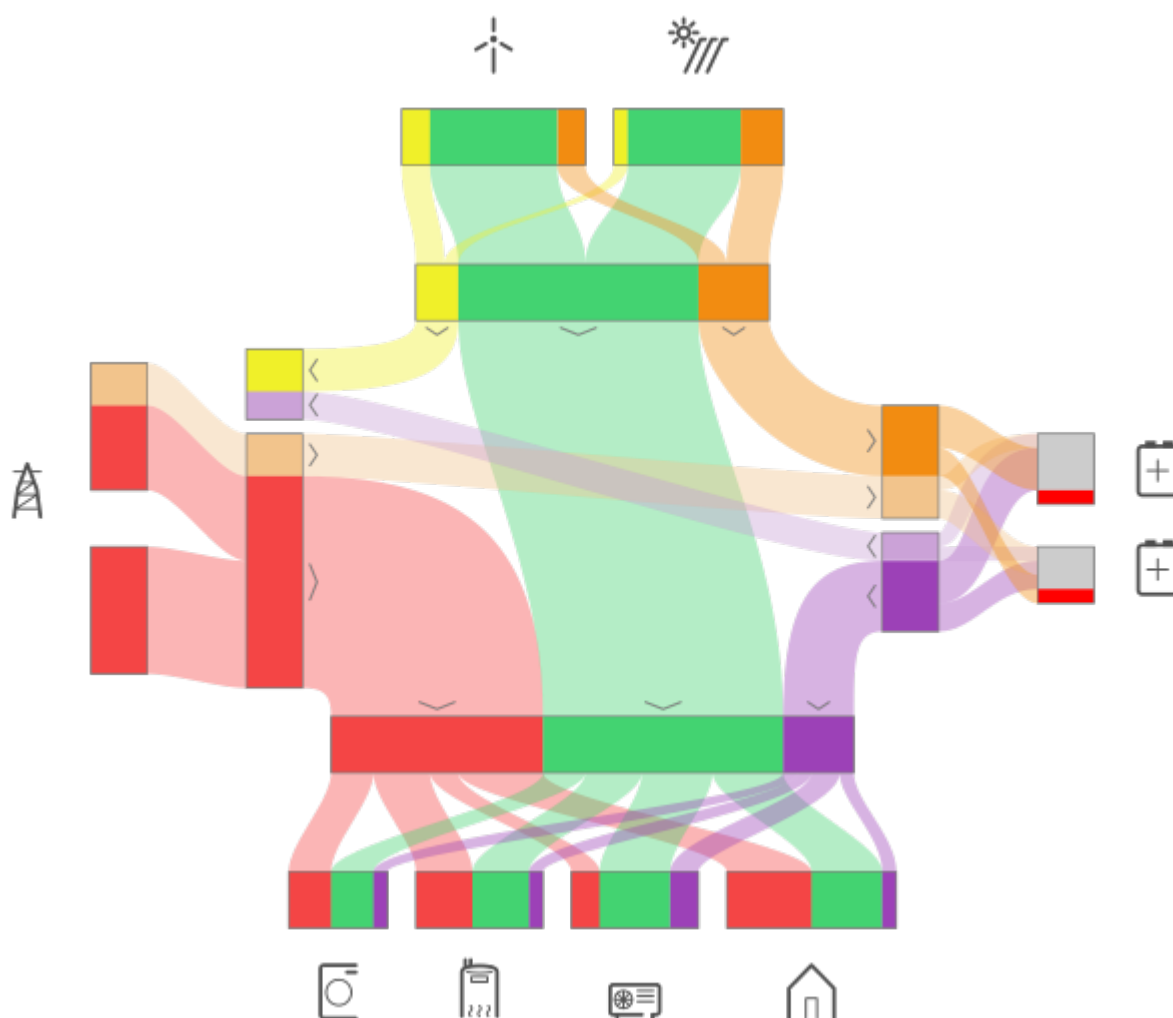


## HEMS Introduction

Home Energy Management System (HEMS) is a system for:

- monitoring electricity flows at home (consumption, production and storage),
- control of key consumers,
- optimizing consumption in terms of reducing consumption and using cheaper energy to ensure the same comfort with lower costs.



## HEMS Controller

It consists of an HEMS master controller ([MC-230](#)).

## Power sensors

The measurement of electrical power and energy of all energy sources and main electrical consumers is provided by single-phase ([PM1-E-D](#)) and three-phase ([PM3-I-D](#) and [PM3-E-D](#)) power sensors which are connected directly to HEMS master controller [MC-230](#). It supports:

- **1 grid** power sensor
- up to **3** sensors for local power **plants** (PV, Wind, Cogeneration, Generator, etc)
- up to **2** local **storage** systems (home battery)
- up to **4** managed **consumers** (electrical heating, electrical water heater, washing machine, tumble dryer, ...)

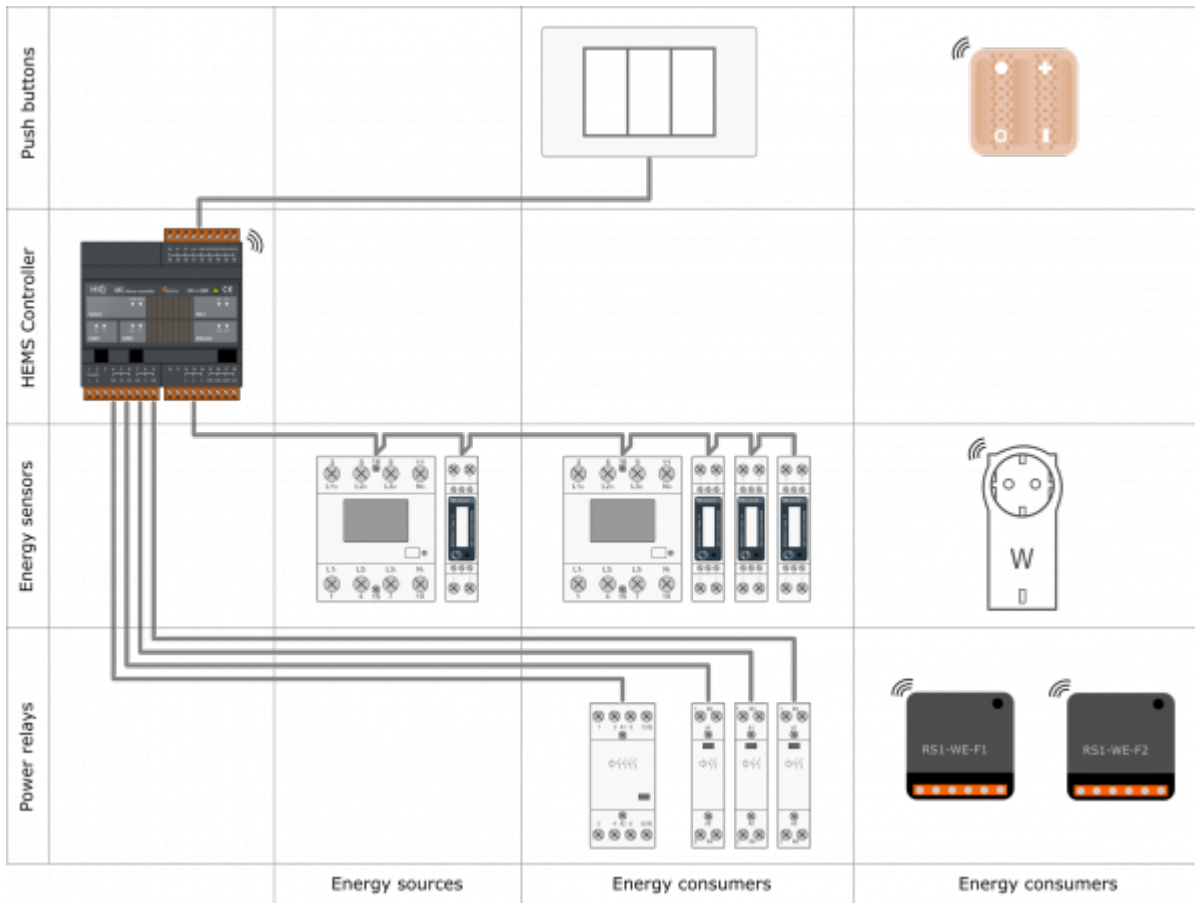
The measurement of main electrical consumers is also possible with wireless modules ([Metering smart plug](#) and [Micro smart plug](#)) which are paired to HEMS master controller [MC-230](#). It supports up to **8** managed **consumers**.

## Power relays

Are used for control of managed consumers. Power relays are toggling power supply or enabling signal for the operation of the device. They are controlled directly from HEMS master controller [MC-230](#).

## Push buttons

Are used for manual control of managed devices. Push buttons are directly wired or paired ([Soft remote](#)) and to HEMS master controller [MC-230](#).



# SAFETY INSTRUCTIONS



Use the following safety guidelines to ensure your own personal safety and to protect your equipment and working environment from potential damage.

**NOTICE:** All applicable local and national codes that regulate the installation and operation of the equipment must be strictly followed.

**NOTICE:** Installation and electrical connection of the equipment must be carried out by qualified and authorized personnel.

---

Notices which require special attention are highlighted with following symbols:

-  **WARNING** - which indicates that death, severe personal injury or substantial property damage can result if proper precautions are not taken.
  -  **CAUTION** - which indicates that minor to medium personal injury or property damage can result if proper precautions are not taken.
- 

This product can only function correctly if it is transported, stored, set up and installed correctly, and operated and maintained as recommended according to manufacturer's instructions.



**WARNING:** Failure to comply with manufacturer's safety and installation instructions or applicable codes and standards can result in damage to equipment or serious injury to personnel.



**WARNING:** Before installing, servicing or repairing electrical equipment power source must be disconnected.



**CAUTION:** Don't try to open the device, any interference or change may impact device's properties and significantly affect safety.

- The device must be installed inside electrical enclosure where it cannot endanger people or environment.
- During operation, device must not be exposed to high temperature, high humidity, excessive dust, corrosive gases, vibration or shock.
- All connected wires must comply with manufacturer's specifications.
- For installation use only tools and equipment with non-conducting handles.
- Sufficient ventilation space has to be assured around device for proper operation.
- The manufacturer does not undertake any liability for material or personal damage resulting from use or handling which is not in accordance with the manufacturer's safety instructions.

# Master Controller

## Advanced Controller



Model number:	<b>MC-230-01</b>	230 VAC, 11 IO, Enocan, 2 × RS232, RS485, IEX2 terminals
	<b>MC-230-02</b>	230 VAC, 11 IO, 2 × RS232, RS485, IEX2 terminals
	<b>MC-230-03</b>	230 VAC, 11 IO, Enocan, 2 × RS232, isolated RS485, IEX2 terminals
	<b>MC-230-04</b>	230 VAC, 11 IO, 2 × RS232, isolated RS485, IEX2 terminals
Mounting:	DIN rail (35mm), 6M, 106mm	
Dimensions:	106x108x58mm	

## Features

- 3 digital inputs
- 4 relay outputs 8 A
- 4 universal inputs/outputs
- Ethernet, USB, IEX-2, 2×RS232, 1×RS485 (optional isolated)
- Enocan gateway (optional)
- 230 VAC power supply

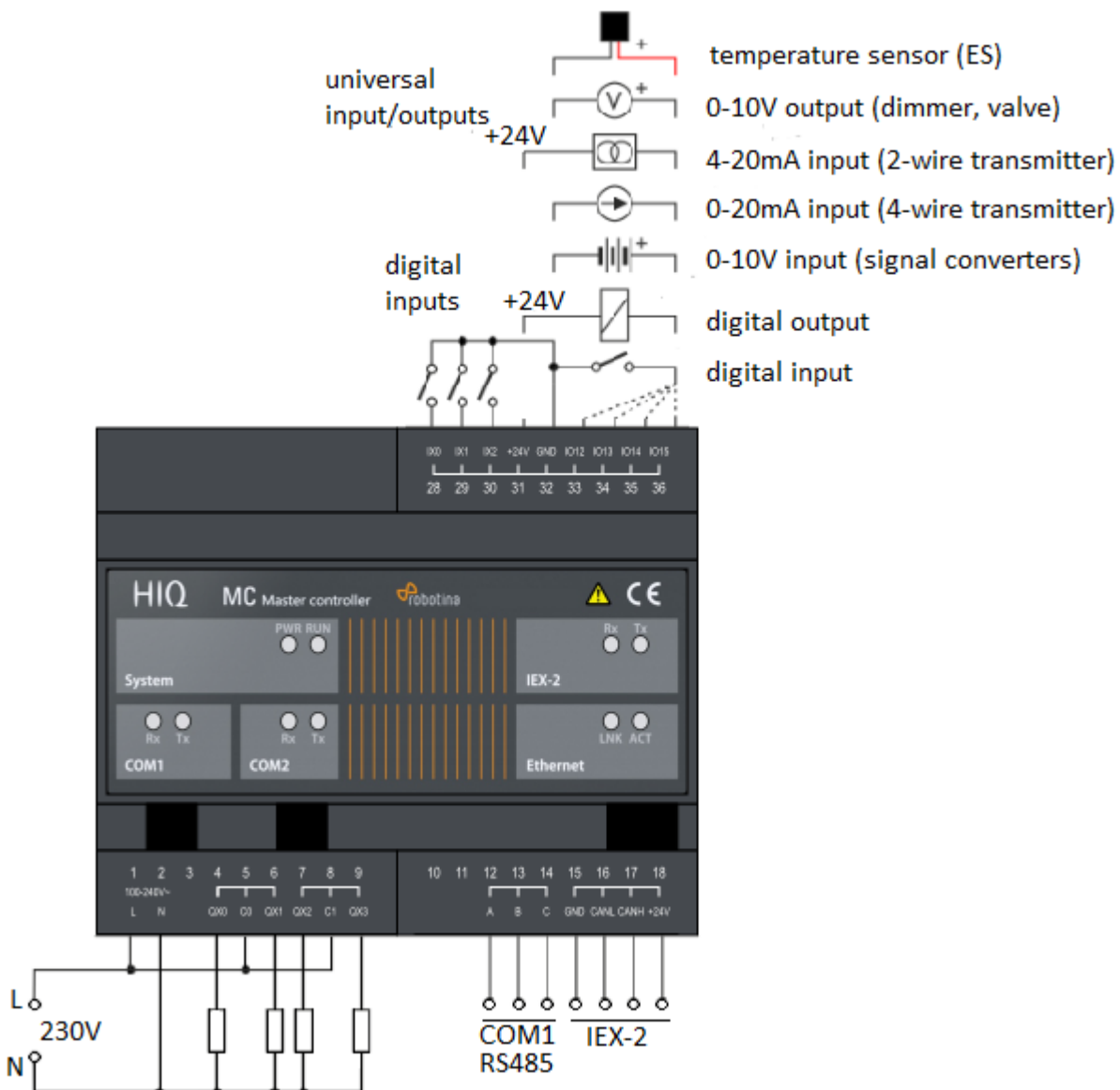
## Safety standards

EN 61010-1, EN 61010-2-201, EN 61131-2

# Technical specification

Relay outputs:	8A/250V AC, 8A/30V DC resistive
Communication:	Ethernet, 2x RS232, 1x RS485, IEX-2 bus
Nominal power rating:	230 VAC
Power consumption:	typ. 1W (no load), 10W max
Power output:	24V 200mA (IEX-2 + terminals)
Ingress protection:	IP20
Operating temperature:	0..50°C
Storage temperature:	-20..75°C
Relative humidity:	0..85% n/c
Input type(ix00..ix02):	dry contact, internal pull-up 12V 2mA
Cable lenght:	50m
COM1 type	RS485 two wire
Transmit/receive	automatic switching

# Terminals



# Three phase power sensor, CT

## 3-phase power-sensor, current transformer



Model number:	<b>PM3-E-D-CT</b>
Connect to:	<b>MC-230</b> RS485 power sensor bus A - B
Mounting:	DIN rail, 1M, 18 mm
Dimensions:	65 × 72 × 94,5 mm
<b>Used for measuring power and energy of</b>	
✓	single/three-phase energy sources
✓	single/three-phase energy consumers

## Applications

- Digital multi-function power sensor for single/three phase networks

## Features

- DIN rail mounting with 3x 50A (or 1x 50A) current transformer
- Line voltage and THD% (total harmonic distortion) of all phases
- Line Frequency
- Currents, Current demands and current THD% of all phases
- Power, maximum power demand and power factor
- Active energy imported and exported
- Reactive energy imported and exported

## General description

The unit measures and displays the characteristics of three phase four wires(3p4w) supplies, including voltage, frequency, current, power, active and reactive energy, imported or exported. Energy is measured in terms of kWh, kVArh. Maximum demand current can be measured over preset periods of up to 60minutes. In order to measure energy, the unit requires voltage and current inputs in addition to the supply required to power the product. The requisite current input(s) are obtained via current transformers (CT). This power sensor can be configured to work with a wide range of CTs with 0.33V

output, giving the unit a wide range of operation. Built-in interfaces provide pulse and RS485 Modbus RTU outputs. Configuration is password protected. This power sensor can be powered from a separate auxiliary (AC or DC) supply. Alternatively, it can be powered from the monitored supply, where appropriate.

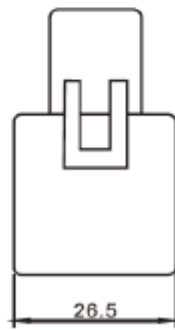
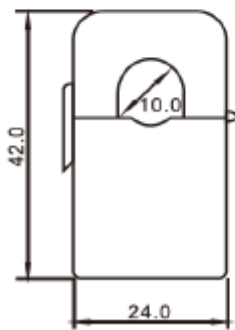
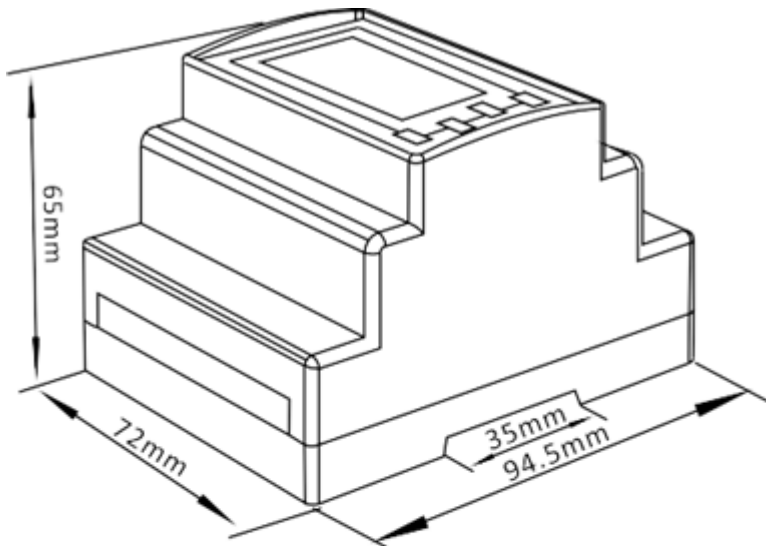
## Technical specifications

<b>Technical Data</b>	
Operating Humidity	≤ 75%
Storage Humidity	≤ 95%
Operating Temperature	-25°C - +50°C
Storage Temperature	-40°C - +70°C
Mounting	DIN rail (DIN 43880)
Sealing	IP51 Indoor
Auxiliary supply voltage	Nominal ± 1%
Auxiliary supply frequency	Nominal ± 1%
Frequency	50Hz or 60Hz(±2%)
Power Consumption	≤ 10W
<b>Accuracy</b>	
Voltage, Current	0.5%
Frequency	0.2% of Mid-Frequency
Power Factor	1% of Unity (0.01)
Active Power, Apparent Power	± 1% of Range Maximum
Reactive Power	± 1% of Range Maximum
Reactive Energy (Varh)	± 1% of Range Maximum
Active Energy (Wh)	Class 1 IEC 62053-21
<b>Current transformer</b>	
Frequency	50-60 Hz
Rated current	50 A
Accuracy	from 20% to 120% of rated current
Phase angle	less than 2 degrees at 50% of rated current
Insulation voltage	600 VAC
Maximum primary voltage	5000 VAC (insulated conductor)
Dielectric strength	2.5 kV/1mA/1min
Operating temperature	-15 to 60°C
Operating humidity	< 85 %
Case material	PC/UL94-V0
Bobin	PBT
Core	Permalloy
Internal structure	Epoxy
Leads	UL 1015, Twisted pair, 22 AWG
<b>Modbus</b>	
Bus Type	RS485 (Semi-Duplex)
Protocol	Modbus RTU
Baud Rate	1200/2400/4800/9600bps
Address Range	1-247



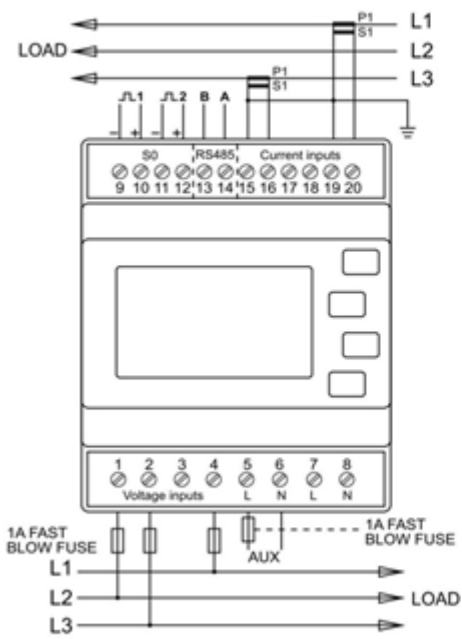
Max. Bus Loading	64pcs
Communication Distance	1000 Meters
Parity	EVEN/ODD/NONE
Data Bit	8
Stop Bit	1

## Dimensions

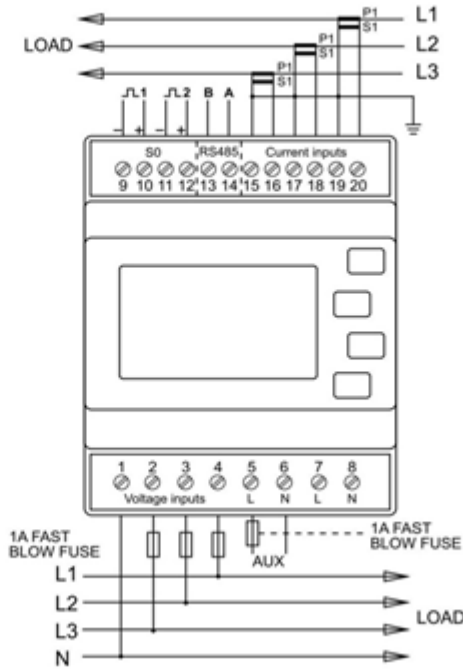


## Installation

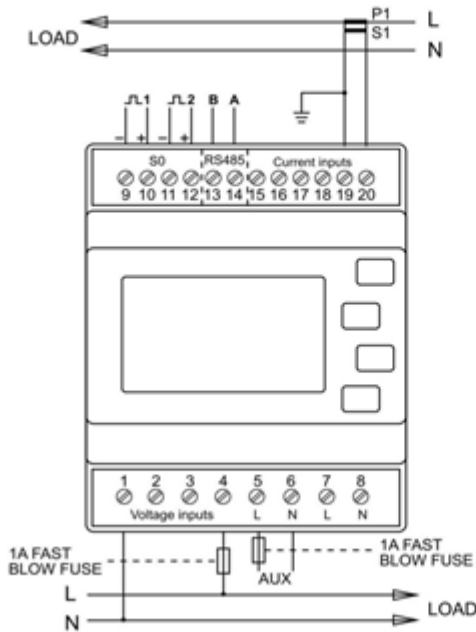
Three phase three wires



Three phase four wires



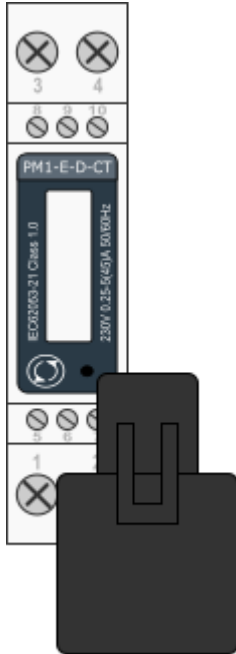
Single phase two wires



hiq\_pm3-e-d-ct\_user\_manual\_v1.pdf  
hiq\_pm3-e-d-ct\_protocol\_v1.6.pdf

# Single phase power-sensor, CT

## 1-phase power-sensor, current transformer



Model number:	<b>PM1-E-D-CT</b>
Connect to:	<b>MC-230</b>
	RS485 power sensor bus A - B
Mounting:	DIN rail, 1M, 18 mm
Dimensions:	18 × 62 × 119 mm
<b>Used for measuring power and energy of</b>	
✓	single-phase energy sources
✓	single-phase energy consumers

## Applications

- Digital multi-function power sensor for single phase networks

## Features

- DIN rail mounting with 50A current transformer
- Compact design in a single module 18mm wide
- Seal-able cover(phase and neutral terminals)

## General description

The PM1-E-D series is an advanced single phase energy monitoring solution with built-in configuration push button and LCD data displaying, particularly indicated for active energy and other parameters metering and for cost allocation. Housing for DIN-rail mounting, IP51 protection degree.

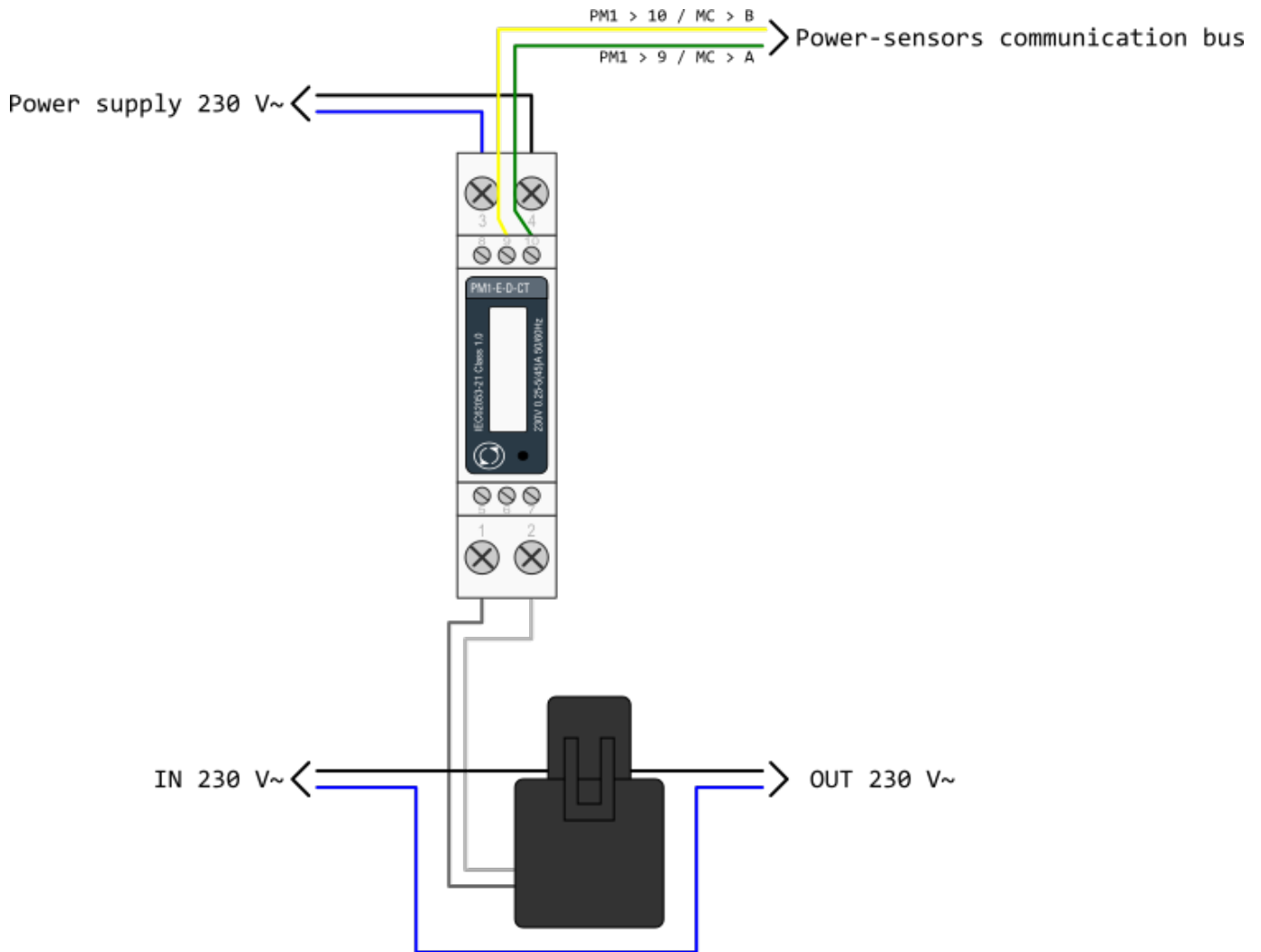
## Technical specifications

Technical Data	
Operating Humidity	≤ 75%

Storage Humidity	≤ 95%
Operating Temperature	-20°C - +50°C
Storage Temperature	-30°C - +70°C
International Standard	IEC 62053-21
Accuracy	Class 1
Mounting	DIN rail (DIN 43880)
Sealing	IP51 Indoor
Nominal Voltage Input	(Ph+N) 230V AC (176-276V AC)
Max Continuous Voltage	120% of nominal
AC Voltage Withstand	4KV for 1 minute
Impulse Voltage Withstand	6KV-1.2μS
Current Input	0.25-5A(6)A AC RMS
Operational Current Range	0.4% Ib-I <sub>max</sub>
Over current withstand	20I <sub>max</sub> for 0.01s
Nominal Input Current Burden	0.5VA
Frequency	50Hz(±10%)
Power Consumption	≤ 2W/10VA/phase
<b>Accuracy</b>	
Voltage, Current	0.5%
Frequency	0.2% of Mid-Frequency
Power Factor	1% of Unity (0.01)
Active Power, Apparent Power	≤ 1% of Range Maximum
Reactive Power	≤ 1% of Range Maximum
Reactive Energy (Varh)	Class 2
Active Energy (Wh)	Class 1
<b>Current transformer</b>	
Frequency	50-60 Hz
Rated current	50 A
Accuracy	from 20% to 120% of rated current
Phase angle	less than 2 degrees at 50% of rated current
Insulation voltage	600 VAC
Maximum primary voltage	5000 VAC (insulated conductor)
Dielectric strength	2.5 kV/1mA/1min
Operating temperature	-15 to 60°C
Operating humidity	< 85 %
Case material	PC/UL94-V0
Bobin	PBT
Core	Permalloy
Internal structure	Epoxy
Leads	UL 1015, Twisted pair, 22 AWG
<b>Modbus</b>	
Bus Type	RS485 (Semi-Duplex)
Protocol	Modbus RTU
Baud Rate	1200/2400/4800/9600bps
Address Range	1-247
Max. Bus Loading	64pcs

Communication Distance	1000 Meters
Parity	EVEN/ODD/NONE
Data Bit	8
Stop Bit	1

### PM1-E-D-CT Terminals



hiq\_pm1-e-d-ct\_user\_manual\_2020\_v1.0.pdf  
hiq\_pm1-e-d-ct\_protocol\_v1.2.pdf

# Smart plug

## Enocean wireless smart plug



Model number:	<b>SCO-WE-F - Schuko (German)</b> <b>SCO-WE-E - Type E (French)</b>
Mounting:	In-field; power outlet
Dimensions:	104 × 51 × 36mm
Connection:	Wireless Enocean
	<a href="#">MC-230-01</a>
	<a href="#">MC-230-03</a>
	<a href="#">MC-24-01</a>
	<a href="#">MC-24-03</a>
	<a href="#">MC-24-05</a>

- Smart Actuator
- High power capacity
- Ergonomy

## Technical specifications

Power:	230V AC 50Hz (EU) / 110V AC 60Hz (US)
Max switching capacity:	3.000W (Continuous)
	3.680W (Temporary) on resistive load
Self consumption:	< 1W
EEP (EnOcean Profile):	EEP D2-01-0A
Range:	Up to 30m indoor
Wireless repeater:	Yes
Dimension:	104 × 51 × 36mm

## Certifications and standards

### Europe

- EN61058-1 :2002+A2 :2008
- NF C 61-314 :2008+A1 :2010 (Type E)
- DIN VDE 0620 -1: 2013 (Schuko)
- DIN VDE 0620 -2-1: 2013 (Schuko)
- EN301489-1 V1.9.2
- EN301489-3 V1.6.1
- EN300220-2 V2.4.1

# Micro smart plug

## Enocean wireless micro smart plug with metering



Model number:	<b>SMM-WE-F - Schuko (German)</b> <b>SMM-WE-E - Type E (French)</b>
Mounting:	In-field; power outlet
Dimensions:	41 × 73 mm
Connection:	Wireless EnOcean <a href="#">MC-230-01</a> <a href="#">MC-230-03</a> <a href="#">MC-24-01</a> <a href="#">MC-24-03</a> <a href="#">MC-24-05</a>

- Smart Actuator
- Metering
- High power capacity
- Ergonomic



## Technical specifications

Power:	230V AC 50Hz (EU)
Max switching capacity:	1.840 W on resistive load
Metering	power [W] and energy [Wh]
Self consumption:	< 1W
EEP (EnOcean Profile):	EEP D2-01-0E
Range:	Up to 30m indoor
Wireless repeater:	Yes
Dimension:	41 × 73 mm

## Certifications and standards

### Europe

- EN61058-1 :2002+A2 :2008
- NF C 61-314 :2008+A1 :2010 (Type E)
- DIN VDE 0620 -1: 2013 (Schuko)
- DIN VDE 0620 -2-1: 2013 (Schuko)
- EN301489-1 V1.9.2
- EN301489-3 V1.6.1
- EN300220-2 V2.4.1

# Temperature and humidity sensor

## Enocean wireless temperature and humidity sensor



Model number:	<b>TSH-WE-W1</b>
Mounting:	In-field; on wall
Dimensions:	80 × 26 × 18 mm
Connection:	Wireless Enocean to <a href="#">MC-230-01</a>

- No battery
- Wireless
- Easy to mount
- Discreet
- Optional battery

## Technical specifications

Power:	Solar panel
- optional:	battery CR1216, 3 years
Metering	0 to 40°C (0.16°resolution)
	0 to 100% RH - Indoor use
Self consumption:	< 1W
EEP (EnOcean Profile):	EEP - A5-04-01
Range:	Up to 30m indoor
Dimension:	80 × 26 × 18 mm

## Certifications and standards

### Europe

- EN 60950-1: 2006+A11:2009
- +A1:2010+A12:2011+A2:2013
- EN301489-3 V1.6.1
- EN 61000-3-2:2013,
- EN 61000-3-3:2013
- EN 300220-2 V3.1.1
- EN 62479:2010

### USA

- FCC & IC Rules

# Relay Switch

## Wireless relay switch, 1 channel



Model number:	<b>RS1-WE-F1</b>
Mounting:	In-field; flush box
Dimensions:	40 x 44 x 16.9 mm
Connection:	Wireless Enocean
	<a href="#">MC-230-01</a>
	<a href="#">MC-230-03</a>
	<a href="#">MC-24-01</a>
	<a href="#">MC-24-03</a>
	<a href="#">MC-24-06</a>

- High switching capacity
- Ultra low profile
- Potential-free input
- Remote commissioning

## Technical specifications

Power supply:	230 V AC ~ 50 Hz
Switching capabilities:	230 V AC - 10A / 30 V DC - 10 A
Consumption:	<1W
Maximum output power:	2,3 kW (resistive load)
Radio frequency range:	868,0 to 868,6 MHz
RF power max:	+3dBm
Range:	Up to 30m indoor
Wireless repeater:	Yes
Operational temperature:	0°C to 40°
Protection rating:	IP 2X
Pairing:	up to 22 controllers
EEP (EnOcean Profile):	D2-01-0F
Dimensions :	40 x 44 x 16.9 mm

## Certifications and standards





### Europe

- EN60669-1:1999+A1:02+A2:08
- EN60669-2-1:2004+A1:09+A12:10
- EN300220-2 V3.1.1
- EN301489-01 V2.1.1
- EN301489-03 V2.1.1
- EN62479:2010

rs1-we-f1\_user\_manual.pdf

# Temperature sensor

## Digital temperature sensor

Technical specifications	
Operating temperature range	-55°C to +100°C (0°C to +50°C for -W)
Measuring error	max. ±2°C (-55°C to +100°C)
	max. ±0.5°C (-10°C to +85°C)
	typ. ±0.2°C (-10°C to +85°C)
Connect to	<a href="#">MC-230</a>
	terminals GND - IO12
	for ES-B connect red and black to GND and yellow to IO12
Order code	
<b>ES</b>	heat-shrink tubing, 2m wire
	
<b>ES-A</b>	aluminum housing IP 67, 5m wire
	
<b>ES-W-OW-WHITE</b>	white plastic housing, terminals
<b>ES-W-OW-IVORY</b>	ivory plastic housing, terminals
	
<b>ES-B</b>	steel tube housing IP 67, 2m wire
	

# Commissioning

## Mounting

Mount the main controller MC-230, PM1-E-D, PM3-E-D and PM3-I-D electricity sensors, fuses, power relays and push-buttons to a suitable location.

## Wiring

Wire all elements **except** communication with single-phase **PM1-E-D sensors**.

Connect the MC-230 to the home LAN.

## Configuration

Install and run [HEMS Configurator](#) on your PC.

Go to the “**settings**” page.

With the “**autodetect**” button, the application will locate the controller in the local network.

Enter **names**, select **icons** for all sources and consumers.

### Power-sensor adding

#### One-phase sensor PM1-E-D

- **Connect** communication bus (to only one power-sensor)
- In HEMS Configurator counter should appear as “new device”
- Press and hold the push-button on the power-sensor until it appears **-Set-** on display
- In HEMS Configurator click on the “**add**” button next to the source or consumer that the sensor is measuring

#### Three-phase sensor PM3-E-D

- **Connect** communication bus (to only one power-sensor)
- In HEMS Configurator counter should appear as “new device”
- Click on the “**add**” button next to the source or consumer that the sensor is measuring

#### Three-phase sensor PM3-I-D

- Communication bus with the power-sensor should already be connected
- Press and hold the push-button on the sensor until it appears **“CONf Add”** on display
- In HEMS Configurator counter should appear as “new device”
- Click on the **“add”** button next to the device that the sensor is measuring

## Power-sensor removing

### One-phase sensors PM1-E-D

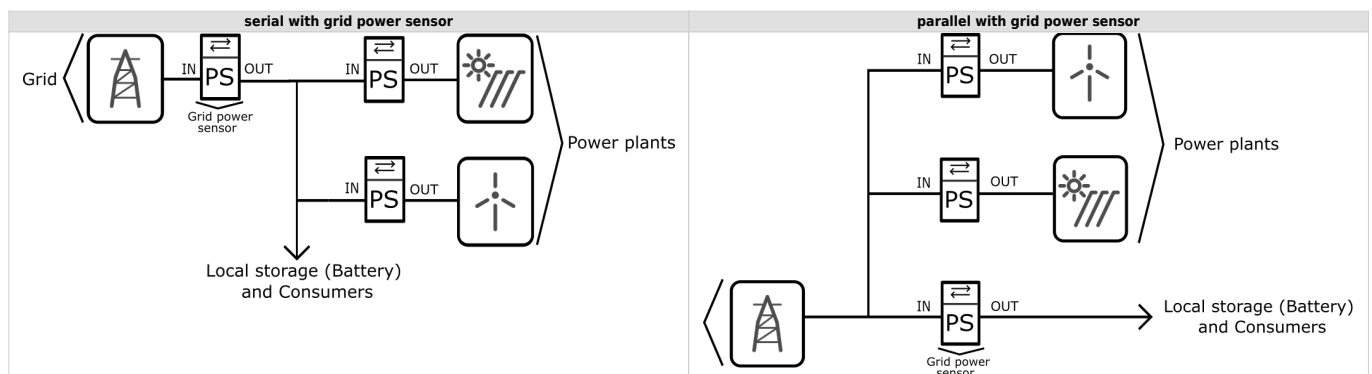
- Make sure the “new device” is empty
- Press the button on power-sensor until **-Set-** appears on display
- In HEMS Configurator press **“del”** button next to the sensor
- After a few seconds, the sensor should appear as the “new device”
- If desired, the sensor can be removed or it can be assigned to another device

### Three-phase power-sensor

- Make sure the “new device” is empty
- In HEMS Configurator press **“del”** button next to the sensor
- After a few seconds, the sensor should will appear as the “new device”
- If desired, the sensor can be removed or it can be assigned to another device

## Power plant connection<sup>1</sup>

The power plant can be connected to the grid in two ways:



When configuring the power plant, select

- in:serial with grid power sensor
- ex:parallel with grid power sensor

By default, the power plant is connected in series.

## Wireless setting

Enable wireless setting to add, delete or set repeater level wireless modules.



## Wireless module adding

### Micro smart plug and Smart plug

- Launch the pairing by press on the button during 2 seconds until the LED becomes red. Release the button, the LED will then glow in red
- To confirm that the pairing is OK, the LED will blink in green
- In the HEMS Configurator module should appear as “new device”
- Click on the **“add”** button next to the consumer that connected to the module

### Relay switch-1 channel

- Launch the pairing by doing 3 consecutive presses on the relay switch button. The LED blinks red
- To confirm that the pairing is OK, the LED will blink green twice
- The HEMS Configurator module should appear as a “new device”
- Click on the **“add”** button next to the consumer that connected to the module

### Relay switch-2 channel

- Launch the pairing by doing 3 consecutive presses on the relay switch button. The LED blinks red
- To confirm that the pairing is OK, the LED will blink green twice
- In the HEMS Configurator the module first channel should appear as a “new device”
- Click on the **“add”** button next to the consumer that connected to the module first channel
- In the HEMS Configurator the module second channel should appear as a “new device”
- Click on the **“add”** button next to the consumer that connected to the module second channel
- Before you pair a new device both channels must be added to the consumers

## Wireless module removing

### Micro smart plug, smart plug and relay switch-1 channel

- In HEMS Configurator press **“del”** button next to the consumer connected to the module you want to removing
- After a few seconds, the module is removing

### Relay switch-2 channel

- In HEMS Configurator press **“del”** button next to the consumer connected to the channel module you want to removing
- After a few seconds, delete the channel of module should appear as the “new device”
- If desired, the module can be removing if delete another channel or the deleted channel can be assigned to another consumer

## Setting repeater level

When enable repeater mode, wireless module can repeater a message not addressed to him, and increase range by creating network gride between all wireless devices.

The repeater mode has 3 levels:

- **Level 0:** repeater mode is deactivated.
- **Level 1:** the signal is repeated once.
- **Level 2:** the signal is repeated twice.

By default the repeater mode is disabled.

## Setting device management features

For each managed consumer we can set:

- **man. time:** the time is in minutes for the manual override. It serves to ensure that the user can ensure a minimum validity of the manual switchover.
- **out mode:** it can be normal (the output is turned on means the device is working) or inverted (the device is working when the output is off).
- **timetable checkbox:** allows to enable or disable the timetable for each device.

## Enable power-sensor from compatible systems

HEMS will automatically detect compatible

- battery systems eStore and
- home automation systems HIQ Home

which are in the same local network.

Only the first system is detected, if there are more than one it is necessary to enter the serial number of the desired system manually.

if **eStore** is **enabled**, HEMS will read:

- **grid** power-sensor
- power-sensor for the **first PV Plant** and
- power-sensor of the **first storage** system

From the **enabled HIQ Home** system, HEMS will automatically read the **grid** power-sensor.

## Internet access

If enabled, the system will automatically establish access to the HIQ Universe web service. Communication with the server is automatically established so that the controller sends the push message to the server, and the server can then access the controller on the given path. The UDP type

of internet packets on the output port 8442 is used. If communication is not established automatically, check the access from the local network to the Internet and the router settings.

## **Permanent memory**

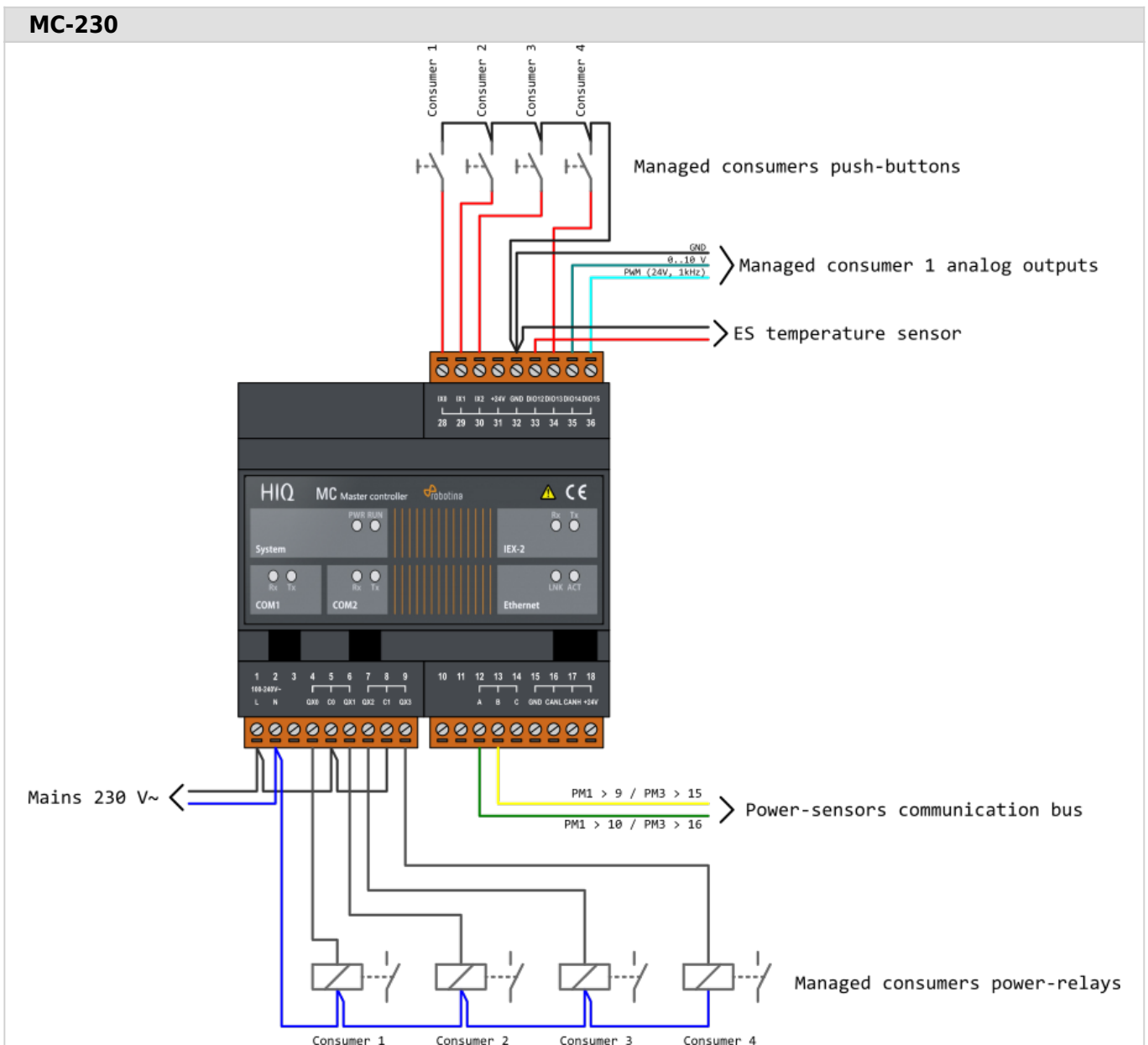
Saving parameters to the permanent memory, after changing the settings, it is necessary since at startup HEMS always reads parameters from the permanent memory.

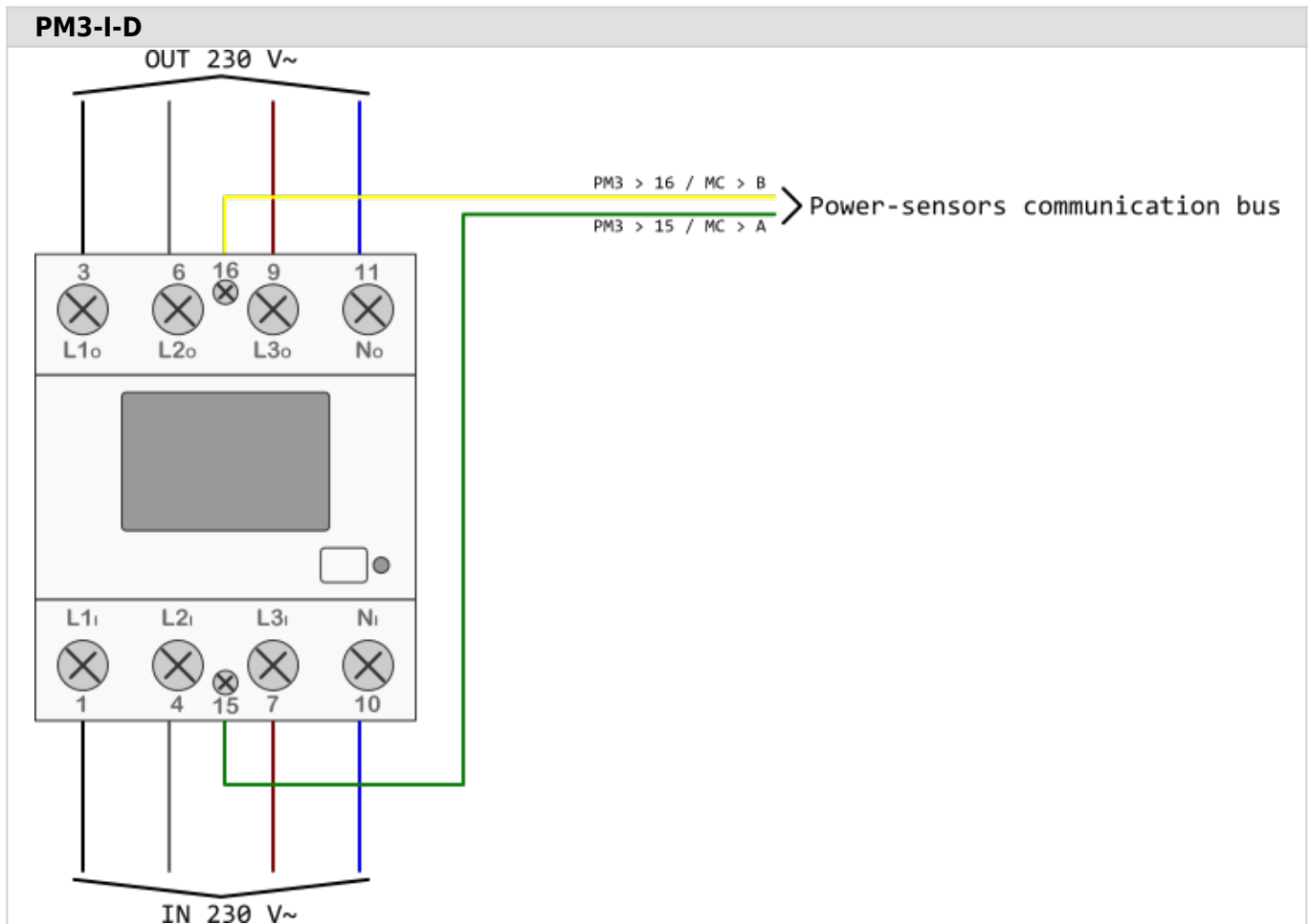
## **Backup / restore to PC**

HEMS Configurator allows you to backup and restore all parameters to pc.

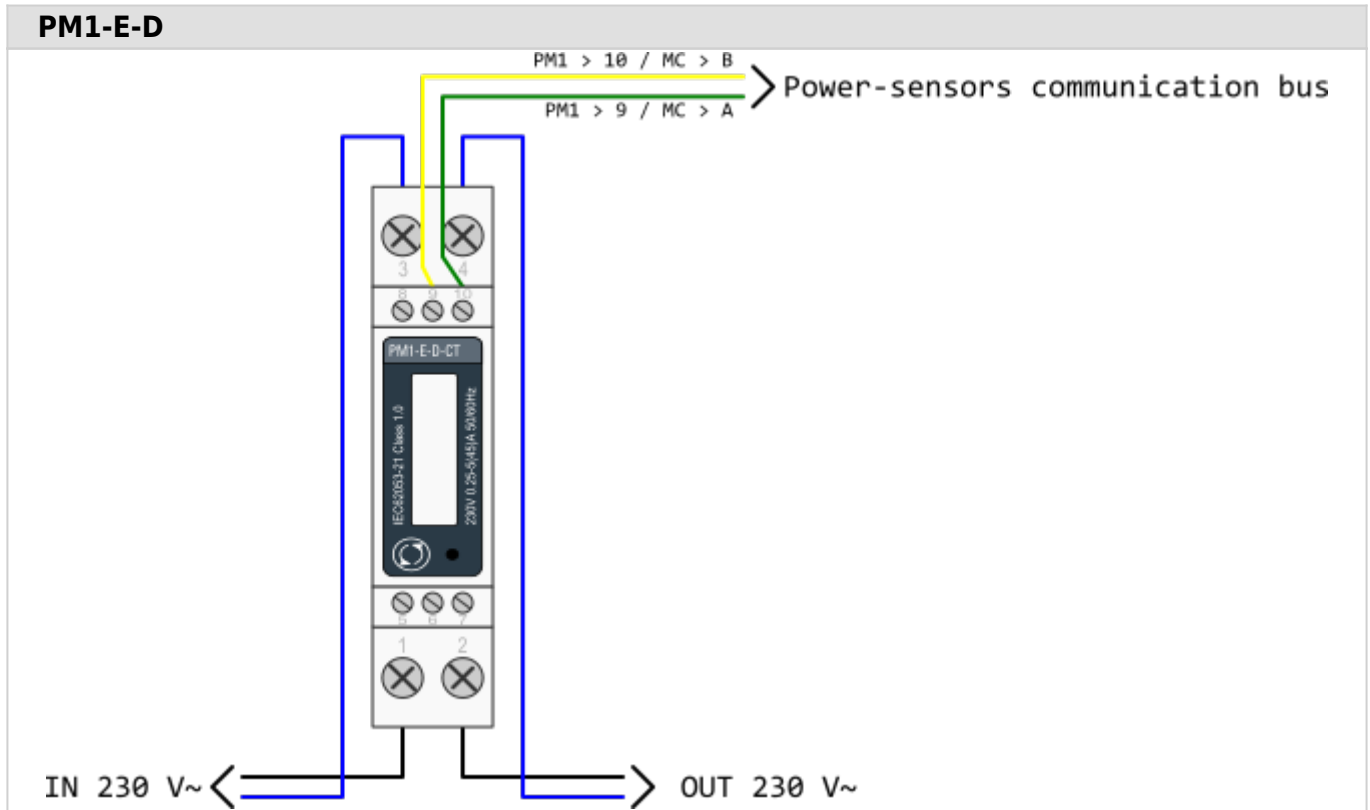
<sup>1</sup> Only for the first power plant

# HEMS G2 wiring

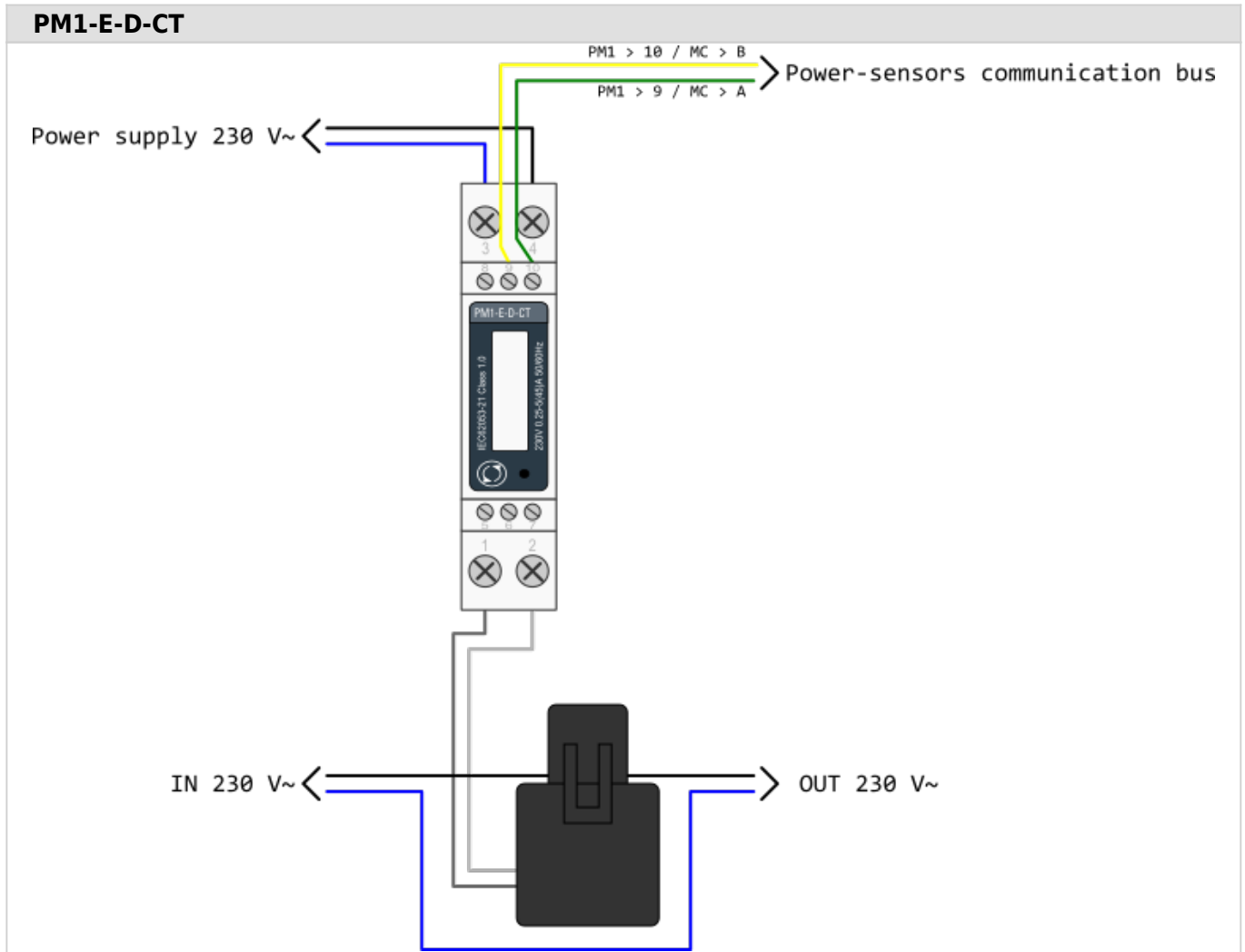




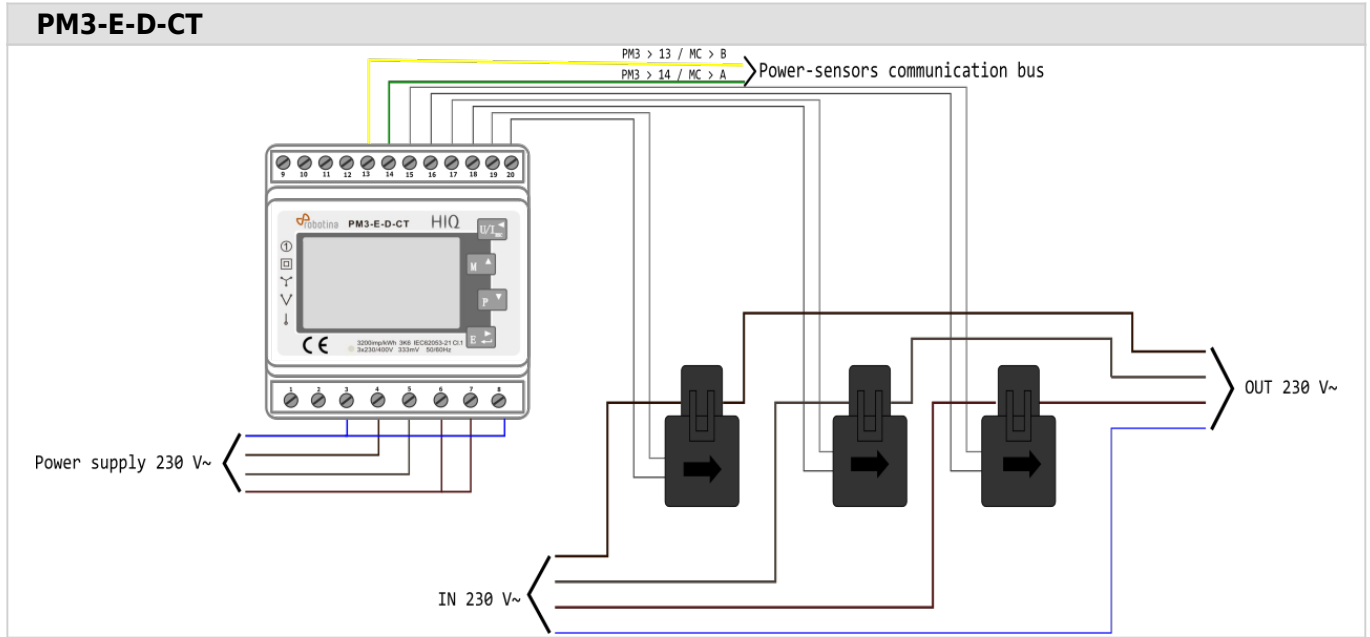
**PM1-E-D**



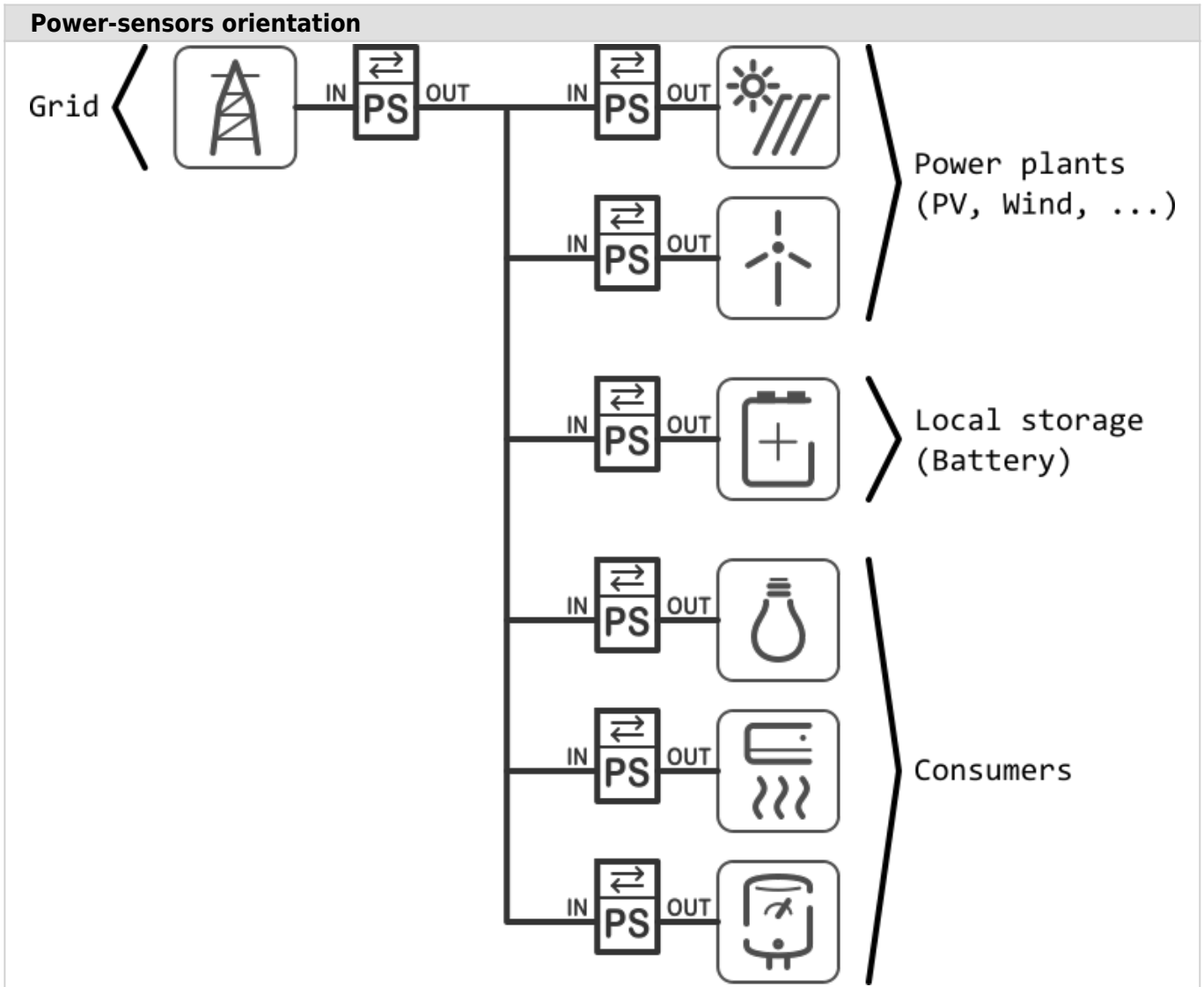
**PM1-E-D-CT**



### PM3-E-D-CT







# HEMS G2 Configurator

## HEMS Configurator

### home

Basic system overview.



1. Grid		
>	From grid	Tariff (LO, HI, D-LO, D-HI) and power from grid in W Imported energy by tariff in Wh
<	To grid	Power exported to grid in W Exported energy in Wh
2. Plants		
<	Produced	Produced power in W and energy in Wh
>	Consumed	Consumed power in W and energy in Wh
3. Storage systems		
<	Sourced	Power in W and energy in Wh sourced from storage (battery)
>	Stored	Power in W and energy in Wh stored (to battery)
<b>bargraph and %<sup>1</sup></b>	SOC	Battery State Of Charge
4. Consumers		
>	Consumed	Consumed power in W and energy in Wh

<b>[]</b>	Status	Output status for managed consumers
<b>bargraph</b> <sup>2</sup>	Analog out	Analog output value
<b>click</b>	Toggle	Click in frame toggles managed consumers output
<b>long-press</b> <sup>2</sup>	Set analog	Long press on first consumer pops-up dialog for analog value set
<b>5. Unknown source</b>		
>	Sourced	Power in W and energy in Wh from unknown source
⚠ Accumulate also all differences caused by power-sensor inaccuracy		
<b>6. Other consumers</b>		
>	Consumed	Consumed power in W and energy in Wh by other (not measured) consumers
<b>7. Temperature and humidity</b>		
	Temperature	Temperature in °C
	Humidity	Humidity in % RH

<sup>1</sup> only for eStore

<sup>2</sup> only for first managed consumer

# power

Overview of current power distribution by source / consumer.

The screenshot shows the HEMS Configurator v1.1.0 interface. The main content is a table with the following structure:

	grid lo	grid ht	grid o-lo	grid o-hi	Pv plant	battery	unknown source
	0	0	0	0	966	0	0
GRID SUM:	0				PLANT SUM: 966	STORAGE SUM: 0	0
TOTAL:	966						
Grid	766				766	0	0
Pv plant	0	0	0	0	0	0	0
Battery	0	0	0	0	0	0	0
Other consumers	200				200	0	0
Consumer 1	0	0	0	0	0	0	0
Consumer 2							
Consumer 3							
Consumer 4							
Consumer 5							
Consumer 6							
Consumer 7							
Consumer 8							

The interface also includes a sidebar with buttons: home, power [W], energy [Wh], timetable, tariff, settings, and exit. The status bar at the bottom left shows 'mon 15:39:12'.

## 1. Sourced power

Sourced power for each source

Sums per source type

Total of all sourced power

## 2. Consumed power

Power for each consumer

## 3. Power distribution

Partial distributed power

HEMS Configurator v1.1.0

	grid LO	grid HI	grid D-LO	grid D-HI	PV plant	battery	unknown source
	0	0	0	0	966	0	0
	GRID SUM:				0		0
					TOTAL:	966	0
grid	766				766	0	0
plant	0	0	0	0	0	0	0
Battery	0	0	0	0	0	0	0
Other consumers	200	0	0	0	200	0	0
Consumer 1	0	0	0	0	0	0	0
Consumer 2							
Consumer 3							
Consumer 4							
Consumer 5							
Consumer 6							
Consumer 7							
Consumer 8							

mon 15:39:12

- home
- power [W]
- energy [Wh]
- timetable
- tariff
- settings
- exit

**1. Sourced power distribution**

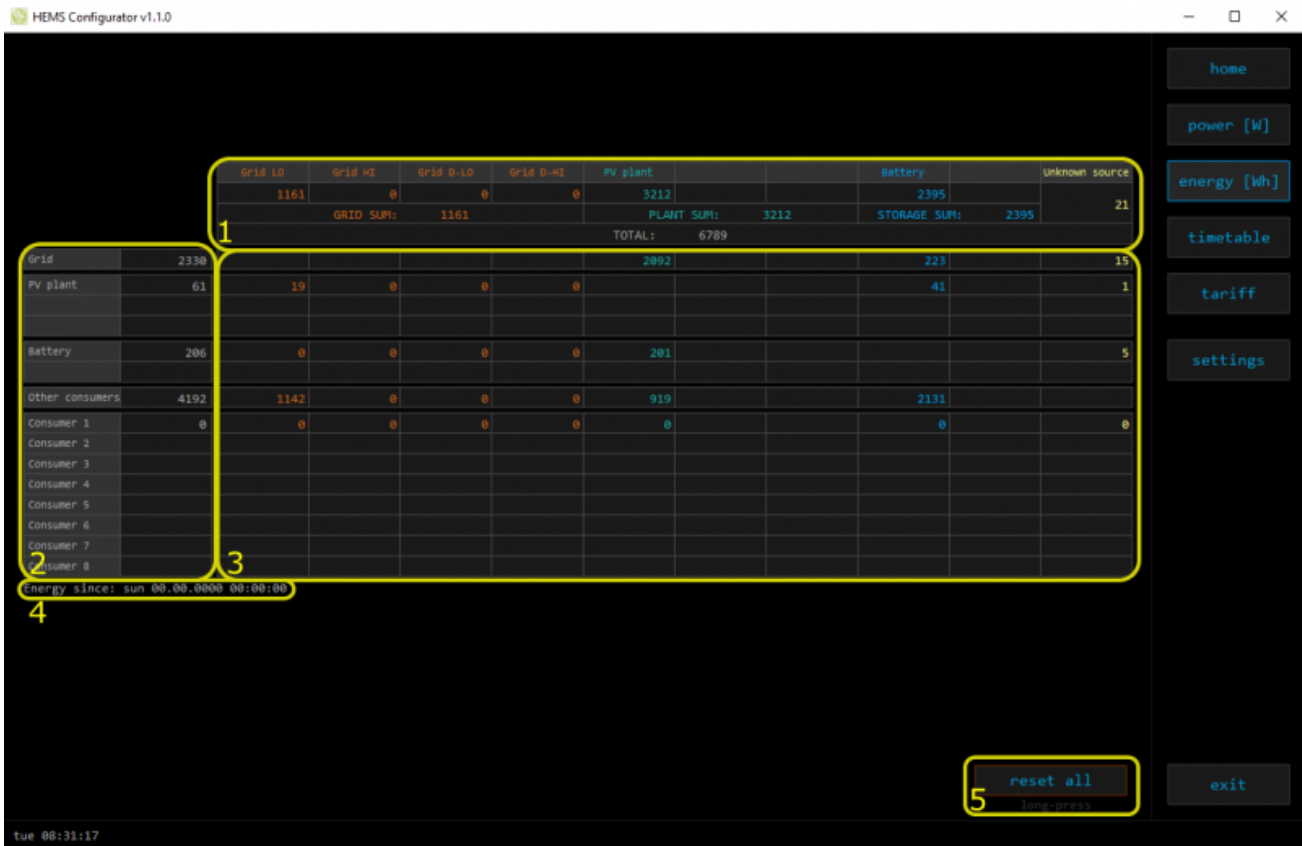
How sourced power is consumed by each consumer

**2. Consumed power distribution**

Who sources consumed power

# energy

Energy overview of a given time distributed by sources / consumers.



## 1. Sourced energy

Sourced energy for each source

Sums per source type

Total of all sourced energy

## 2. Consumed energy

Energy for each consumer

## 3. Energy distribution

Partial distributed energy

## 4. Energy since

Date and time since energy is recorded

## 5. Reset all

Long-press to reset all energy counters

# timetable

Weekly timetable for managed consumers.

The screenshot shows the HEMS Configurator v1.1.0 interface. At the top, there is a menu with tabs for Consumer 1 through Consumer 8. Below the menu, there is a 'timetable enable' checkbox. The main area is a weekly grid with 7 rows (mon-sun) and 24 columns (0-23). The grid contains various colored triangles representing events. Below the grid, there are several control panels: a panel for 'executed once' with buttons 'set off', 'set on', 'disable', and 'delete'; a panel for 'weekly recurring' with buttons 'set off', 'set on', and 'delete'; a panel for 'Analog out' with buttons 'set' and 'delete'; and a panel for 'cloud optimization' with checkboxes for 'once actions', 'recurring actions', and 'analog values'. There is also an 'exit' button on the right side.

## 1. Managed load menu

Switch between managed loads

## 2. Enable checkbox

When un-checked timetable is not executed

## 3. Events grid

Events displayed in weekly grid (15 min resolution)

Click to select time and set event by clicking buttons below

## 4. Once actions (top priority timetable actions)

Actions are executed and then automatically cleared.

“Disable” action will just disable recurring action.

## 5. Recurring actions (low priority actions)

Actions are executed each week.

## 6. Analog out

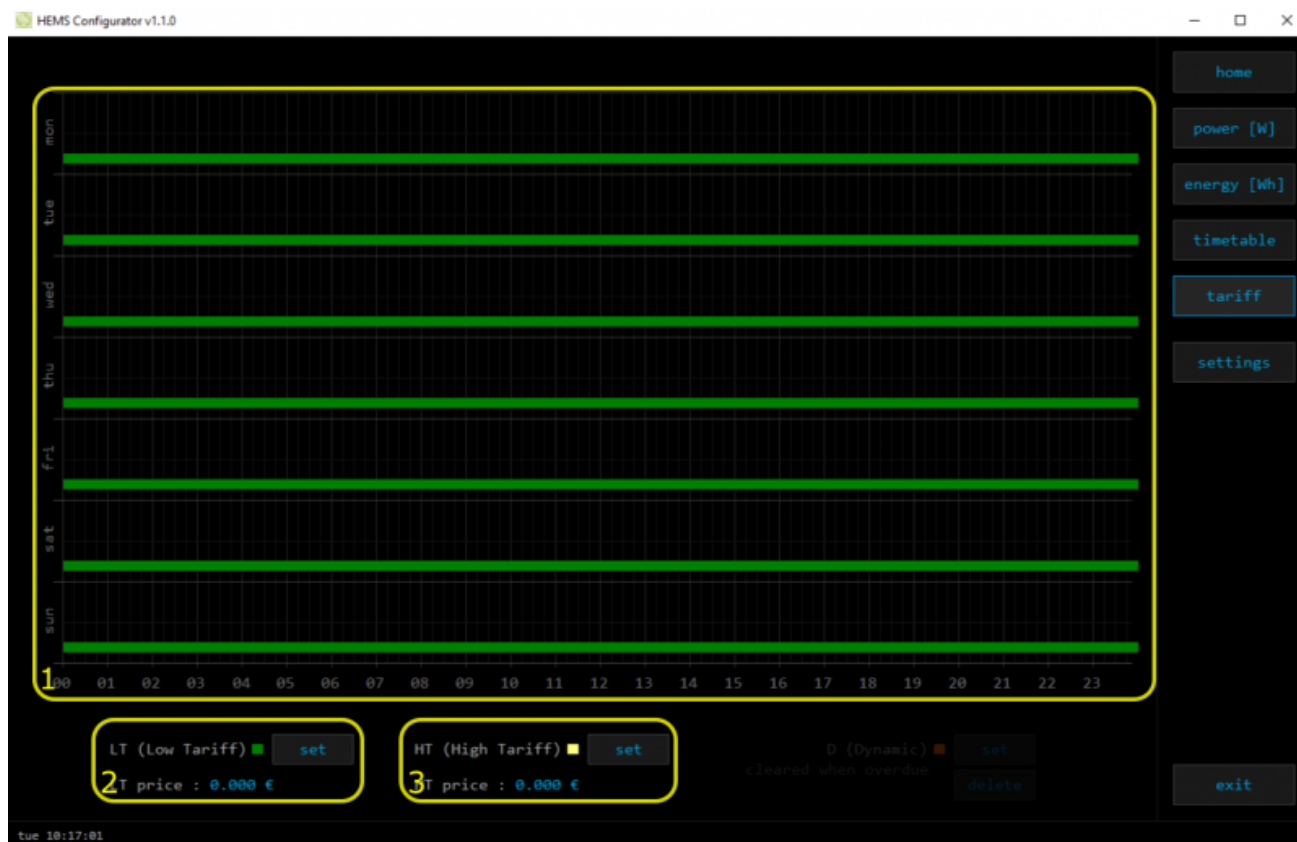
Action to set analog output. Analog actions are recurring.

## 7. Cloud optimization

When enabled (checked) cloud optimization is enabled.

# tariff

Weekly tariff timetable for grid energy per tariff distribution.



## 1. Tariff grid

Graphical weekly timetable with tariffs.

Click to select term, click-and-drag to select multiple terms.

## 2. Low tariff

Set low tariff for selected terms.

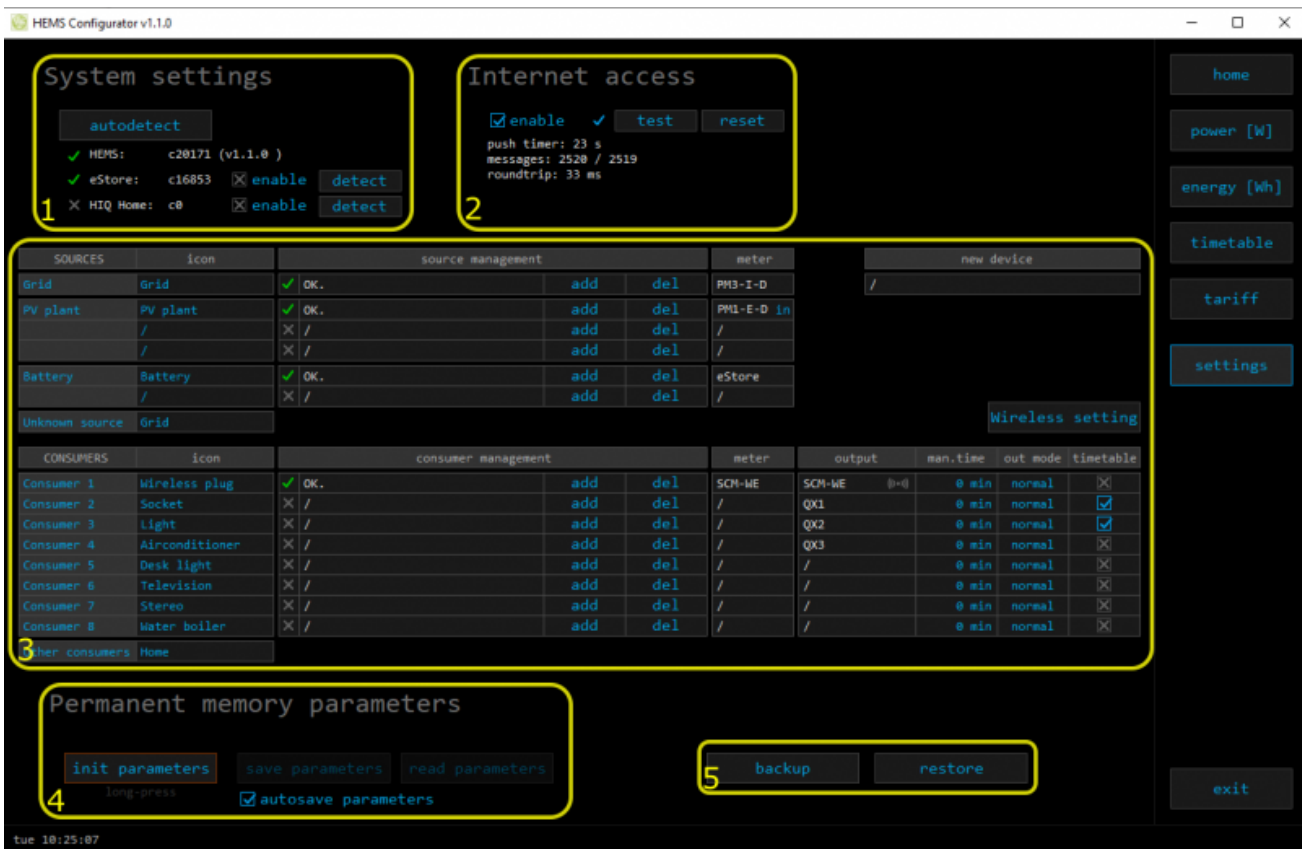
## 3. High tariff

Set high tariff for selected terms.



# settings

Easy and intuitive system setup.



1. System settings		
[ autodetect ]		Click to find HEMS G2 in local network
eStore	c.....	eStore serial number (automatically detected or can be entered manually).
	[ ] enable	When checked HEMS will read Grid, first plant and first Storage directly from eStore (so there is no need to duplicate power-sensor).
	[detect]	eStore address is cleared and new eStore can be detected.
HIQ Home	c.....	HIQ Home serial number (automatically detected or can be entered manually).
	[ ] enable	When checked HEMS will read Grid power and energy from HIQ Home (so there is no need to duplicate power-sensor).
	[detect]	HIQ Home address is cleared so new can be detected.
2. Internet access		
[ ] enable	When checked HEMS is automatically connected to HIQ Universe cloud service. Connection is initialized by HEMS system and uses UDP packets on port 8442.	
[test]	New "push" message is sent to server and roundtrip time is rechecked.	

[reset]	Clear messages counts and roundtrip time	
push timer	Timer in s for send "push" message to server	
messages	Sent "push" messages / responses counters	
roundtrip	Time in ms between sent push message and response.	
<b>3. Sources and Consumers settings table</b>		
SOURCES	Source name	
icon	Source icon	
source management	Source power-sensor management	
	message	Messages regarding source power-sensor
	add	Associate new power-sensor to source
	del	Disassociate power-sensor from source & configure it as new power-sensor
meter	Source power-sensor type	
	in/ex	Power plant connected <sup>1</sup>
new device	Power-sensor configured as new one detected or wireless module configuration <sup>2</sup>	
Wireless setting	Setting up wireless modules	
CONSUMERS	Consumer name	
icon	Consumer icon	
consumer management	Consumer meter and output management	
	message	Messages regarding consumer meter and output
	add	Associate new power-sensor or new wireless module <sup>2</sup> to consumer
	del	Disassociate power-sensor or wireless module <sup>2</sup> from consumer & configure it as new power-sensor or new wireless module <sup>2</sup>
meter	Consumer meter type	
output	Consumer output type	
	<<>>	Setting repeater level <sup>3</sup>
man. time	Manged consumer manual override timer	
out mode	Manged consumer output mode (normal or inverted)	
timetable	Manged consumer timetable execution enabled	
<b>4. Permanent memory parameters</b>		
[init parameters]	Init all parameters to default value	
[save parameters]	Save all parameters to permanent memory	
[read parameters]	Read all parameters from permanent memory	
[ ] autosave parameters	Parameters will be automatically saved to permanent memory in 15 minutes after last parameter change	
<b>5. Backup / Restore to PC</b>		
[backup]	Backup all parameters to PC	
[restore]	Restore all parameters from PC backup	

<sup>1</sup> only for the first power plant

<sup>2</sup> wireless setting must be enabled

<sup>3</sup> only for wireless modules

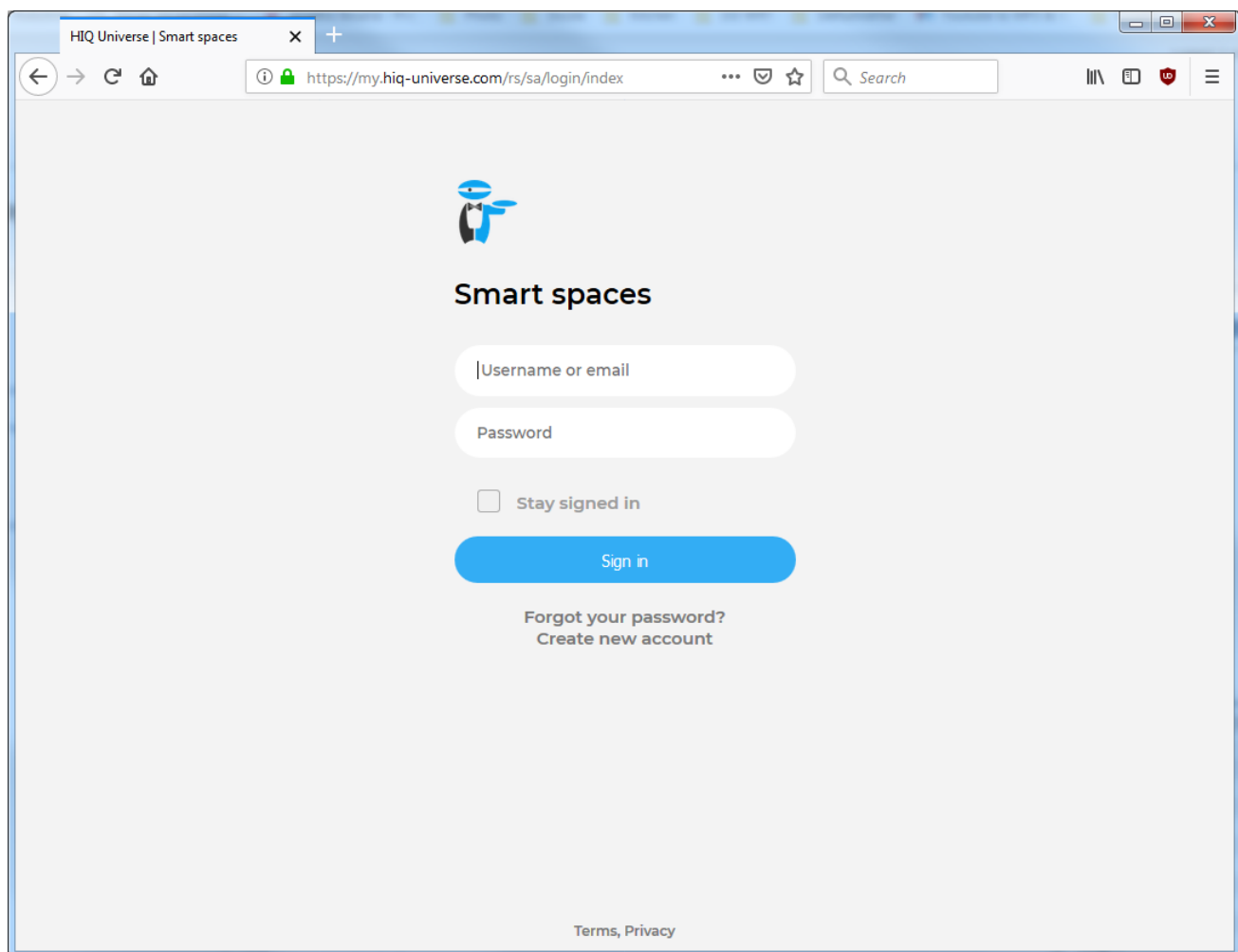
# HIQ UNIVERSE

HIQ Universe is a cloud service that enables:

- An overview of current power consumption and
- An overview of the history of electrical power and energy consumption and production.

Access point: <https://my.hiq-universe.com>

## HIQ Universe Log-in

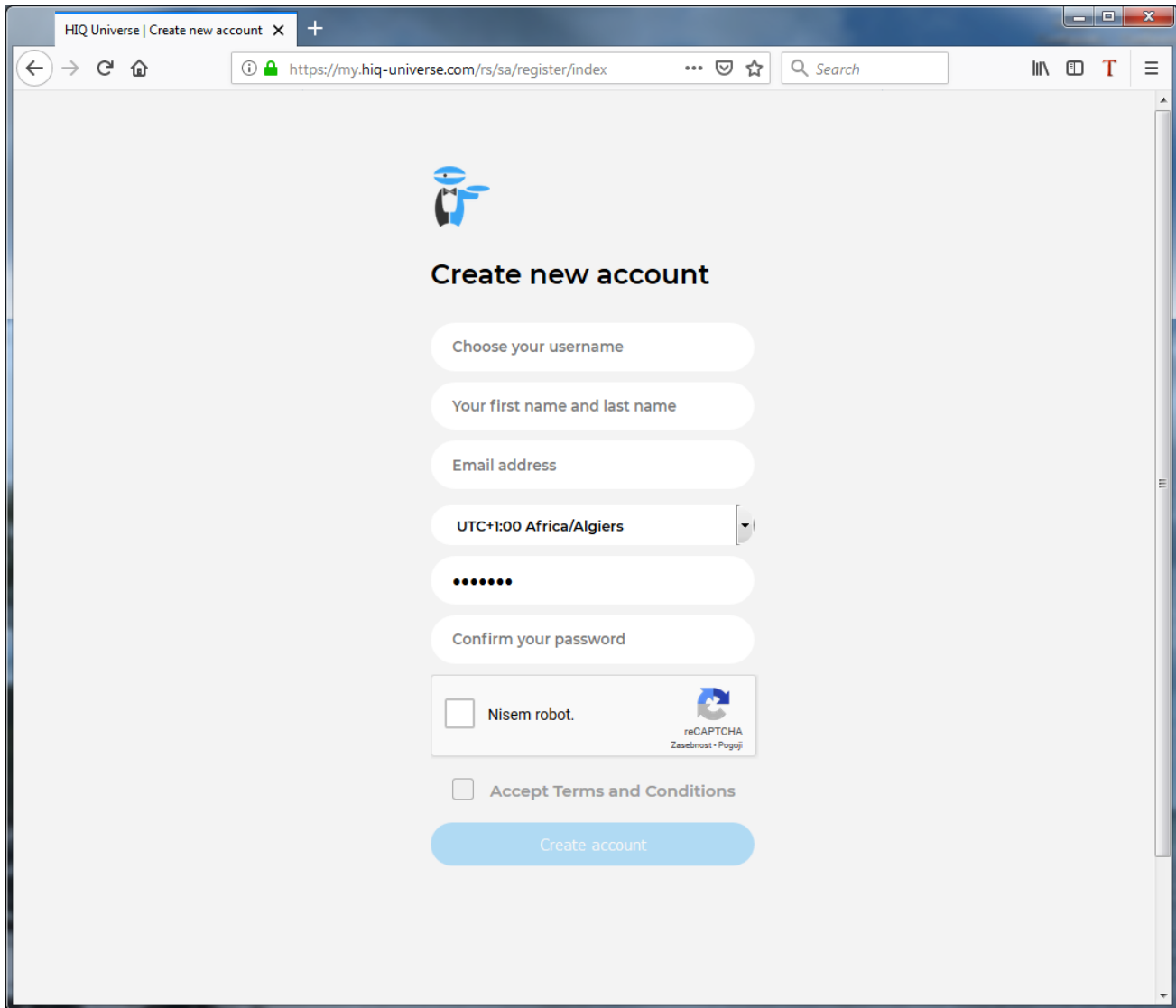


Log in with your username or email and password to see your [HIQ Universe subscription dashboard](#).

To reset forgotten password click on "[Forgot your password?](#)"

To create new account click on "[Create new account](#)".

## Create HIQ Universe account



In the appropriate fields, enter:

- Username
- First and Last name
- E-mail address
- Timezone
- Password

Click on "I'm not a robot"

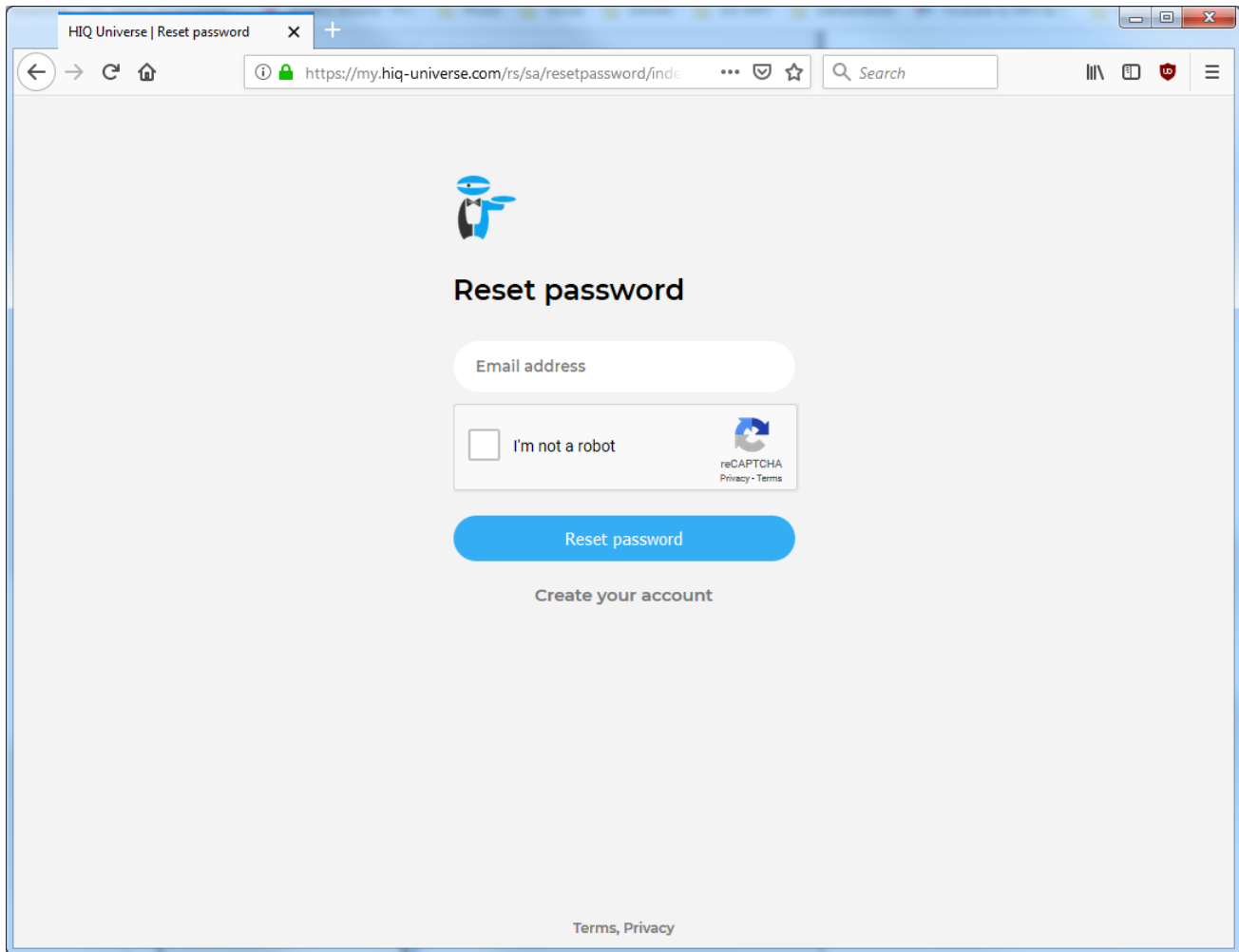
Accept Terms and Conditions.

Click on Create account.

A confirmation link will be sent to your email address.

Proceed to ["HIQ Universe Log-in"](#) screen.

## Reset forgotten password



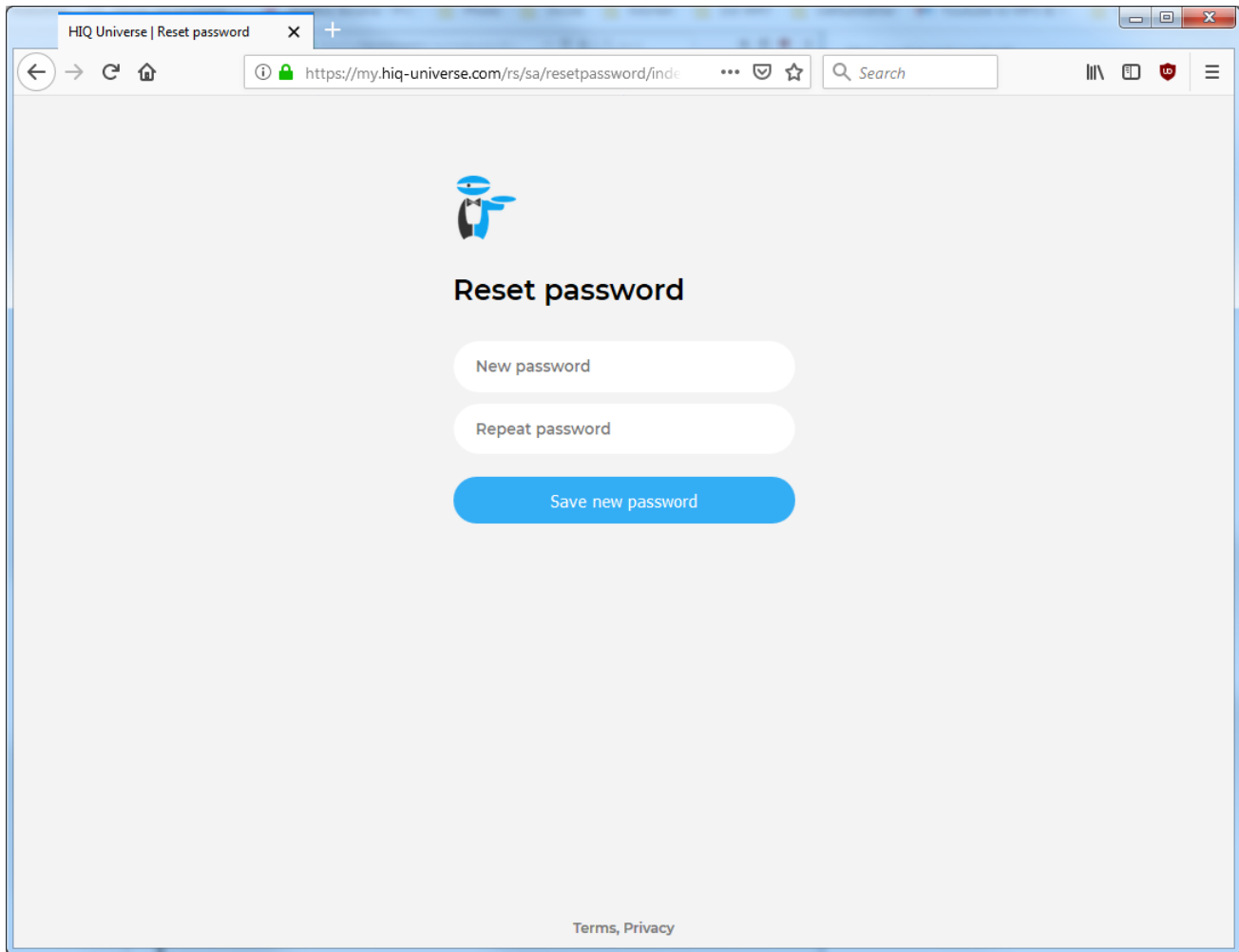
The screenshot shows a web browser window with the title "HIQ Universe | Reset password". The address bar displays "https://my.hiq-universe.com/rs/sa/resetpassword/index". The page features a blue robot icon at the top center, followed by the heading "Reset password". Below the heading is a white input field labeled "Email address". Underneath the input field is a checkbox labeled "I'm not a robot" next to a reCAPTCHA logo and the text "reCAPTCHA Privacy - Terms". A prominent blue button labeled "Reset password" is centered below the checkbox. At the bottom of the form area, there is a link that says "Create your account". At the very bottom of the page, there are links for "Terms, Privacy".

In the appropriate field, enter email address.

Click on "I'm not a robot"

Click on "Reset password".


You will receive email with password reset link.

A screenshot of a web browser window showing the "Reset password" page for HIQ Universe. The browser's address bar displays the URL "https://my.hiq-universe.com/rs/sa/resetpassword/index". The page features a blue robot-like logo at the top center. Below the logo, the heading "Reset password" is displayed. There are three input fields: "New password", "Repeat password", and a blue "Save new password" button. At the bottom of the page, there are links for "Terms, Privacy".

HIQ Universe | Reset password

https://my.hiq-universe.com/rs/sa/resetpassword/index

Search



## Reset password

New password

Repeat password

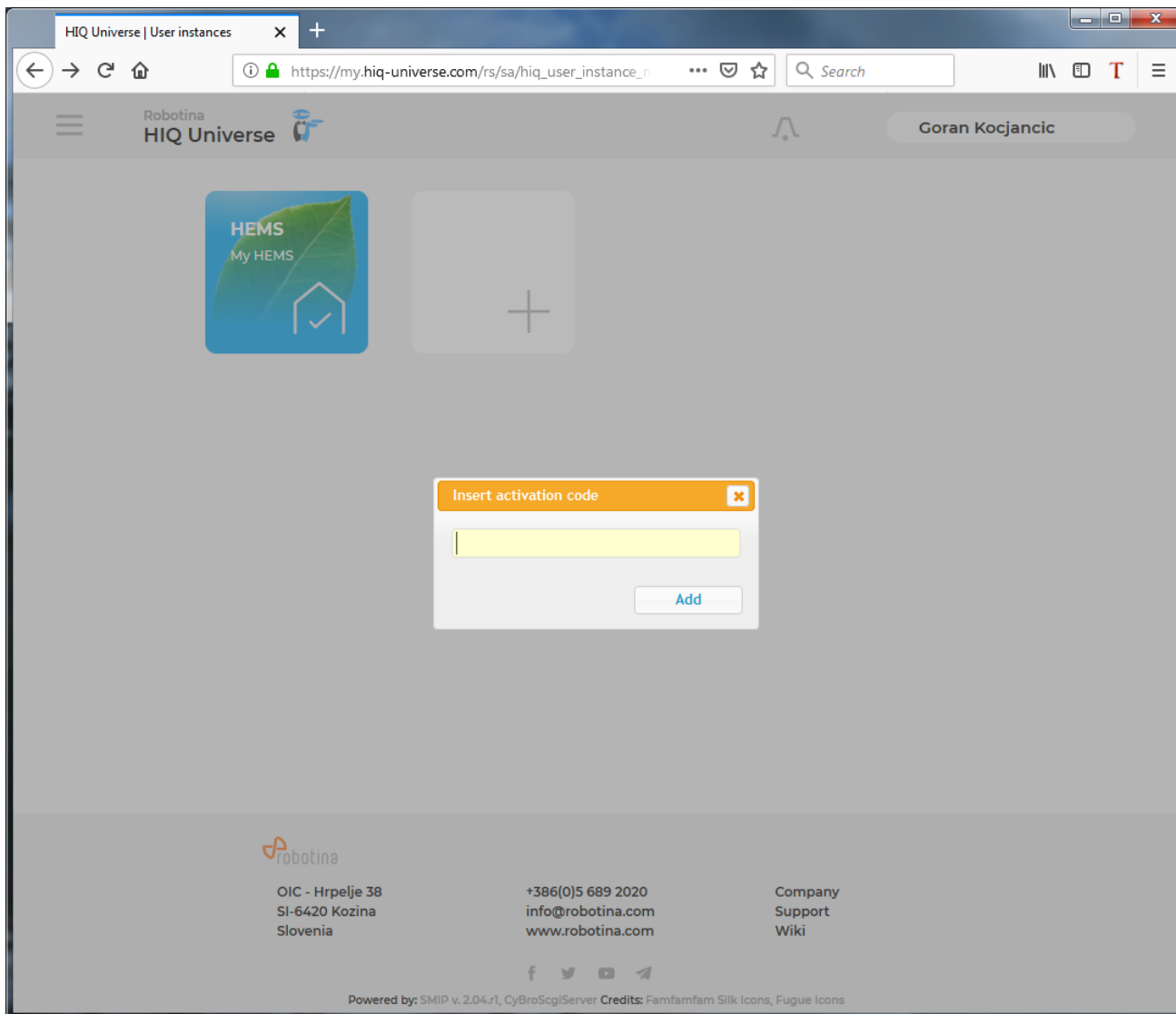
Save new password

[Terms, Privacy](#)

Enter new password and click on "Save new password".

Proceed to "[HIQ Universe Log-in](#)" screen.

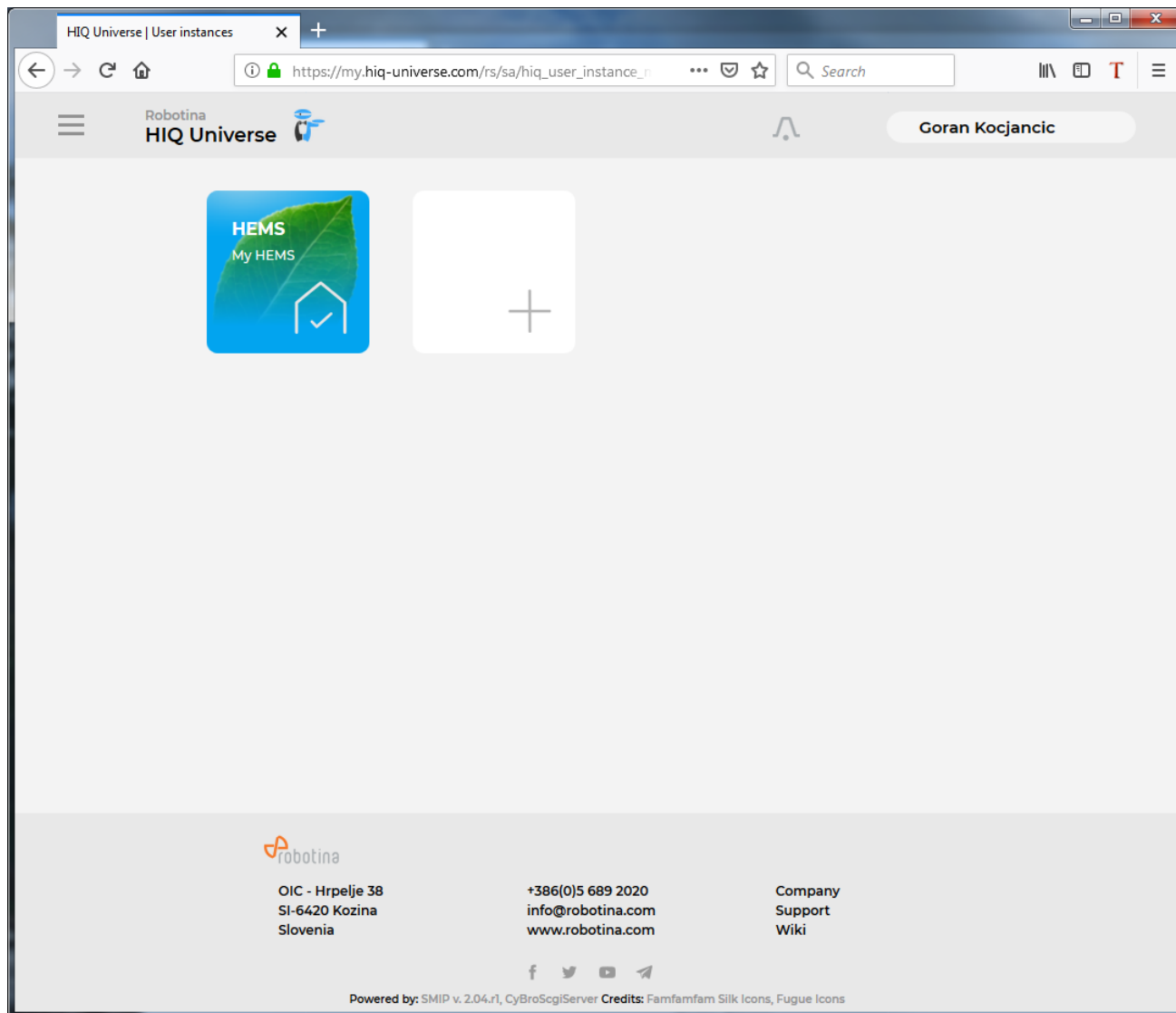
## Add HEMS controller



Enter HEMS activation code from “HEMS Quick Set-Up Guide” found in HEMS box.

A screenshot of the HIQ Universe registration form. It features a blue header with the text 'HIQ UNIVERSE' and the URL 'https://my.hiq-universe.com'. Below the header are three input fields labeled 'user name', 'email', and 'password'. At the bottom of the form, there is a box containing the text 'ACTIVATION CODE SN-0012345A-85212FC25-685D-BEBE'.

### HIQ Universe subscription dashboard



You will see tiles for all your subscribed HIQ Universe devices and services.

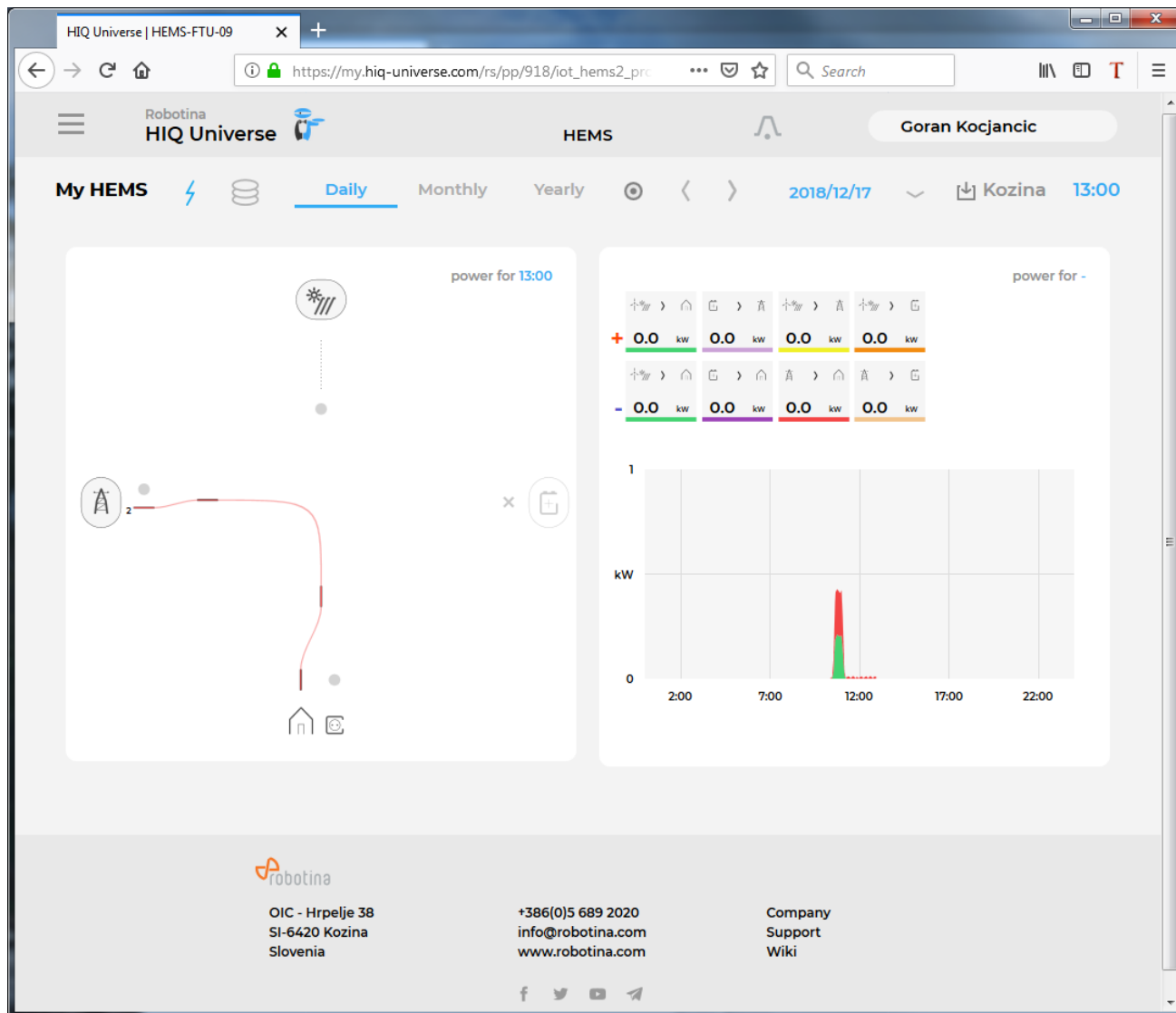
Go to [Main HEMS view](#) by clicking on HEMS tile or

add [new HEMS device](#) by clicking on blank tile with + sign.

["User profile set-up"](#) is invoked by clicking on user name on top right.

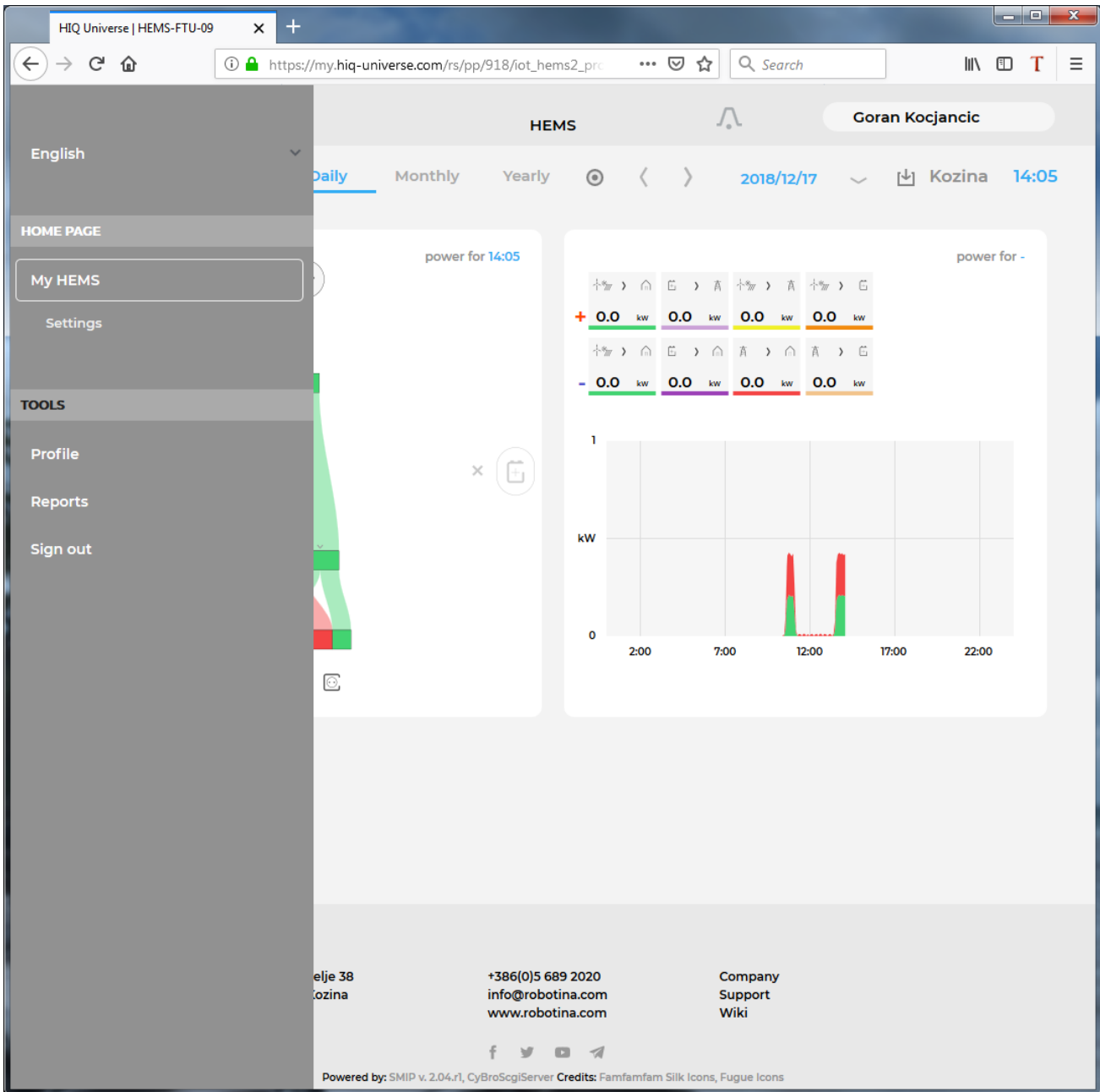
## Main HEMS view





Main HEMS page consists of 3 sections:

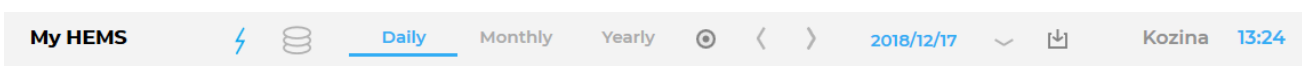
- "Title and view selection row" at the top
- "Power flow chart" on left side
- "Power and energy time-plot" on right



Side menu is activated by clicking menu icon (tree vertical lines at top-left). Menu items are dynamic created so can be different for each user. Typical menu items from top:

- Language selection
- Home page → section with all your subscribed HIQ Universe devices and services
  - MyHems → "Main HEMS view"
    - Settings → "HEMS settings"
- TOOLS → section with general site tools
  - Profile → "User profile set-up"
  - Sign out → Log off from HIQ Universe

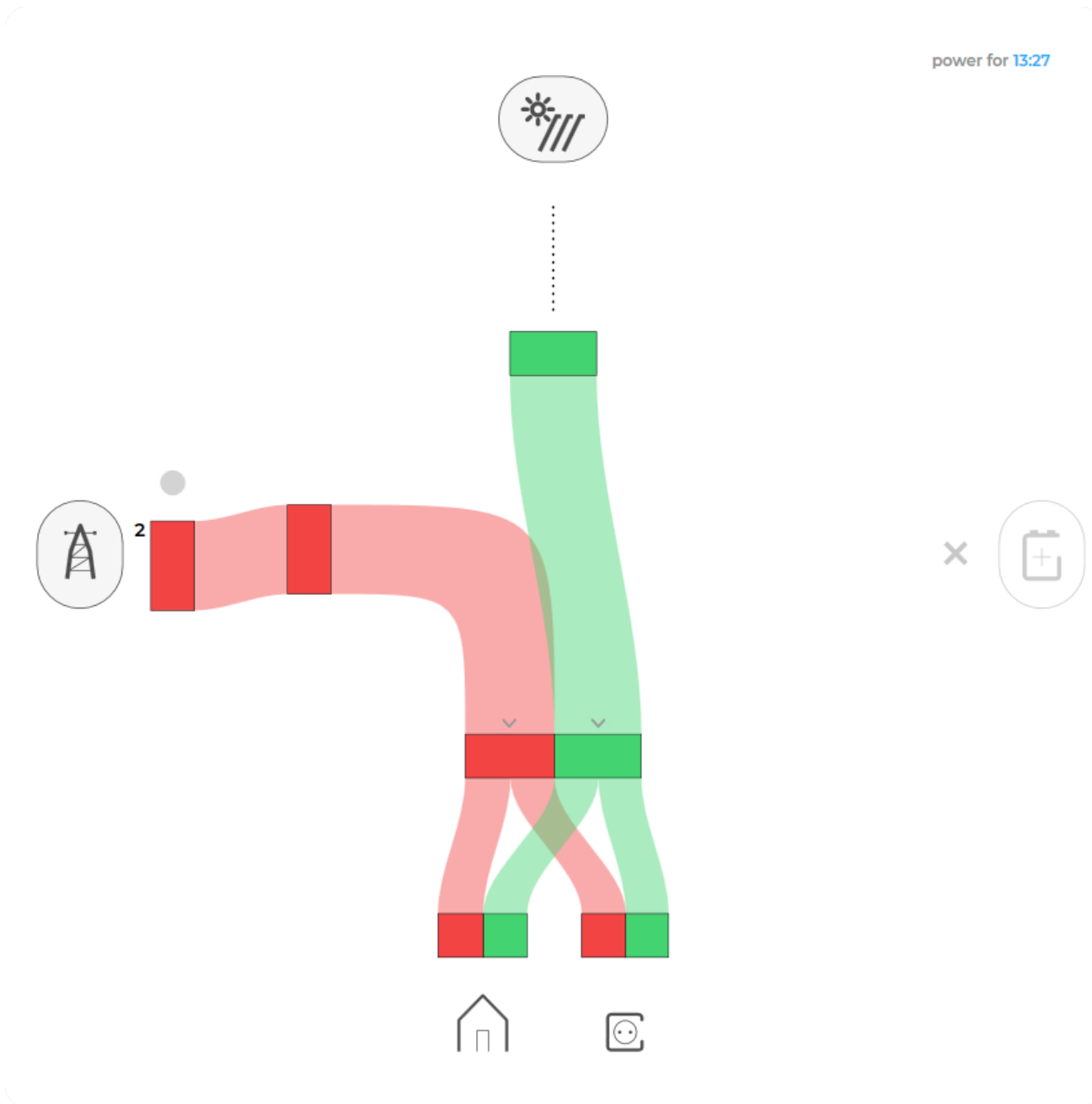
**Title and view selection row**



From the left:

- HEMS name
- Lighting icon → time-plot displays energy or power
- Money icon → time-plot displays currency
- Daily → time-plot displays power
- Monthly → time-plot displays energy per day
- Yearly → time-plot displays energy par month
- Target icon → time-plot go to now
- < → time-plot goes to previous term
- > → time-plot goes to next term
- Date → Select term for time-plot
- Download icon → Download “csv” data for displayed time-plot period
- Location of HEMS installation
- Time at HEMS installation site.

### **Power flow chart**



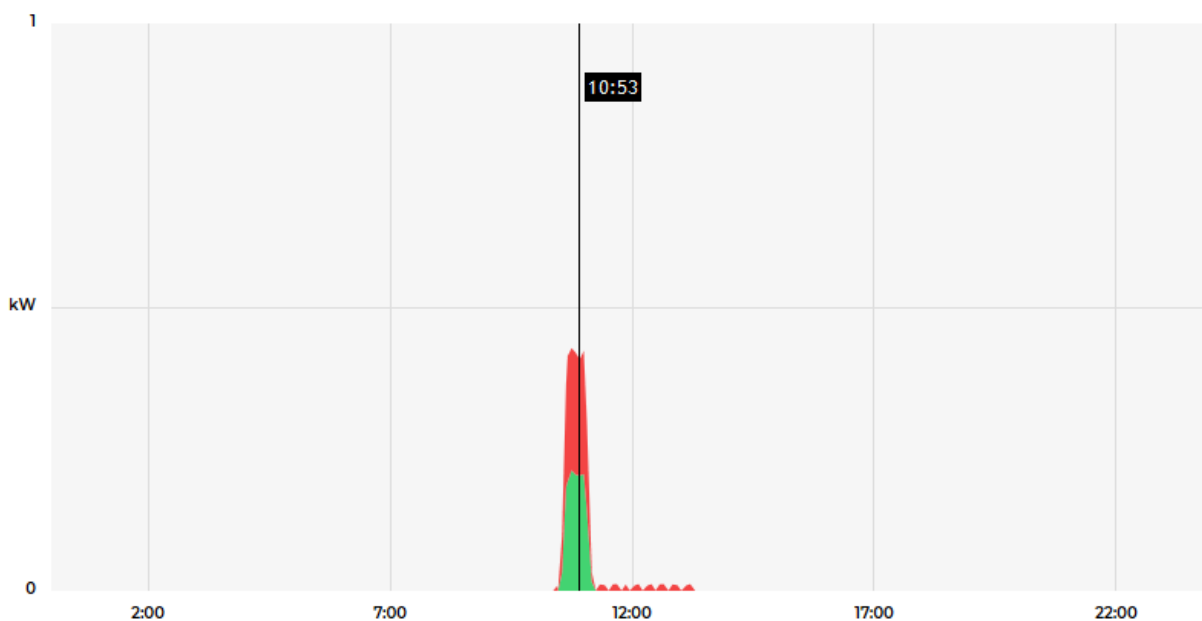
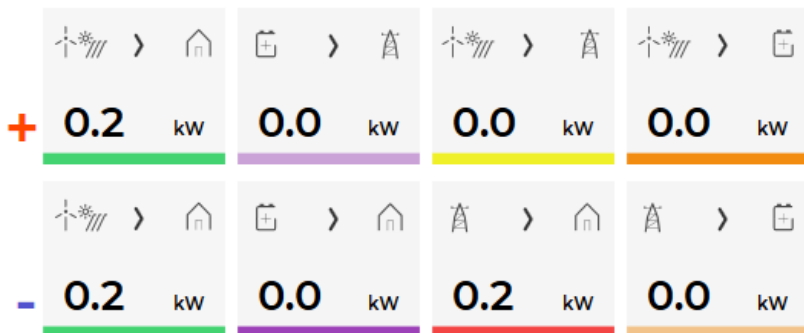
Displays actual power flow with:

- Power sources (Local PV, wind, co-generation plants) at top
- Grid (divided by tariffs) on left side
- Storage (battery) systems on right side and
- Consumers on bottom.

Unused items are soft greyed out with X. Items without actual power are displayed as dots.

### Power and energy time-plot

power for 10:55



On bottom is time-plot for selected time period (in title row). By clicking on time plot a term for legend display is selected. Above there is power/energy legend.

### User profile set-up

The screenshot shows a web browser window with the URL [https://my.hiq-universe.com/rs/sa/user\\_profile/](https://my.hiq-universe.com/rs/sa/user_profile/). The page header includes the 'Robotina HIQ Universe' logo and the user's name 'Goran Kocjancic'. The main content is organized into four sections:

- Basic information:** A table-like view showing user details:
 

Username	username
Created	11/05/2018 01:34:41 PM CET from IP 89.212.246.66
Previous login	12/17/2018 12:31:16 PM CET from IP 89.212.246.66
Last login	12/17/2018 12:48:57 PM CET from IP 89.212.246.66
Last password change	12/17/2018 12:45:50 PM CET from IP 89.212.246.66
- Profile:** A form with four fields:
 

Main realm	HEMS
Full name	Goran Kocjancic
Email address	goran.kocjancic@gmail.com
Timezone	UTC+1:00 Europe/Amsterdam

 Below the fields is a blue 'Save changes' button.
- Foreign realms:** A section with a horizontal line, currently empty.
- Password:** A form with three input fields:
 

Old password	
New password	
Repeat password	

 Below the fields is a blue 'Change password' button.

Basic information section:

- Username
- Created date and IP
- Previous and last login date and IP
- Last password change date and IP

Profile section:

- Main realm display
- Full name, email address and timezone edit fields

Foreign realms - devices and services where you have access to but you are not owner.

Password: fields for password changing.

## HEMS settings

HIQ Universe | Settings

https://my.hiq-universe.com/rs/pp/918/iot\_hems2\_prc

Robotina  
HIQ Universe

Goran Kocjancic

### Settings

Device name: My HEMS

Location: Kozina

Location name: Kozina

Location latitude:

Location longitude:

### Energy price

Low tariff price (€/kWh): 0.100

High tariff price (€/kWh): 0.200

Feed-in tariff price (€/kWh): 0.100

### Timeplots range

Electricity

Max daily power (kW): 1

Max daily energy (kWh): 1

Max monthly energy (kWh): 20

Cost

Max daily value (€): 10

Max monthly value (€): 100

Save settings

### Share your device

Owner: goran.kocjancic@gmail.com

Guest account

Guest email address Remove quest

### Sections:

- Settings:
  - Device name
  - Location name and coordinates
- Energy price: per tariff energy price
- Timeplots range: ranges for various timeplots
- Share your device: manage device sharing guest accounts