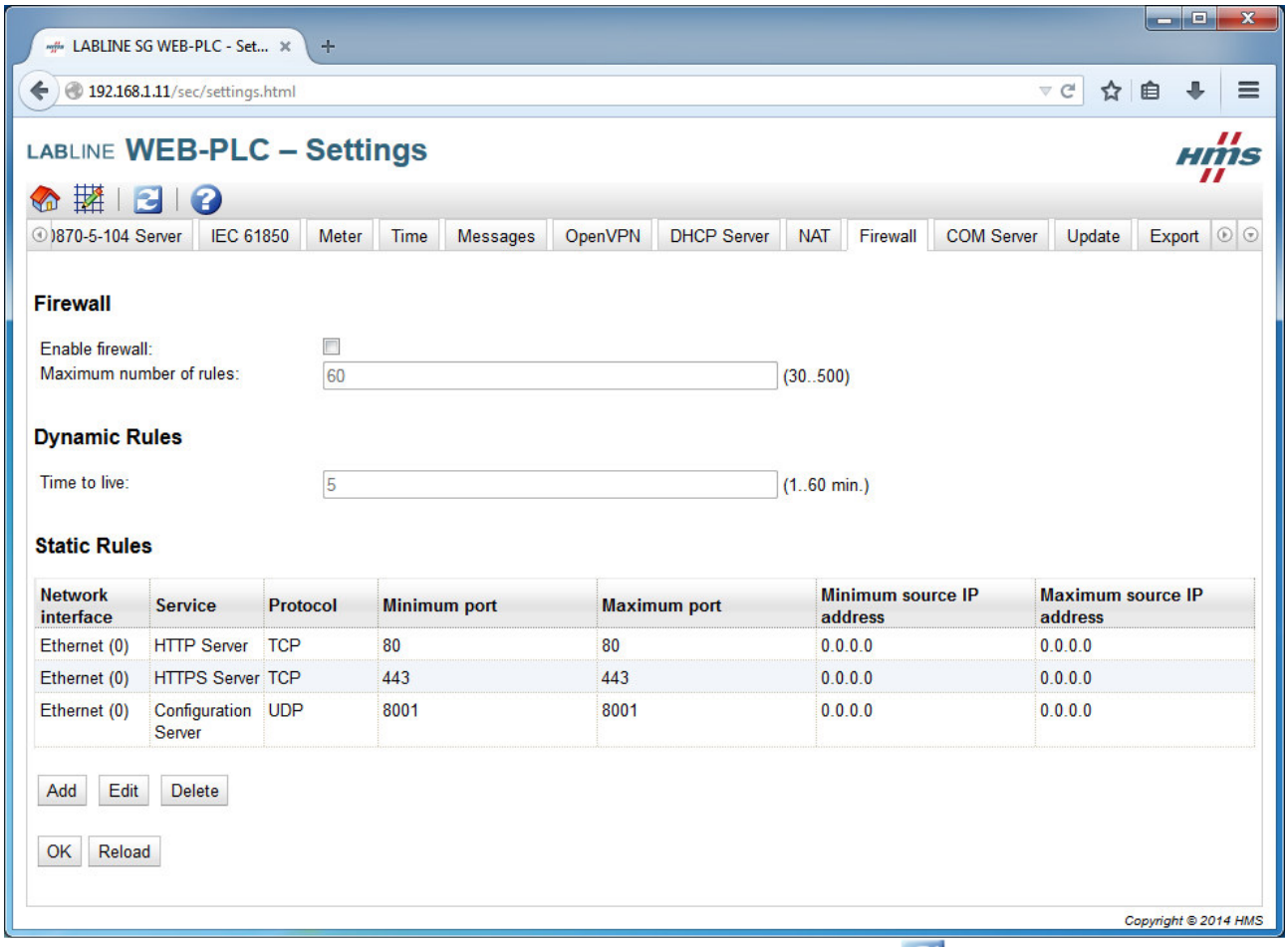
At the top of the settings form you can enable the Firewall and configure the maximum number of rules. This determines the number of connections (incoming and outgoing) that can be handled simultaneously.

When enabling the firewall, always make sure that you defined some static rules that allow you to access the webserver in order to be able to disable the firewall if needed. **If you enable the firewall without any appropriate rules, you will be unable to access your device in any way. You will need to reset the device to factory settings in this case.**

Dynamic rules are created by the firewall for outgoing connections. You have to configure how many minutes dynamic rules will be valid (time to live). Static rules allow access to a specific service on your device from the network. You can add up to 30 static rules. Each rule consists of the following parameters:

- Network interface: The network interface from which you want to accept connections.
- Service: Set of predefined services which you may want to allow to be connected to. If the desired service is not on the list, choose *Other* in order to manually specify the service's protocol and ports.
- Protocol: It determines which base protocol (TCP or UDP) the service you want to allow uses.
- Port range: It sets the port(s) where the service you want to allow runs on. You can specify a single port (set minimum and maximum to the same value) or a port range (e.g. 10000 to 10005). Or you can set both parameters to 0, which means that you want to allow connections on any port (wildcard).
- IP range: Determines the IP addresses you want to allow to connect to the specified service. You can specify a single IP address (set minimum and maximum to the same value) or an IP

address range (e.g. 192.168.0.1 to 192.168.0.10). Or you can set both parameters to 0.0.0.0, which means that you want to allow connections from any IP address (wildcard).



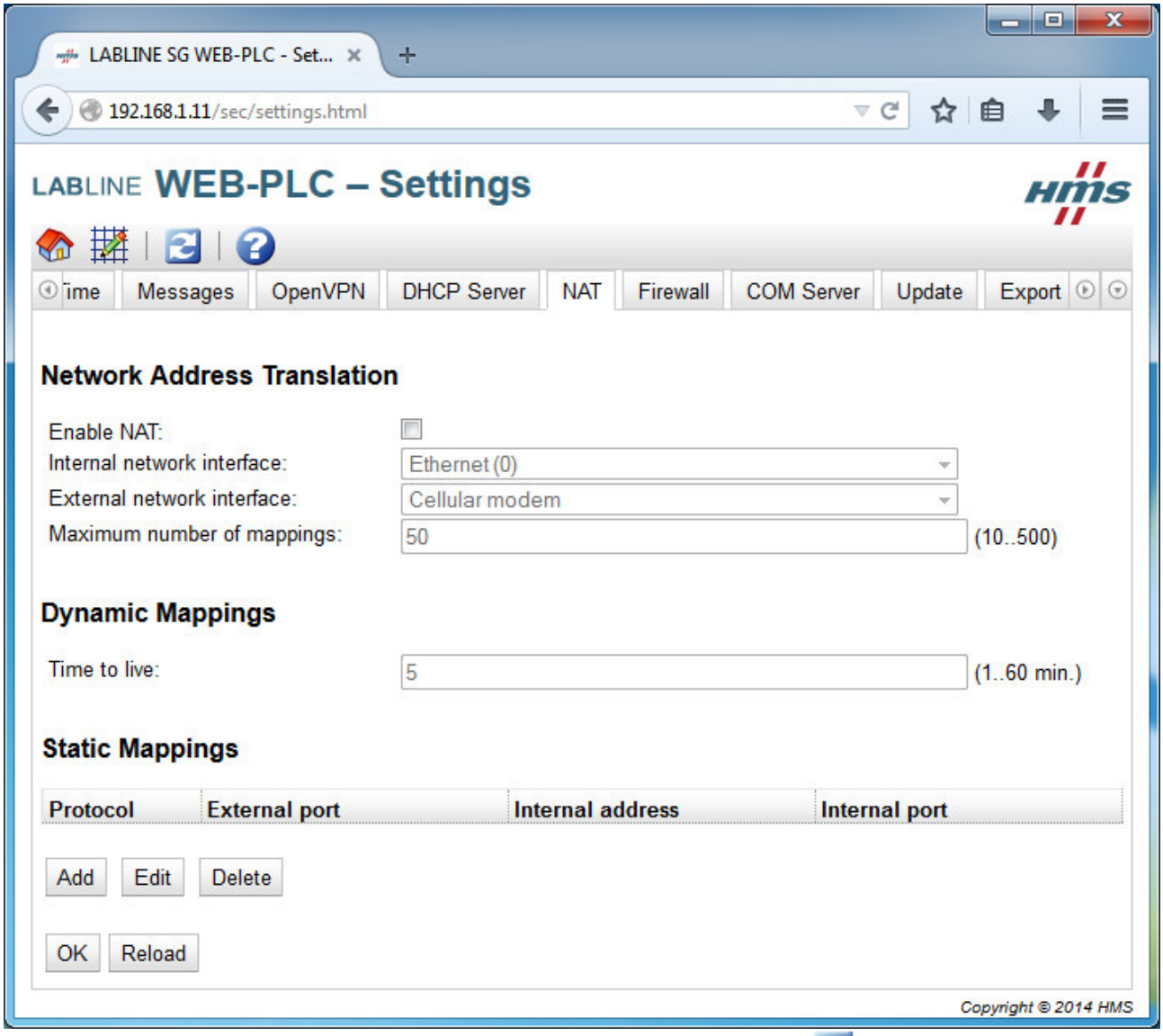
Press the *OK* button to store your changes. Then press the *Reboot* icon to restart your device in order to apply your changes.

2.1.7.5 NAT

The firmware is able to perform network and port address translation (aka NAT/PAT) in order to route traffic between a local (internal) and a global (external) network. This feature can for example be used to allow another device connected to the device's Ethernet interface (local network) to use the device's cellular modem internet connection (global network). At the top of the settings form you can enable the NAT service and configure the internal and external network interface as well as the maximum number of mapping entries. This is the number of connections (incoming and outgoing) that can be handled simultaneously.

Dynamic mapping is used to enable devices from the local network to access the global network. Requests from the local network will be given the device's global IP address and the replies will be routed to the respective local device. You have to configure how many minutes dynamic mappings will be valid (time to live). Static mappings are used to make a local device's service accessible from the global network under the SG device's global IP address. Up to 10 static mappings can be configured. For each you have to configure these four options:

- Protocol: TCP or UDP.
- External Port: The device's port at which the service should be reachable from the global network
- Internal Address: The IP address of the device in the local network.
- Internal Port: The port number at which the service is available on the device in the local network



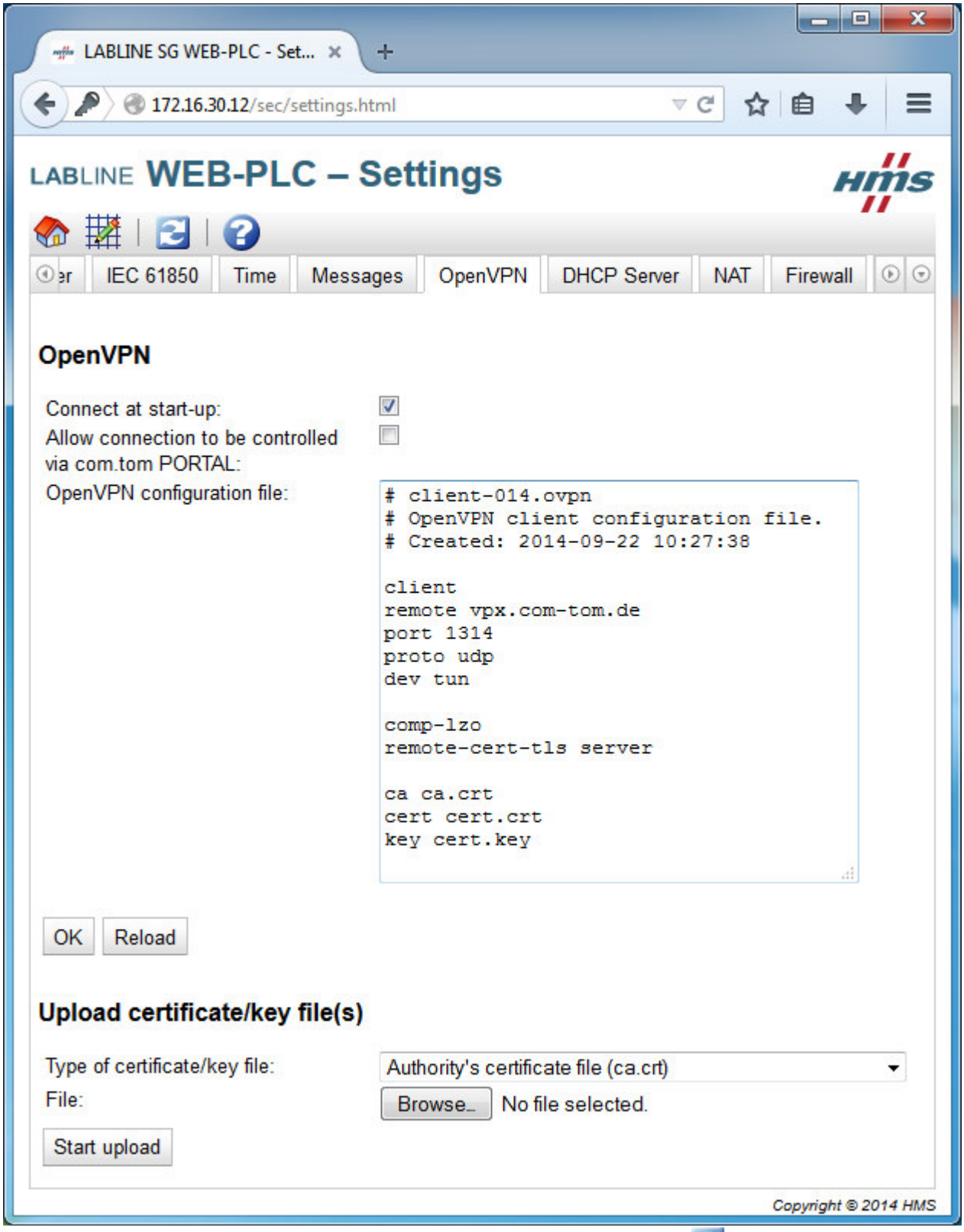
Press the *OK* button to store your changes. Then press the *Reboot* icon to restart your device in order to apply your changes.

2.1.7.6 openVPN

The firmware includes an OpenVPN client. You can use it to integrate your device into a virtual private network.

The large text input field can be used to edit the OpenVPN configuration file. Please refer to OpenVPN's documentation (http://openvpn.net/) for further information. Certificate files can be referenced without any path prefix. Changes to the OpenVPN configuration may take effect before re-starting the device when the OpenVPN connection is (re-)established. It is recommended to reboot the device shortly after changing the configuration to preserve a consistent state.

The bottom section can be used to upload various certificate and key files. Firstly choose which file you want to upload via the drop-down box. The items in the box also state the file names via which you can reference the uploaded file inside the configuration above. Secondly chose a file from the local file system and press the Start upload button. Certificates are temporarily stored to the SD card. They are deleted after being applied to the OpenVPN driver.

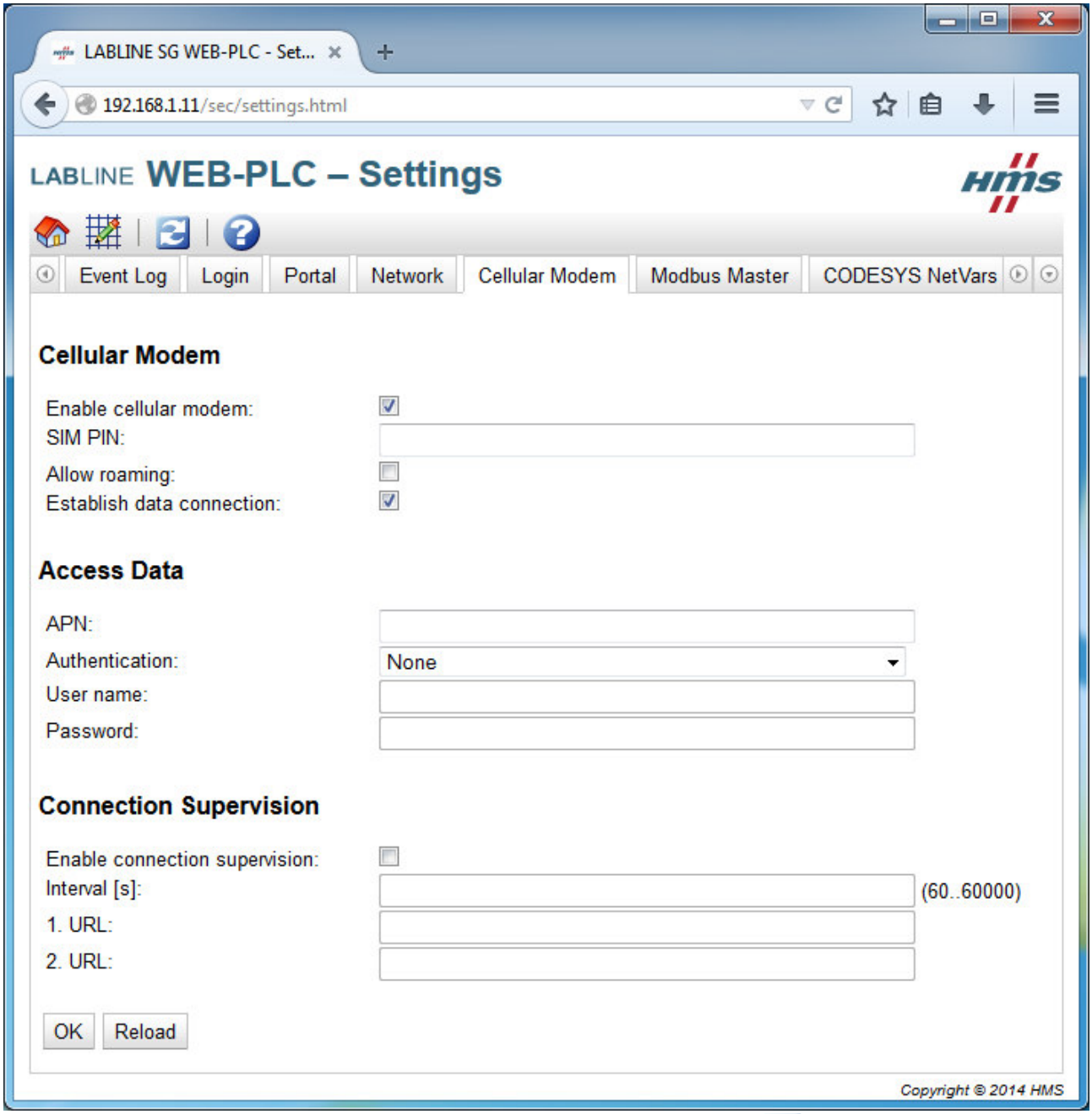


Press the *OK* button to store your changes. Then press the *Reboot* icon to restart your device in order to apply your changes.

2.1.7.7 Cellular modem settings

To activate the modem, check the Enable cellular modem checkbox. If your SIM card requires a PIN, enter it in the SIM PIN field. You can allow/disallow the modem to log into a network other than your home network (roaming). Note that roaming connections will normally produce higher costs. To establish a data connection via GPRS or UMTS, check the data connection box.

Enter your mobile phone provider's Access Point Name in the APN field. If the APN requires authentication, enter the appropriate values, too. If you don't have this information, contact your mobile phone provider.



Press the *OK* button to store your changes. Then press the *Reboot* icon to restart your device in order to apply your changes.

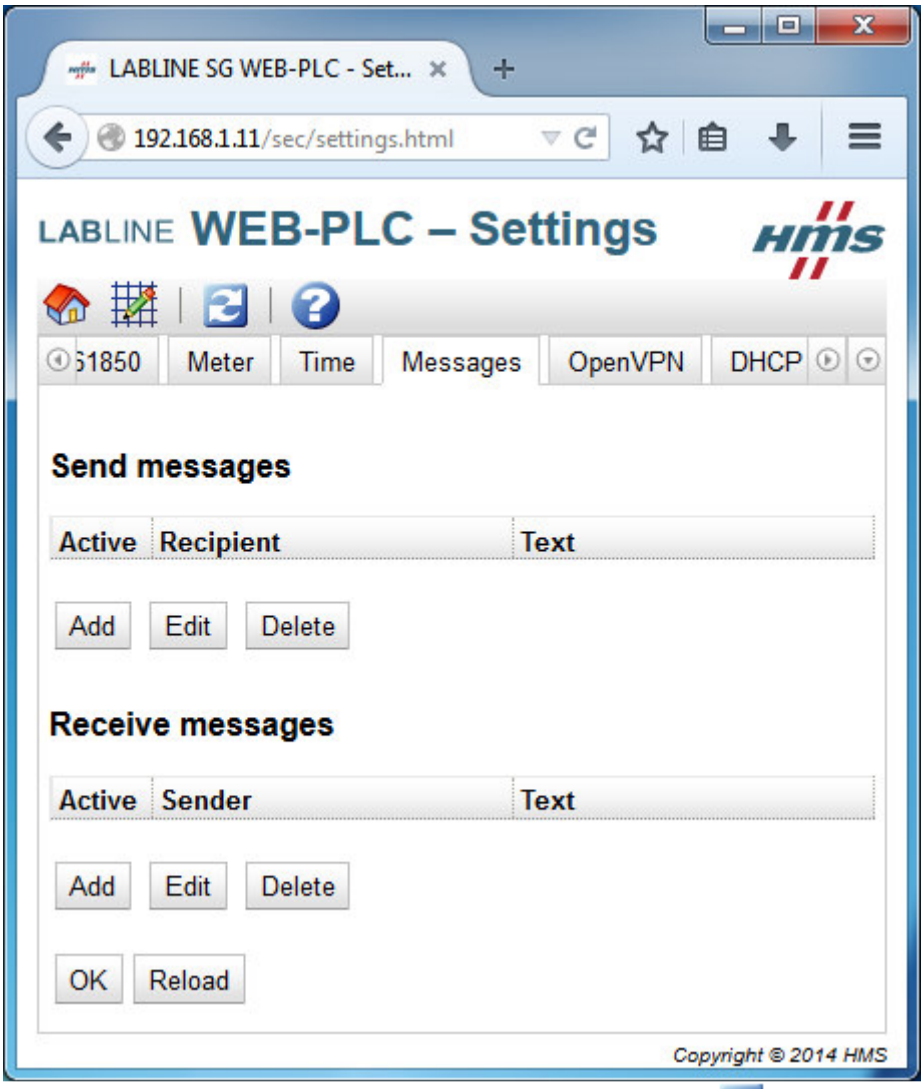
After some seconds the Modem LED will light up indicating that the cellular modem has been initialised. After about one minute the GSM/GPRS LED should light up indicating that an internet connection has been established via the modem.

2.1.7.8 SMS messaging

Your device is capable of sending and receiving messages. Currently only short messages via the mobile network (SMS) are supported.

Click on the Add button below the empty Send messages list in order to define a message that the device should send. A dialog will show up. First enter the recipient of the message, i.e. the phone number composed of an optional leading + and up to 30 numerical digits (e.g. +491701234567). Then define the text of the message, which must be composed of ASCII characters (latin characters, numbers, punctuation characters, no special signs, etc.). The input mask will not check the length of the text. If the text is too long for the transmission medium (SMS can contain up to 160 characters.), it will be cut. You can add references to variables, inputs or outputs to the text. Before a message is sent, the references will be replaced by the actual values.

In the Receive messages section you can configure up to ten messages that can be received by the device. For each message you have to configure a sender and a message text. For SMS, the sender must be a phone number. Note that the phone number must match exactly. Typically phone numbers are transmitted in international format (e.g. +491701234567), enter the phone number in this format. For the message text the same restrictions apply as for the send messages' text. If a short message with the defined text is received from the respective sender, the corresponding message receiving function will be triggered in your program.



Press the *OK* button to store your changes. Then press the *Reboot* icon to restart your device in order to apply your changes.

2.1.8 Protocol settings

The LABLINE SG gateways support multiple protocols. Please be aware that not all protocols are supported by each model. Read the corresponding chapter for your device model to learn which protocols are supported.

2.1.8.1 Modbus

All devices support Modbus TCP client and Modbus RTU master protocols. On the *Modbus Master* tab you can configure all Modbus parameters.

At the top there is a list of Modbus devices and their values. You can add, edit, delete or clone devices and values (input or output) via the buttons below the list. For each device or value the list shows a name, the communication parameters and an index. When adding or editing a device, a dialogue will show up where you can configure the following parameters:

- Name: The Modbus slave/server device's name, e.g. WAGO 750.
- Type: Here you have to select whether the device will be accessed via Modbus TCP or RTU. The Modbus RTU option will only be available after you have generally enabled Modbus RTU.
- Address (only present for Modbus RTU devices): Modbus slave device's address.
- IP Address (only present for Modbus TCP devices): Modbus server IP address, e.g. 192.168.1.173
- Port (only present for Modbus TCP devices): Modbus server TCP port number, typically 502.

When adding or editing an input/output register, another dialog with the following parameters will show up:

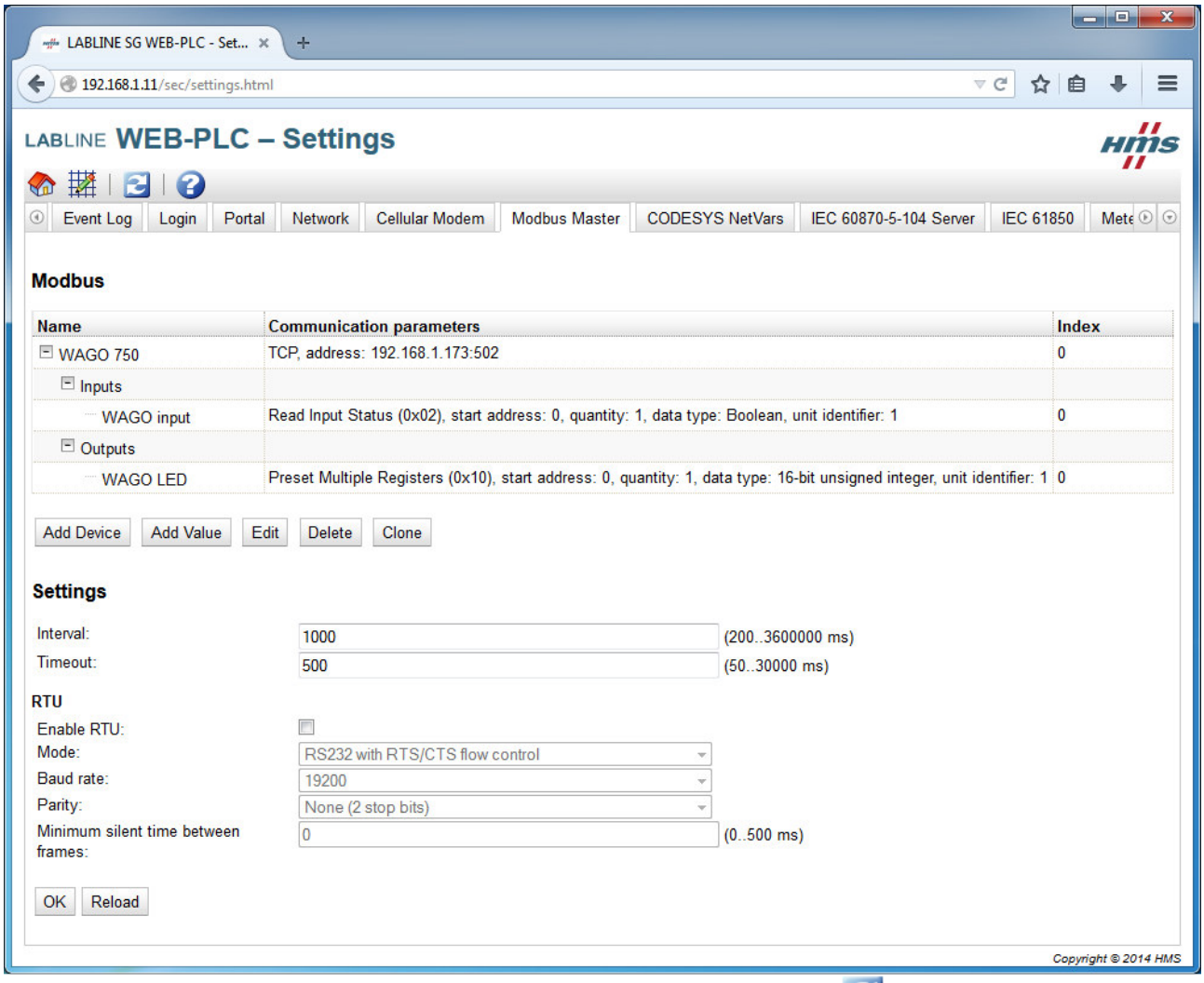
- Name: The register name.
- Unit identifier (only present for Modbus TCP servers): For Modbus TCP/RTU gateways this is the address of the RTU device to read/write from/to. For non-gateway devices this value should typically be 255.
- Function: Modbus function code used to read/write the value. The function code also defines whether the value is interpreted as an input or output.
- Start address: Register address to start reading/writing from/to. Note that addresses start at 0.
- Quantity: Number of registers/coils to read/write. If more registers/coils are read/written than fit into the selected data type (see below), the value will become an array. For example 2 registers would fit into one 32-bit unsigned integer value. The value would be scalar (no array). 4 registers would make up an array with 2 32-bit unsigned integer elements.
- Data type: Data type of the value.
- Swap words: Modbus transmits the two bytes of one register in network byte order (big endian). Thus for multi-register values, the registers are expected to be in the same order. However, some devices store multi-register values in the opposite order. This option can be used to correct the word order.

Up to 32 devices and 128 values are supported. However, since values can become arrays when reading/writing several registers/coils, there is another limit: **The number of all scalar (non-array) values plus the size of all arrays must not exceed 512**.

On the bottom part of the mask some general settings can be configured:

- Interval: Defines the interval in milliseconds in which all Modbus values will be read/written. Note that if the interval is too short to read/write all values, a warning message will be shown on the event log. In this case you should increase the interval.
- Timeout: Defines the maximum time in milliseconds to wait for the reply of a device when reading/writing one of its values or when connecting to a Modbus TCP device.
- Enable RTU: Enables Modbus RTU.

- Mode: Defines the mode for Modbus RTU. There are three possible options (RS232 with RTS/CTS flow control, RS232 without flow control, RS485).
- Baud rate: Defines the baud rate for Modbus RTU.
- Parity: Defines the parity (and stop bits) for Modbus RTU. There are four possible options (None -2 stop bits-, Odd, Even, None -1 stop bit-)
- Minimum silent time between frames: Defines the minimum time for which there has to be silence on the bus between two frames. The Modbus RTU driver calculates the silence time depending on the baud rate. Normally this should be sufficient. However you can use this setting to increase the silent time. If the time you configure here is less than the calculated time, your setting will be ignored.



Press the *OK* button to store your changes. Then press the *Reboot* icon to restart your device in order to apply your changes.

2.1.8.2 M-Bus

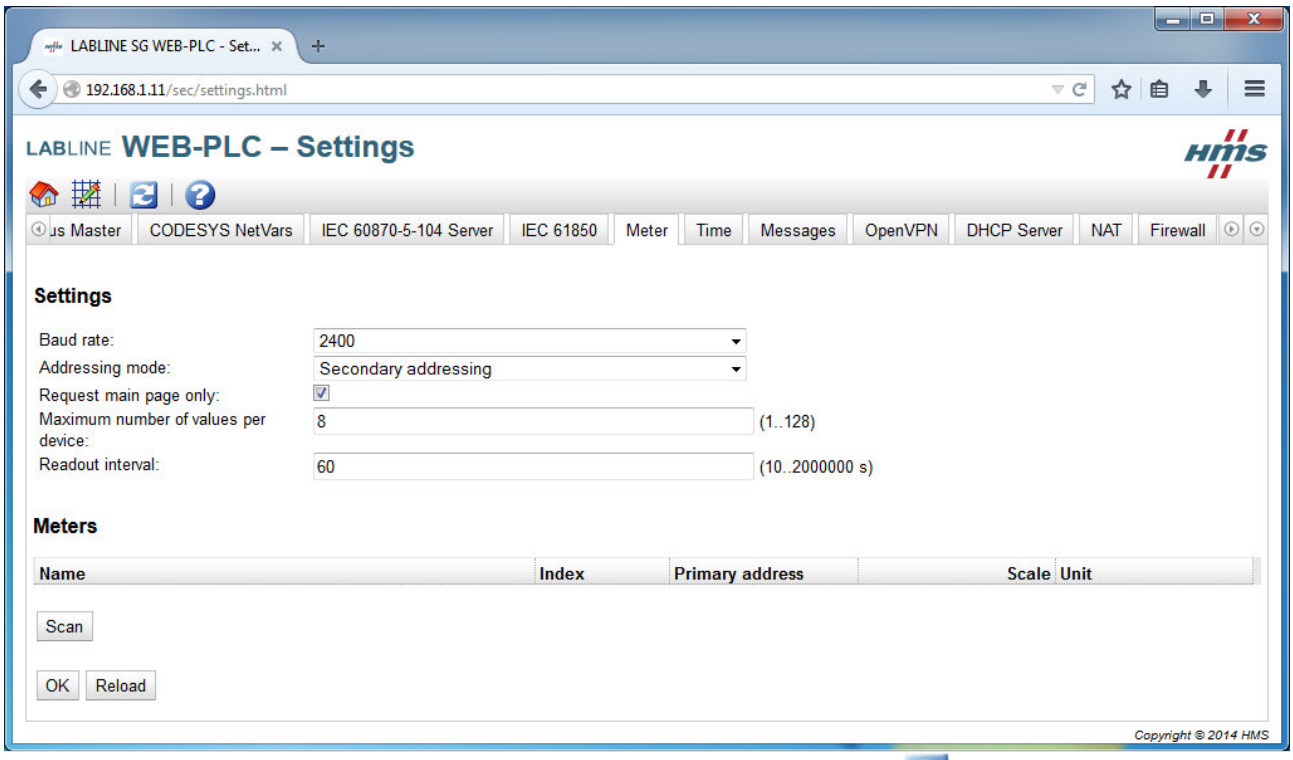
Some devices, e.g. LABLINE SG11, support M-Bus master protocol. On the *Meter* tab you can configure all M-Bus parameters. At the top of the page you can configure several settings:

- Baud rate: Baud rate at which the M-Bus will operate.
- Addressing mode: Mode used to address the M-Bus slave devices (primary or secondary).
- Request main page only: If this option is set, only the main page of each M-Bus device will be requested. Typically the main page contains the most important values.

- Maximum number of values per device: Number of values to be read from each device. Note that the **total number of values read from all devices is limited to 512** and that at least one value will be read from any device. **Up to 32 devices are supported**.
- Readout interval: Interval in seconds in which the M-Bus devices will be read.

After changing the physical bus configuration, you will typically scan the bus by clicking the scan button below the list. If you have chosen primary addressing, a dialog where you can set the address range to scan will be shown. After the scan has completed, the list will show the devices found. Then you should save the new configuration to the device by clicking the Save button and reboot the device.

A list of supported M-Bus meters is available at chapter 4.13.



Press the *OK* button to store your changes. Then press the *Reboot* icon to restart your device in order to apply your changes.

2.1.8.3 IEC60870-5-104

Some devices support an IEC60870-5-104 server.

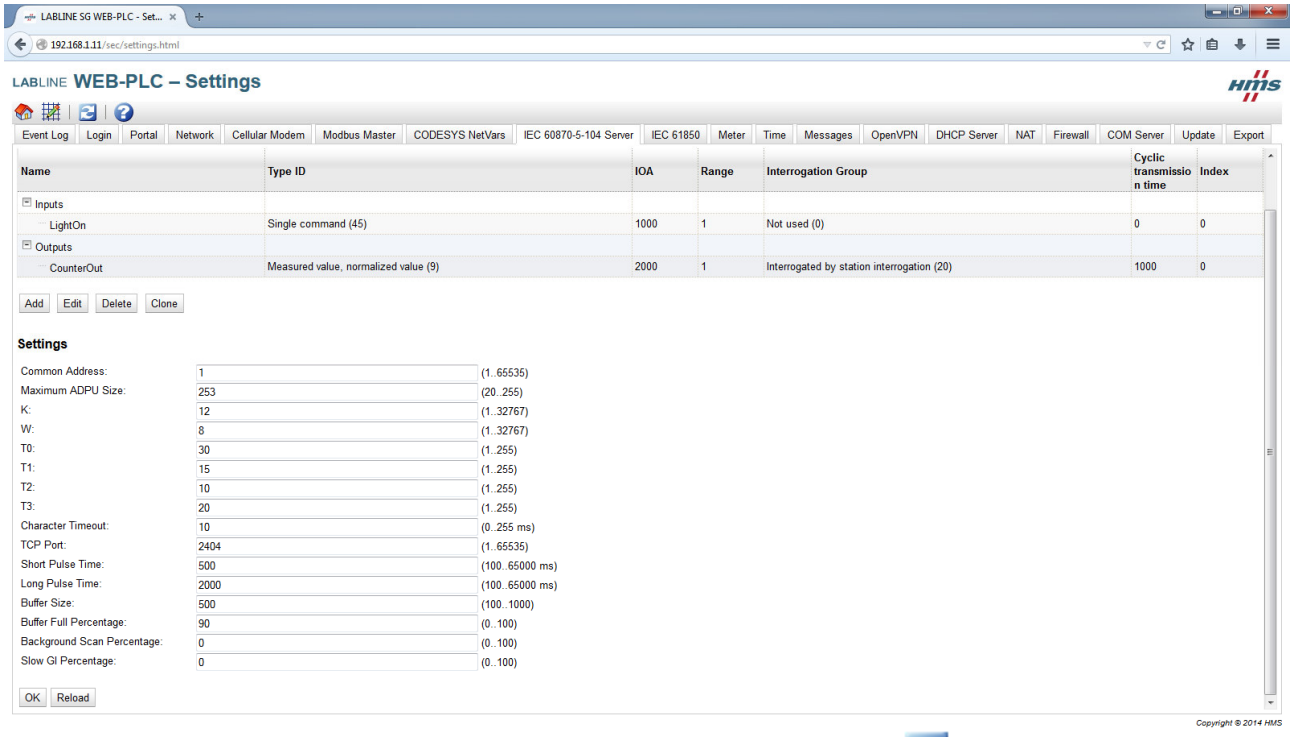
At the top there is a list of values (variables). You can add, edit, delete or clone values (input or output variables) via the buttons below the list. The list shows for each value a name, the type ID, information object address, range (number of conscutive objects), interrogation group, cyclic transmission time and an index. The range setting can be used to configurae a number of consecutive values. If the information object address is set to 1 and the range is set to 3, three values with the addresses 1, 2 and 3 will be created.

You can define **up to 128 values**. However, since values can become arrays when reading/writing several objects, there is another limit: The **total number of objects must not exceed 512**.

On the bottom part of the mask some general settings can be configured:

- Common Address: Server's common address.
- Maximum ADPU Size: Maximum Length of APDU.
- K: Number of unacknowledged I format ADPUs after which the connection will be closed.

- W: Number of received I format ADPUs after which reception will be acknowledged at the latest.
- T0: Timeout of connection establishment in seconds.
- T1: Timeout of send or test APDUs in seconds.
- T2: Timeout after which an S frame will be sent in seconds.
- T3: Timeout after which a test frame will be sent in case of long idle state in seconds.
- Character Timeout: Timeout for receiving character.
- TCP Port: TCP port number.
- Short Pulse Time: Short Pulse Time in milliseconds.
- Long Pulse Time: Long Pulse Time in milliseconds.
- Buffer Size.
- Buffer Full Percentage.
- Background Scan Percentage.
- Slow GI Percentage.



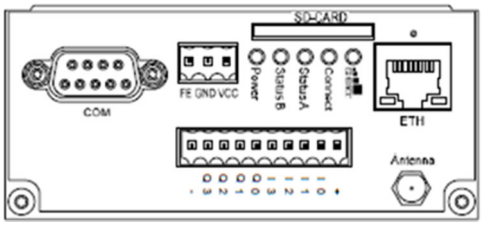
Press the *OK* button to store your changes. Then press the *Reboot* icon to restart your device in order to apply your changes.

2.2 Programming on C/C++

The last option to program custom applicatons for your LABLINE SG device is to code your application software directly on C/C++. This allows to have an absolute control over the device's hardware. Please contact HMS wit your application requirements and we will develop your custom application.

3 SG10

Following connectors and hardware interfaces are available on the device



3.1 General Data

Size (W x L x H)	46 x 103 x 63 mm
Operating temperature	0 bis 55 °C
Electrical shock	Class III
Protection rating	IP20
EMC emission	IEC 61000-6-4
EMC immunity	IEC 61000-6-2
Compliance	CE, RoHS

3.2 Electrical Data

Supply voltage	24 VDC (±15 %)
Active current	< 0.12 A (without I/Os)
	≤ 0.5 A / output

3.3 Power Supply

FE	Functional earth
GND	Ground
VCC	24 VDC

3.4 Digital I/Os

+	24 VDC
I0 - I3	Digital input, sink
Q0 - Q3	Digital output, source
-	Ground

3.5 Serial Interface

There are no resistors for line termination and line polarization in the device. The device itself does not need line polarization.

	RS232	RS485	RS422
Pin 1	NC	A(-/Y)	A(TxD)
Pin 2	RxD	NC	NC
Pin 3	TxD	NC	NC
Pin 4	NC	NC	A'(RxD)
Pin 5	GND	GND	GND
Pin 6	NC	B(+/Z)	B(TxD)
Pin 7	RTS	NC	NC
Pin 8	CTS	NC	NC
Pin 9	NC	NC	B'(RxD)
Housing	Connected to functional earth		

3.6 Ethernet Interface

Green LED	Link indication
Yellow LED	Activity indication

3.7 LEDs

Modem	Modem is initialized
GSM/GPRS	GPRS Internet Connection successful
Status A	n.a.
Status B	Diagram loaded (on) / executed (flashing)
Power	Device is powered

3.8 Other Interfaces

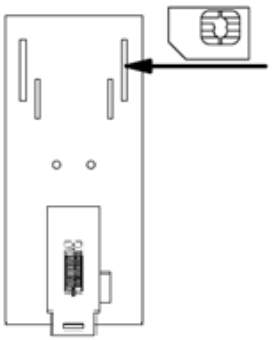
SD card interface	MMC/SD card
Antenna connector	SMA connector
SIM card interface	SIM card

3.9 SD card

Both MMC and SD cards are supported, SDIO cards are not supported.

3.10 SIM card

Insert the SIM card in the device's rear before the installation on the DIN rail. The device must be switched off.



In widely distributed systems or in environments without network infrastructure wireless solutions are required for the simplest telecontrol/remote maintenance functions. The communication mechanism of the SG gateways ensures problem-free use in all wireless networks without the need for special SIM cards.

Never use the device in areas where the operation of wireless equipment is prohibited. The location for the antenna must guarantee the recommended radiological limits (be at least 20 cm from persons and other antennas). When the antenna is installed outdoors the lightning protection standard VDE V0185 must be complied with. The EMC lightning protection zone concept must be observed. The device must be switched off during work on the antenna. It cannot be guaranteed, that there will not be any harmful interference for other devices. In case of interferences install the device or the antenna in another location.

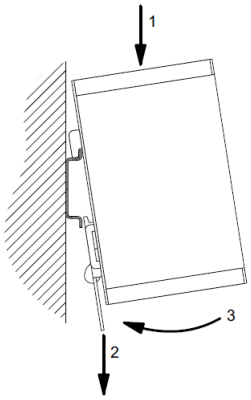
3.11 Reset button

The reset button is used to restore back factory settings. It's externally accessible through a small hole next to the Ethernet connector with a pointed object such as a straightened out paper clip. Hold the reset button pressed while the device is starting. Release the button when the reset is acknowledged by flashing the Status A LED twice. **Warning: All settings will be lost!**

3.12 Commissioning

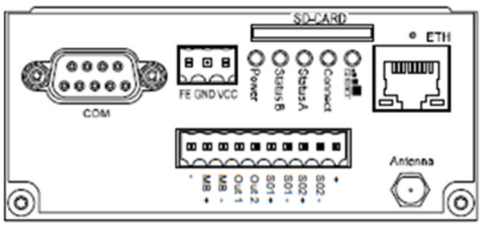
Device may only be put into service and operated by qualified personnel. The device is designed for an installation on a grounded 35 mm DIN rail in dry rooms. After the installation the housing of the device is connected with functional earth.

The power supply must be a grounded circuit (PELV). The power supply must be a limited power source according to EN60950-1 Cap. 2.5 or the device must be provided with an anti-surge fuse of 2A. The digital I/Os are provided with a detached anti-surge fuse of 4A.



4 SG11

Following connectors and hardware interfaces are available on the device



4.1 General Data

Size (W x L x H)	46 x 103 x 63 mm
Operating temperature	0 bis 55 °C
Electrical shock	Class III
Protection rating	IP20
EMC emission	IEC 61000-6-4
EMC immunity	IEC 61000-6-2
Compliance	CE, RoHS

4.2 Electrical Data

Supply voltage	24 VDC (±15 %)
Active current	< 0.12 A (without I/Os) ≤ 0.5 A / output

4.3 Power Supply

FE	Functional earth
GND	Ground
VCC	24 VDC

4.4 Digital I/Os

+	24 VDC
S01,S02	Digital pulse input, source
Out1, Out2	Digital output, source
MB+, MB-	M-Bus
-	Ground

4.5 Serial Interface

There are no resistors for line termination and line polarization in the device. The device itself does not need line polarization.

	RS232	RS485	RS422
Pin 1	NC	A(-/Y)	A(TxD)
Pin 2	RxD	NC	NC
Pin 3	TxD	NC	NC
Pin 4	NC	NC	A'(RxD)
Pin 5	GND	GND	GND
Pin 6	NC	B(+/Z)	B(TxD)
Pin 7	RTS	NC	NC
Pin 8	CTS	NC	NC
Pin 9	NC	NC	B'(RxD)
Housing	Connected to functional earth		

4.6 Ethernet Interface

Green LED	Link indication
Yellow LED	Activity indication

4.7 LEDs

Modem	Modem is initialized
GSM/GPRS	GPRS Internet Connection successful
Status A	n.a.
Status B	Diagram loaded (on) / executed (flashing)
Power	Device is powered

4.8 Other Interfaces

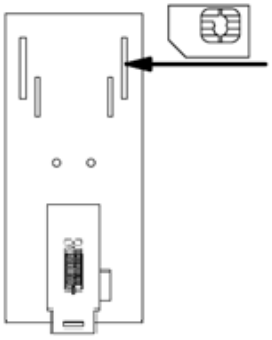
SD card interface	MMC/SD card
Antenna connector	SMA connector
SIM card interface	SIM card

4.9 SD card

Both MMC and SD cards are supported, SDIO cards are not supported.

4.10 SIM card

Insert the SIM card in the device's rear before the installation on the DIN rail. The device must be switched off.



In widely distributed systems or in environments without network infrastructure wireless solutions are required for the simplest telecontrol/remote maintenance functions. The communication mechanism of the SG gateways ensures problem-free use in all wireless networks without the need for special SIM cards.

Never use the device in areas where the operation of wireless equipment is prohibited. The location for the antenna must guarantee the recommended radiological limits (be at least 20 cm from persons and other antennas). When the antenna is installed outdoors the lightning protection standard VDE V0185 must be complied with. The EMC lightning protection zone concept must be observed. The device must be switched off during work on the antenna. It cannot be guaranteed, that there will not be any harmful interference for other devices. In case of interferences install the device or the antenna in another location.

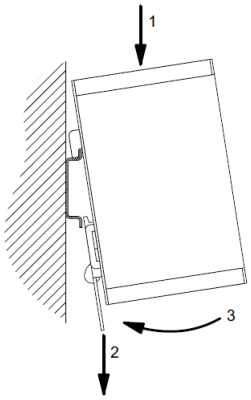
4.11 Reset button

The reset button is used to restore back factory settings. It's externally accessible through a small hole next to the Ethernet connector with a pointed object such as a straightened out paper clip. Hold the reset button pressed while the device is starting. Release the button when the reset is acknowledged by flashing the Status A LED twice. **Warning: All settings will be lost!**

4.12 Commissioning

Device may only be put into service and operated by qualified personnel. The device is designed for an installation on a grounded 35 mm DIN rail in dry rooms. After the installation the housing of the device is connected with functional earth.

The power supply must be a grounded circuit (PELV). The power supply must be a limited power source according to EN60950-1 Cap. 2.5 or the device must be provided with an anti-surge fuse of 2A. The digital I/Os are provided with a detached anti-surge fuse of 4A.



4.13 M-Bus compatible devices

The following M-Bus devices have been successfully tested with the LABLINE SG gateways. Devices that are not included on this list might also communicate successfully with the SG gateway.

Ordered alphabetically **by vendor**:

1. ABB AG
    a. Electricity meter
        i. DDM 13000 (M-Bus)
2. EasyMeter GmbH
    a. Electricity meter
        i. Q3D (RS-232 over D0 opto-head)
3. Elster GmbH
    a. Electricity meter
        i. A1350 (RS-485)
        ii. A1350 (CL)
        iii. A1500 (CL)
    b. Water meter
        i. S100 EV-A PICOFLUX (M-Bus)
    c. Gas meter
        i. BK-G4 (M-Bus)
4. EMH metering GmbH & Co. KG
    a. Electricity meter
        i. eHZ-H (SML over wireless M-Bus)
        ii. EIZ-E (M-Bus)
5. Flonidan DC A/S
    a. Gas meter
        i. Uniflo G4EM (M-Bus)
        ii. Uniflo G4ER (wireless M-Bus)
6. HYDROMETER GmbH
    a. Water meter
        i. Flypper (M-Bus)
7. INNOTAS Elektronik GmbH
    a. Heat meter
        i. EurisII (wireless M-Bus)
8. ITF Fröschl GmbH
    a. Electricity meter
        i. FROETEC-SIMPLEX ZN91 (RS-485)
9. Kamstrup A/S
    a. Electricity meter
        i. Kamstrup 382 (wireless M-Bus)
10. Landis+Gyr GmbH
    a. Gas meter
        i. Libra 350 i (M-Bus)
    b. Heat meter
        i. ULTRAHEAT UH50 (M-Bus)
        ii. ULTRAHEAT XS (M-Bus)
11. NORDWESTDEUTSCHE ZÄHLERREVISION ING. AUG. KNEMEYER GMBH & CO. KG
    a. Electricity meter
        i. DHZ 5(63)A M-Bus (M-Bus)

ii. DHZ 5(65)A M-Bus (M-Bus)

12. Qundis GmbH
    a. Heat meter
        i. WHE 460 (wireless M-Bus)
13. Siemens AG
    a. Heat meter
        i. ULTRAHEAT UH50 (M-Bus)
14. SMARVIS GmbH
    a. Heat meter
        i. WHE 467 (wireless M-Bus)
    b. Heat meter
        i. WFM26 (wireless M-Bus)
    c. Water meter
        i. WMC36 (wireless M-Bus)
        ii. WMH36 (wireless M-Bus)

Ordered alphabetically **by type**:

1. Electricity meter
    a. ABB AG
        i. DDM 13000 (M-Bus)
    b. EasyMeter GmbH
        i. Q3D (RS-232 over D0 Opto-Head)
    c. Elster Messtechnik GmbH
        i. A1350 (RS-485)
        ii. A1350 (CL)
        iii. A1500 (CL)
    d. EMH metering GmbH & Co. KG
    e. eHZ-H (SML over wireless M-Bus)
        i. EIZ-E (M-Bus)
    f. ITF Fröschl GmbH
        i. FROETEC-SIMPLEX ZN91 (RS-485)
    g. Kamstrup A/S
        i. Kamstrup 382 (wireless M-Bus)
    h. NORDWESTDEUTSCHE ZÄHLERREVISION ING. AUG. KNEMEYER GMBH & CO. KG
        i. DHZ 5(63)A M-Bus (M-Bus)
        ii. DHZ 5(65)A M-Bus (M-Bus)
2. Gas meter
    a. Elster GmbH (Instromet)
        i. BK-G4 (M-Bus)
    b. Flonidan DC A/S
        i. Uniflo G4EM (M-Bus)
        ii. Uniflo G4ER (wireless M-Bus)
    c. Landis+Gyr GmbH
        i. Libra 350 i (M-Bus)
3. Heat meter
    a. INNOTAS Elektronik GmbH
        i. EurisII (wireless M-Bus)
    b. Landis+Gyr GmbH
        i. ULTRAHEAT UH50 (M-Bus)
        ii. ULTRAHEAT XS (M-Bus)
    c. QUNDIS GmbH

i. WHE 460 (wireless M-Bus)

d. Siemens AG
   i. ULTRAHEAT UH50 (M-Bus)

e. SMARVIS GmbH
   i. WFM26 (wireless M-Bus)
   ii. WHE 467 (wireless M-Bus)

4. Water Meter
   a. Elster Messtechnik GmbH
      i. S100 EV-A PICOFLUX (M-Bus)
   b. HYDROMETER GmbH
      i. Flypper (M-Bus)
   c. SMARVIS GmbH
      i. WMC36 (wireless M-Bus)
      ii. WMH36 (wireless M-Bus)